ENGLISH

General Safety Instructions:



READ SAFETY INSTRUCTIONS

Servicing:
These products are not customer serviceable TDK-Lambda UK LTD and their authorised agents only are permitted to carry out repairs.

Critical Components:
These products are not authorised for use as critical components in nuclear control systems, life support systems or equipment for use in hazardous environments without the express written approval of the Managing Director of TDK-Lambda EMEA.

Product Usage:
These products are designed for use within a host equipment which restricts access to authorised competent personnel.

This product is a component power supply and is only to be installed by qualified persons within other equipment and must be not operated as a stand alone product.
This product is for sale to business to business customers and can be obtained via distribution channels.
It is not intended for sale to end users.

This product is a component power supply and does not fall within the scope of the EMC directive. Compliance with the EMC directive must be considered in the final installation. Please contact your local TDK-Lambda office.

Environmental:
These products are IPX0, and therefore chemicals/solvents, cleaning agents and other liquids must not be used.

Environment:
This power supply is a switch mode power supply for use in applications within a Pollution Degree 2, overvoltage category II environment. Material Group IIIb PCB's are used within it.

Output Loading:
The output power taken from the power supply must not exceed the rating stated on the power supply label, except as stated in the product limitations in this handbook.

Input Parameters:
This product must be operated within the input parameters stated in the product limitations in this handbook.

End of Life Disposal:
The unit contains components that require special disposal. Make sure that the unit is properly disposed of at the end of its service life and in accordance with local regulations.



RISK OF ELECTRIC SHOCK

High Voltage Warning:
Dangerous voltages are present within the power supply**.** The professional installer must protect service personnel from inadvertent contact with these dangerous voltages in the end equipment.

WARNING: When installed in a Class 1 end equipment, this product must be reliably earthed and professionally installed.

The (+) or (-) output(s) can be earthed or left floating.

The unit cover(s)/chassis (where applicable) must not be made user accessible.

The mains input connector is not acceptable for use as field wiring terminals.

For encased products, do not use mounting screws, which penetrate the unit more than; See drawings.

Internal fuses protect the unit and must not be replaced by the user. In case of internal defect, the unit must be returned to TDK-Lambda UK LTD or one of their authorised agents.

A suitable mechanical, electrical and fire enclosure must be provided by the end use equipment for mechanical, electric shock and fire hazard protection.

The unit cover/chassis, where applicable, is designed to protect skilled personnel from hazards. They must not be used as part of the external covers of any equipment where they may be accessible to operators, since under full load conditions, part or parts of the unit chassis may reach temperatures in excess of those considered safe for operator access.

DEUTSCH

Allgemeine Sicherheitsvorschriften:



LESEN SIE DIE SICHERHEITSVORSCHRIFTEN

Wartung:
Diese Produkte können nicht durch den Kunden gewartet werden. Nur TDK-Lambda UK LTD. und deren zugelassene Vertriebshändler sind zur Durchführung von Reparaturen berechtigt.

Kritische Komponenten:
Diese Produkte sind nicht für die Verwendung als kritische Komponenten in nuklearen Kontrollsystemen, Lebenserhaltungssystemen oder Geräten in gefährlichen Umgebungen geeignet, sofern dies nicht ausdrücklich und in Schriftform durch den Geschäftsführer von TDK-Lambda EMEA genehmigt wurde.

Produktverwendung:
Diese Produkte sind zur Verwendung innerhalb von Host-Anlagen gedacht, die einen auf das Fachpersonal beschränkten Zugang haben.
Dieses Produkt ist eine Stromversorgungs-Komponente und sie darf nur von qualifiziertem Personal in andere Geräte eingebaut werden und sie darf NICHT als eigenständiges ("Stand-Alone") Gerät betrieben werden.
Dieses Produkt ist für den Verkauf an Geschäftskunden entwickelt worden und es kann über Distributionskanäle bezogen werden.
Es ist NICHT für den Verkauf an Endkunden gedacht und konzipiert.

Dieses Produkt ist eine Stromversorgungsbaugruppe und sie fällt NICHT in den Bereich der EMV Direktive.
Die Konformität mit der EMV Richtlinie muss in der finalen Gesamtinstallation betrachtet werden.
Bitte kontaktieren Sie Ihr regionales TDK-Lambda Vertriebsbüro im Falle von Rückfragen.

Umwelt:
Diese Produkte sind IPX0, aus diesem Grund dürfen keine Chemikalien/Lösungsmittel, Reinigungsmittel und andere Flüssigkeiten verwendet werden.

Umgebung:
Dieses Netzteil ist ein Schaltnetzteil zur Verwendung in einer Umgebung mit einem Verschmutzungsgrad 2, Überspannungskategorie II. Materialgruppe IIIb mit darin verwendeten PCBs.

Ausgangsstrom:
Der Ausgangsstrom des Netzteiles darf die Leistung, die auf dem Label des Netzteiles vermerkt ist, nur dann überschreiten, wenn dies in den Produktgrenzen dieses Handbuches ausgezeichnet ist.

Eingangsparameter:
Dieses Produkt muss innerhalb der Eingangsparameter, die in den Produktgrenzen dieses Handbuches angegeben sind, betrieben werden.

Entsorgung am Ende der Betriebszeit:
Das Gerät enthält Komponenten die unter Sondermüll fallen. Das Gerät muss am Ende der Betriebszeit ordnungsgemäß und in Übereinstimmung mit den regionalen Bestimmungen entsorgt werden.



GEFAHR DURCH ELEKTRISCHEN SCHLAG

Hochspannungswarnung:
Innerhalb des Netzteiles gibt es gefährliche Spannungen**.** Der Elektroinstallateur muss das Wartungspersonal vor versehentlichem Kontakt mit den gefährlichen Spannungen im Endgerät schützen.

WARNUNG! Falls Sie unser Netzgerät in eine Anwendung mit Schutzklasse 1 eingebaut haben, stellen Sie sicher, dass es fachgerecht installiert und zuverlässig geerdet ist.

Die (+) oder (-) Ausgänge können geerdet werden oder unangeschlossen bleiben.

Die Abdeckung des Gerätes/das Gehäuse darf für den Benutzer nicht zugänglich sein.

Der Haupteingangsanschluss ist nicht für die Verwendung als Feldverdrahtungsanschluss geeignet.

Für ummantelt Produkte, verwenden Sie keine Schrauben, die das Gerät mehr als durchdringen; siehe Zeichnung
Eine interne Sicherung schützt das Gerät und darf durch den Benutzer nicht ausgetauscht werden. Im Fall von internen Defekten muss das Gerät an TDK-Lambda UK LTD oder einen der autorisierten Vertriebshändler zurückgeschickt werden.

Ein geeignetes mechanisches, elektrisches und brandgeschütztes Gehäuse muss als Schutz vor der Gefahr von mechanischen Risiken, Stromschlägen und Brandschutz in dem Endgerät vorgesehen werden.

Die Geräteabdeckung/das Gehäuse ist so entworfen, dass das Fachpersonal vor Gefahren geschützt wird. Sie dürfen nicht als Teil der externen Abdeckung für Geräte verwendet werden, die für den Betreiber zugänglich sein müssen, da Teile oder das gesamte Gerätegehäuse unter voller Auslastung übermäßige Temperaturen erreichen kann, die für den Zugang des Betreibers nicht mehr als sicher betrachtet werden.

FRANÇAIS

Consignes générales de sécurité:



LIRE LES CONSIGNES DE SECURITE

Entretien:
Ces produits ne peuvent pas être réparés par l'utilisateur. Seuls, TDK-Lambda UK LTD et ses agents agréés sont autorisés à effectuer des réparations.

Composants critiques:
Ces produits ne doivent pas être utilisés en tant que composants critiques dans des systèmes de commande nucléaire, dans des systèmes de sauvetage ou dans des équipements utilisés dans des environnements dangereux, sans l'autorisation écrite expresse du directeur général de TDK-Lambda EMEA.

Utilisation du produit:
Ces produits sont conçus pour être utilisés dans un équipement hôte dont l'accès n'est autorisé qu'aux personnes compétentes.
Ce produit est une alimentation considérée comme un composant devant être installé par des personnes qualifiées, dans un autre équipement. Il ne doit pas être utilisé en tant que produit fini.
Ce produit est destiné à la vente entre entreprises et peut être obtenu via des canaux de distribution.
Il n'est pas prévu à la vente pour les particuliers.

Ce produit est une alimentation considérée comme un composant, il ne relève pas du champ d'application de la directive CEM. Le respect de la directive CEM doit être pris en compte dans l'installation finale. Veuillez contacter votre bureau TDK-Lambda le plus proche.

Environnement:
Ces produits sont IPX0, et donc on ne doit pas utiliser des produits chimiques/solvants, des produits de nettoyage et d'autres liquides.

Environnement fonctionnel :
Cette alimentation fonctionne en mode commutation pour utilisation dans des applications fonctionnant dans un environnement avec Degré de Pollution 2 et catégorie de surtension II. Elle utilise des cartes des circuits imprimés (PCB) de Groupe IIIb.

Intensité soutirée:
L'intensité soutirée de l'alimentation ne doit pas dépasser l'intensité nominale marquée sur la plaque signalétique, sauf indications contraires dans les limitations du produit décrit dans ce manuel.

Paramètres d'entrée:
Ce produit doit être utilisé à l'intérieur des paramètres d'entrée indiqués dans les limitations du produit dans ce manuel.

Elimination en fin de vie:
L'alimentation contient des composants nécessitant des dispositions spéciales pour leur élimination. Vérifiez que cette alimentation est mise au rebut correctement en fin de vie utile et conformément aux réglementations locales en vigueur.



RISQUE DE CHOC ELECTRIQUE

Attention-Danger haute tension:
Des tensions dangereuses sont présentes dans l'alimentation. L'installateur doit protéger le personnel d'entretien contre un contact involontaire avec ces tensions dangereuses dans l'équipement final.

AVERTISSEMENT: Si ce produit est installé dans un équipement final de classe I, il doit être mis à la terre de manière fiable et installé par un professionnel averti.

Les sorties (+) ou (-) peuvent être raccordées à la terre ou laissées flotttantes.

Le couvercle/châssis de l'alimentation ne doit pas être accessible à l'utilisateur.Le connecteur d'entrée d'alimentation principale ne doit pas être utilisé comme borne de raccordement.

N'utilisez pas de vis pénétrant dans le module sur une profondeur supérieure à :Voir dessins.

Un fusible interne protège le module et ne doit pas être remplacé par l'utilisateur. En cas de défaut interne, le module doit être renvoyé à TDK-Lambda UK LTD ou l'un de ses agents agréés.

Une enceinte appropriée doit être prévue par l'utilisateur final pour assurer la protection contre les chocs mécaniques, les chocs électriques et l'incendie.

Le couvercle et le châssis du module sont conçus pour protéger des personnels expérimentés. Ils ne doivent pas être utilisés comme couvercles extérieurs d'un équipement, accessible aux opérateurs car en condition de puissance maximum, des parties du châssis peuvent atteindre des températures considérées comme dangereuses pour l'opérateur.

ITALIANO

Norme generali di sicurezza:



SI PREGA DI LEGGERE LE NORME DI SICUREZZA

Manutenzione:
Il cliente non può eseguire alcuna manutenzione su questi prodotti. L'esecuzione delle eventuali riparazioni è consentita solo a TDK-Lambda UK LTD e ai suoi agenti autorizzati.

Componenti critici:
Non si autorizza l'uso di questi prodotti come componenti critici all'interno di sistemi di controllo nucleari, sistemi necessari alla sopravvivenza o apparecchiature destinate all'impiego in ambienti pericolosi, senza l'esplicita approvazione scritta dell'Amministratore Delegato di TDK-Lambda EMEA.

Uso dei prodotti:
Questi prodotti sono progettati per l'uso all'interno di un'apparecchiatura ospite che limiti l'accesso al solo personale competente e autorizzato.
Questo prodotto è da considerarsi come un alimentatore professionale componente e come tale deve essere installato da personale qualificato all'interno di altre apparecchiature e non può essere utilizzato come prodotto indipendente.
Questo prodotto non è inteso per la vendita al dettaglio o agli utilizzatori finali.

Questo alimentatore è da considerarsi come un componente e come tale non è assogettato dagli scopi della direttiva EMC. Conformità alla direttiva EMC deve essere considerata nell'installazione finale di utilizzo. Gli uffici di TDK-Lambda Sas Succursale Italiana sono a vostra disposizione per ulteriori ragguagli.

Condizioni ambientali:
Questi prodotti sono classificati come IPX0, dunque non devono essere utilizzati sostanze chimiche/solventi, prodotti per la pulizia o liquidi di altra natura.

Ambiente:
Questo prodotto è un alimentatore a commutazione, destinato all'uso in applicazioni rientranti in ambienti con le seguenti caratteristiche: Livello inquinamento 2, Categoria sovratensione II. Questo prodotto contiene schede di circuiti stampati in materiali di Gruppo IIIb.

Carico in uscita:
La potenza in uscita ottenuta dall'alimentatore non deve superare la potenza nominale indicata sulla targhetta dell'alimentatore, fatto salvo dove indicato nei limiti per i prodotto specificati in questo manuale.

Parametri di alimentazione:
Questo prodotto deve essere utilizzato entro i parametri di alimentazione indicati nei limiti per il prodotto, specificati in questo manuale.

Smaltimento:
L'unità contiene componenti che richiedono procedure speciali di smaltimento. Accertarsi che l'unità venga smaltita in modo corretto al termine della vita utile e nel rispetto delle normative locali.



RISCHIO DI SCOSSA ELETTRICA

Avvertimento di alta tensione:
All'interno dell'alimentatore sono presenti tensioni pericolose. Gli installatori professionali devono proteggere il personale di manutenzione dal rischio di contatto accidentale con queste tensioni pericolose all'interno dell'apparecchiatura finale.

ATTENZIONE: Se installato in un'attrezzatura di classe I, questo prodotto deve essere collegato a terra in modo affidabile ed installato in modo professionale.

Le uscite (+) o (-) possono essere messa a terra o lasciate isolate.

I coperchi/il telaio dell'unità non devono essere accessibili da parte dell'utente.

Il connettore dell'alimentazione principale non può essere utilizzato come terminale di collegamento di campo.

Non utilizzare viti che penetrano nell'unità per più di : Vedi disegni

Un fusibile interno protegge l'unità e non deve essere sostituito dall'utente. Nell'eventualità di un difetto interno, restituire l'unità a TDK-Lambda UK LTD o a uno dei suoi agenti autorizzati.

L'apparecchiatura finale deve includere una recinzione meccanica, elettrica e antincendio per proteggere dai pericoli di natura meccanica, dalle scosse elettriche e dai pericoli di incendio.

Il coperchio/telaio dell'unità è realizzato per proteggere il personale esperto dai pericoli. Non deve essere usato come parte degli involucri esterni di qualsiasi apparecchiatura, se risulta accessibile da parte degli addetti, poiché è possibile che in condizioni di pieno carico una o più parti del telaio dell'unità giunga/giungano a temperature superiori ai limiti considerati sicuri per l'accesso da parte degli addetti.

ESPAÑOL

Instrucciones generales de seguridad:



LEA LAS INSTRUCCIONES DE SEGURIDAD

Servicio:
Estos productos no pueden ser reparados por los clientes. TDK-Lambda UK LTD. y sus agentes autorizados son los únicos que pueden llevar a cabo las reparaciones.

Componentes fundamentales:
Estos productos no pueden ser utilizados como componentes fundamentales en sistemas de control nuclear, sistemas de soporte vital o equipos a utilizar en entornos peligrosos sin el consentimiento expreso por escrito del Director General de TDK-Lambda EMEA.

Uso de los productos:
Estos productos han sido diseñados para ser utilizados en un equipo central que restrinja el acceso al personal cualificado autorizado.
Este producto es una fuente de alimentación y sólo puede ser instalado por personal cualificado dentro de otros equipos y no debe ser tratado como un producto independiente. Este producto debe ser vendido entre empresas profesionales y solo puede obtenerse a través de los canales de distribución .No está destinado para la venta a usuarios finales

Este producto es una fuente de alimentación y no se ve afectada por la directiva EMC . El cumplimiento de la directiva EMC se debe considerar en la instalación final. Por favor, póngase en contacto con su oficina local de TDK – Lambda.

Medioambiental:
Estos productos son IPX0 y, por tanto, no pueden utilizarse sustancias químicas/disolventes, agentes de limpieza ni otros líquidos.

Medio ambiente:
Esta fuente de alimentación es una fuente de alimentación de modo conmutado a utilizar en aplicaciones dentro de un entorno con un Grado de contaminación 2 y una Categoría de sobretensión II. En él se utilizan policloruros de bifenilo del Grupo de materiales IIIb.

Carga de salida:
La potencia de salida tomada de la fuente de alimentación no puede sobrepasar el valor nominal indicado en la etiqueta de la fuente de alimentación, excepto en los casos indicados en las limitaciones del producto en este manual.

Parámetros de entrada:
Este producto debe ser utilizado dentro de los parámetros de entrada indicados en las limitaciones del producto en este manual.

Desecho de la unidad:
La unidad contiene componentes que deben ser desechados de una manera especial. Asegúrese de desechar correctamente la unidad al final de su vida útil y conforme a las normas locales vigentes.



PELIGRO DE DESCARGAS ELÉCTRICAS

Advertencia de alta tensión:
En esta fuente de alimentación hay tensiones peligrosas. El instalador profesional debe proteger al personal de servicio contra cualquier contacto accidental con estas tensiones peligrosas en el equipo final.

ADVERTENCIA: La instalación de este producto en un equipo de clase I la deben llevar a cabo profesionales y el producto debe estar conectado a tierra.

La salida o salidas (+) o (-) pueden conectarse a tierra o se las puede dejar flotando.

Debe impedirse el acceso de los usuarios a la cubierta o cubiertas y al chasis de la unidad.

El conector de entrada de la red no es apto para ser utilizado a modo de bornes de cableado de campo.

No utilice tornillos de montaje susceptibles de penetrar en la unidad más de: Ver dibujos.

Un fusible interno protege la unidad y este no debe ser nunca reemplazado por el usuario. En caso de existir algún defecto interno, la unidad debe ser enviada a TDK-Lambda UK LTD o a uno de sus agentes autorizados.

El equipo de uso final debe constituir un recinto de protección mecánica, eléctrica y contra incendios de protección mecánica, contra descargas eléctricas y contra el peligro de incendios.

La cubierta/chasis de la unidad ha sido diseñada para que proteja a las personas cualificadas de los peligros. No deben ser utilizadas como parte de las cubiertas externas de cualquier equipo al que pueden acceder los operarios, ya que bajo unas condiciones de carga completa, la pieza o piezas del chasis de la unidad pueden alcanzar temperaturas superiores a las consideradas seguras para el acceso de los operarios.

PORTUGUÊS

Instruções gerais de segurança:



LEIA AS INSTRUÇÕES DE SEGURANÇA

Manutenção:
Estes produtos não são podem ser submetidos a manutenção por parte do cliente. Apenas a TDK-Lambda UK LTD e os seus agentes autorizados têm permissão para realizar reparações.

Componentes essenciais:
Não é autorizada a utilização destes produtos como componentes essenciais de sistemas de controlo nuclear, sistemas de suporte de vida ou equipamento para utilização em ambientes perigosos sem a expressa autorização por escrito do Director-Geral da TDK-Lambda EMEA.

Utilização do produto:
Estes produtos foram concebidos para utilização dentro de um equipamento de alojamento que apenas permita o acesso a pessoal qualificado autorizado.
Este produto é uma alimentaçao considerado com um componente para ser instalado por pessoas qualificadas, em outros equipamentos. Não deve ser usado como um produto acabado.
Este produto é destinado para venda entre as empresas e pode ser obtido através de canais de distribuição.
Não se destina à venda aos particulares.

Este produto é uma alimentaçao considerado com um componente, não é dentro do appliquation âmbito da directiva CEM.
Conformidade com a directiva CEM devem ser considerados na instalação final.
Entre em contacto com seu escritório TDK-Lambda mais próximo.

Ambiental:
Estes produtos são IPX0 e, como tal, não se devem utilizar químicos/solventes, agentes de limpeza e outros líquidos.

Ambiente:
Esta fonte de alimentação é uma fonte de alimentação do modo de comutação para utilização em aplicações com um Nível de Poluição 2 e ambientes da categoria de sobretensão II. São utilizadas placas de circuitos impressos do grupo de materiais IIIb.

Carga de saída:
A potência de saída extraída da fonte de alimentação não deve exceder a classificação assinalada na etiqueta da fonte de alimentação, excepto quando indicado nas limitações do produto neste guia.

Parâmetros de entrada:
Este produto deve ser utilizado dentro dos parâmetros de entrada indicados nas limitações do produto neste guia.

Eliminação no fim de vida:
A unidade contém componentes que necessitam de procedimentos especiais de eliminação. Certifique-se de que a unidade é devidamente eliminada no fim da sua vida útil e que tal é feito em conformidade com os regulamentos locais.



RISCO DE CHOQUE ELÉCTRICO

Aviso de alta tensão:
Estão presentes tensões perigosas dentro da fonte de alimentação. O profissional que realizar a instalação deve proteger o pessoal de assistência contra contactos inadvertidos com estas tensões perigosas do equipamento final.

AVISO: Quando instalado num equipamento de Classe I, este produto deve ser ligado à terra de forma fiável e instalado por um profissional.
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As saídas (+) e (-) podem ser ligadas à terra ou deixadas soltas.

O chassis/cobertura(s) da unidade não deve estar acessível ao utilizador.

O conector de entrada de alimentação não deve ser utilizado como terminal de cablagens no local.

Não utilize parafusos de montagem, uma vez que estes penetrarão na unidade em mais do que: Veja os desenhos

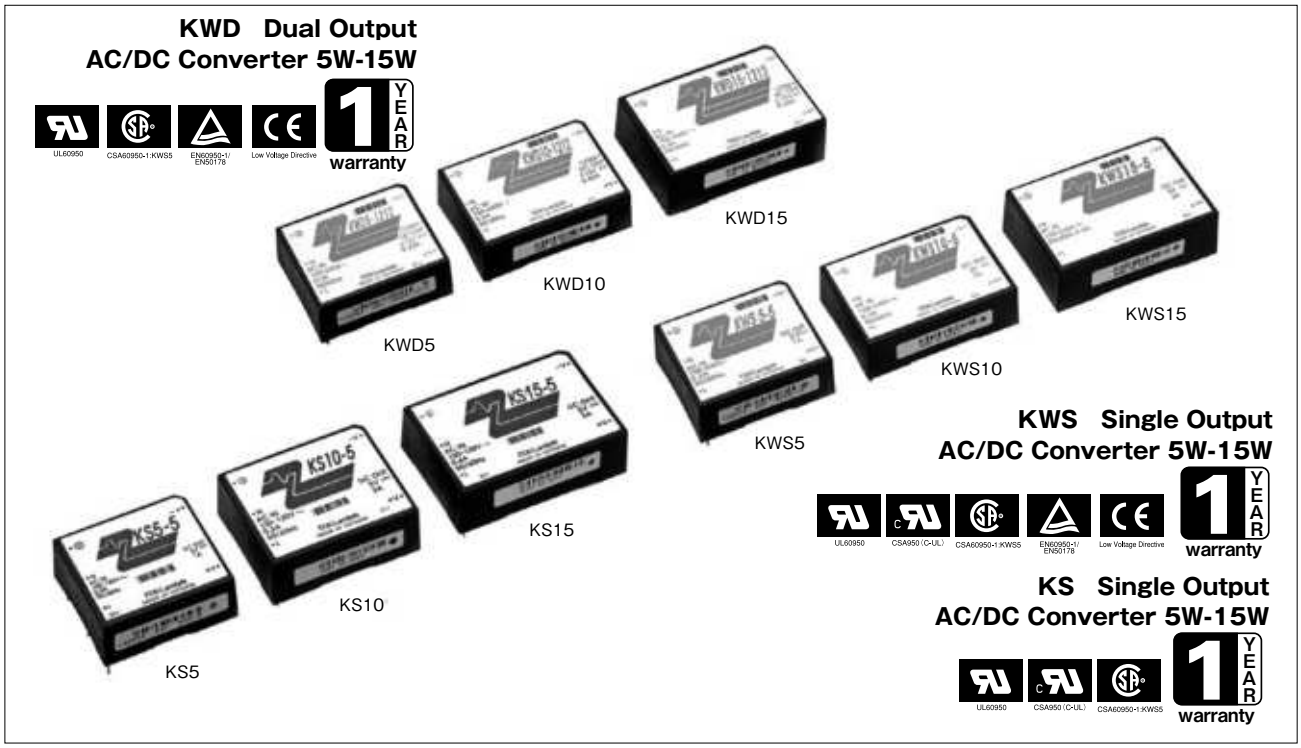
Existe um fusível interno que protege a unidade e que não deve ser substituído pelo utilizador. Em caso de defeito interno, a unidade deve ser devolvida à TDK-Lambda UK LTD ou a um dos seus agentes autorizados.

O equipamento de utilização final deve fornecer um bastidor com protecção mecânica, eléctrica e contra incêndios adequada.

O chassis/cobertura da unidade está concebido de forma a proteger o pessoal especializado de perigos. Não devem ser utilizados como parte das coberturas externas de qualquer equipamento em que possam estar acessíveis aos operadores, uma vez que em condições de carga máxima, algumas peças do chassis da unidade podem atingir temperaturas superiores às consideradas seguras para o acesso do operador.

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KS/KWS/KWD SERIES



■ Features

- On board type AC/DC converter, making full use of SMT technology, and reduction in size and weight is pursued.
- Functions of over current protection (OCP) and over voltage protection (OVP) equipped.
- AC100Vin and single-output type (KS series)
- Worldwide-applicable input and single output (KWS series)
- Worldwide-applicable input and dual output (KWD series)
- Internal capacitor: Aluminum electrolytic (input smoothing), organic semiconductor electrolytic (output smoothing), ceramic

■ Model naming method

KS 5 – 5

Output voltage	5VDC, 12VDC
Output power	5W, 10W, 15W
Series name	KS, KWS, KWD

■ Applications



■ Conformity to RoHS Directive

This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

■ Product Line up

KS (Single output, AC100Vin)

Output Voltage	5W		10W		15W	
	Output Current	Model	Output Current	Model	Output Current	Model
5V	1.0A	KS5-5	2.0A	KS10-5	3.0A	KS15-5
12V	0.45A	KS5-12	0.9A	KS10-12	1.3A	KS15-12

KWS (Single output, AC100/200Vin)

Output Voltage	5W		10W		15W	
	Output Current	Model	Output Current	Model	Output Current	Model
5V	1.0A	KWS5-5	2.0A	KWS10-5	3.0A	KWS15-5
12V	0.45A	KWS5-12	0.9A	KWS10-12	1.3A	KWS15-12
15V	0.35A	KWS5-15	0.7A	KWS10-15	1A	KWS15-15

KWD (Dual output, AC100/200Vin)

Output Voltage	5W		10W		15W	
	Output Current	Model	Output Current	Model	Output Current	Model
±12V	0.22A	KWD5-1212	0.45A	KWD10-1212	0.65A	KWD15-1212
±15V	0.18A	KWD5-1515	0.36A	KWD10-1515	0.52A	KWD15-1515

・All specifications are subject to change without notice.

KS5 Specifications

ITEMS/UNITS \ MODEL			KS5-5	KS5-12
Input	Voltage Range (*2)	V	AC85 - 132 or DC110 - 175	
	Frequency (*2)	Hz	47 - 440Hz	
	Efficiency (typ) (*1)	%	67	69
	Current (100VAC)(typ) (*1)	A	0.2	
	Inrush Current (100VAC)(typ)	A	15 at Ta = 25℃	
Output	Nominal Voltage	VDC	5	12
	Minimum Current	A	0	
	Maximum Current	A	1.0	0.45
	Maximum Power	W	5.0	5.4
	Voltage Setting Accuracy		Fixed ±5% (Max)	
	Maximum Line Regulation (*3)(*4)	mV	20	48
	Maximum Load Regulation (*3)(*5)	mV	40	96
	Temperature Coefficient (*3)(*6)		50	120
	Maximum Ripple & Noise (*3)	mVp-p	120	150
	Hold-up Time (100VAC)(typ)	ms	17 at 5W, Ta = 25℃	
Function	Over Current Protection (*7)		>105%	
	Over Voltage Protection (*8)		>110%	
	Parallel Operation		No	
	Series Operation		Yes	
Environment	Operating Temperature	℃	-10 to 70 (-10 : 80%, 0 to 50 : 100%, 70 : 25%)	
	Storage Temperature	℃	-30 to 85	
	Operating Humidity	%RH	30 - 90 (No dewdrop)	
	Storage Humidity	%RH	20 - 95 (No dewdrop)	
	Vibration		10 - 55Hz, constant amplitude 1.65mmp-p (Max98.1m/s^2), sweep 1 minute X, Y, Z 1 hour each	
	Shock		Less than 490.3m/s^2 for 11±5ms on ±(X, Y, Z) axis each 3 times	
	Cooling		Convection cooling	
Isolation	Withstand Voltage		Input - Output : 2kVAC(20mA), Input - FG : 2kVAC(20mA) Output - FG : 500VAC(100mA) for 1 minute each	
	Isolation Resistance		More than 100MΩ at 25℃ and 70%RH, Output - FG 500VDC	
Standards	Safety Standards		Approved by UL60950 - 1 & CSA C22.2 No.60950-1, Built to meet DENAN	
	EMI		Built to meet VCCI - Class A & FCC class B	
Mechanical	Weight	g	70	
	Size (W x H x D)	mm	43 x 19.5 x 48	

(*1) At 100VAC and maximum output power, Ta = 25℃.

(*2) For cases where conformance to various safety specs (UL, CSA) are required, to be described as 100 - 120VAC, 50/60Hz on name plate.

(*3) Please refer to Fig. A for measurement determination of line & load regulation and output ripple & noise voltage.

(*4) From 85 - 132VAC, constant load.

(*5) From min load - full load (maximum power), constant input voltage.

(*6) From 0 to 50℃, constant input voltage and load.

(*7) Current limiting with automatic recovery. Avoid to operate over load or dead short for more than 30 seconds.

(*8) Over voltage clamping by zener diode.

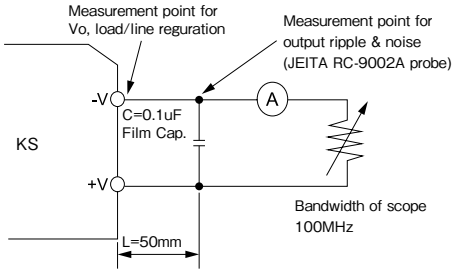
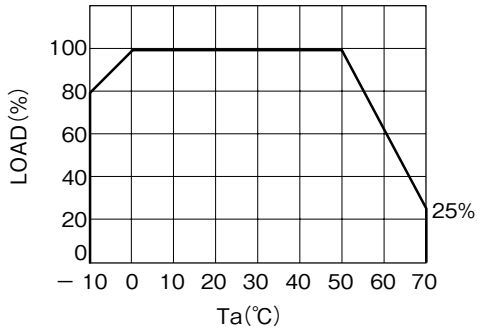


Fig.A

Output Derating



· All specifications are subject to change without notice.

KS10 Specifications

ITEMS/UNITS		MODEL	KS10-5	KS10-12
Input	Voltage Range (*2)	V	AC85 - 132 or DC110 - 175	
	Frequency (*2)	Hz	47 - 440Hz	
	Efficiency (typ) (*1)	%	73	74
	Current (100VAC)(typ) (*1)	A	0.3	
	Inrush Current (100VAC)(typ)	A	10 at Ta = 25℃, cold start	
Output	Nominal Voltage	VDC	5	12
	Minimum Current	A	0	
	Maximum Current	A	2.0	0.9
	Maximum Power	W	10.0	10.8
	Voltage Setting Accuracy	%	Fixed ±5% (Max)	
	Maximum Line Regulation(*3)(*4)	mV	20	48
	Maximum Load Regulation (*3)(*5)	mV	40	96
	Temperature Coefficient(*3)(*6)		50	120
	Maximum Ripple & Noise (*3)	mVp-p	120	150
	Hold-up Time (100VAC)(typ)	ms	17 at 10W, Ta = 25℃	
Function	Over Current Protection (*7)		>105%	
	Over Voltage Protection (*8)		>110%	
	Parallel Operation		No	
	Series Operation		Yes	
Environment	Operating Temperature	℃	-10 to 70 (-10 : 80%, 0 to 50 : 100%, 70 : 25%)	
	Storage Temperature	℃	-30 to 85	
	Operating Humidity	%RH	30 - 90 (No dewdrop)	
	Storage Humidity	%RH	20 - 95 (No dewdrop)	
	Vibration		10 - 55Hz, constant amplitude 1.65mmp-p (max 98.1m/s²), sweep 1 minute X, Y, Z 1 hour each	
	Shock		Less than 490.3m/s² for 11±5mS on ±(X, Y, Z) axis each 3 times	
	Cooling		Convection cooling	
Isolation	Withstand Voltage		Input - Output : 2kVAC (20mA), Input - FG : 2kVAC (20mA) Output - FG : 500VAC (100mA) for 1 minute each	
	Isolation Resistance		More than 100MΩ at 25℃ and 70%RH Output - FG 500VDC	
Standards	Safety Standards		Approved by UL60950 - 1 & CSA C22.2 No.60950-1, Built to meet DENAN	
	EMI		Built to meet VCCI - Class A & FCC class B	
Mechanical	Weight	g	85	
	Size (W x H x D)	mm	45 x 20.5 x 55	

(*1) At 100VAC and maximum output power, Ta = 25℃.

(*2) For cases where conformance to various safety specs (UL, CSA) are required, to be described as 100 - 120VAC, 50/60Hz on name plate.

(*3) Please refer to Fig. A for measurement determination of line & load regulation and output ripple & noise voltage.

(*4) From 85 - 132VAC, constant load.

(*5) From min load - full load (maximum power), constant input voltage.

(*6) From 0 to +50℃, constant input voltage and load.

(*7) Current limiting with automatic recovery. Avoid to operate over load or dead short for more than 30 seconds.

(*8) Over voltage clamping by zener diode.

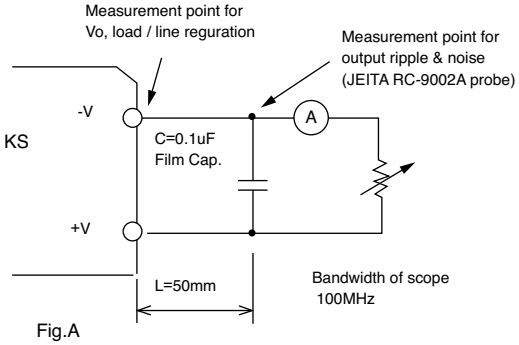
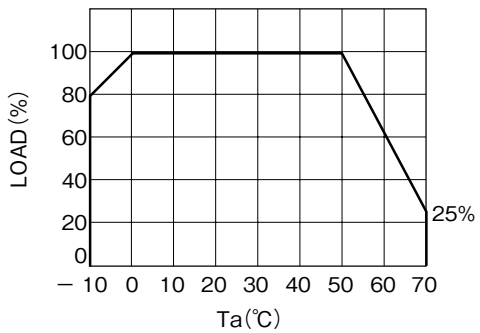


Fig.A

Output Derating



KS15 Specifications

ITEMS/UNITS \ MODEL			KS15-5	KS15-12
Input	Voltage Range (*2)	V	AC85 - 132 or DC110 - 175	
	Frequency (*2)	Hz	47 - 440	
	Efficiency (typ) (*1)	%	74	76
	Current (100VAC)(typ) (*1)	A	0.4	
	Inrush Current (100VAC)(typ)	A	10 at Ta = 25℃, cold start	
Output	Nominal Voltage	VDC	5	12
	Minimum Current	A	0	
	Maximum Current	A	3.0	1.3
	Maximum Power	W	15.0	15.6
	Voltage Setting Accuracy	%	Fixed ± 5% (Max)	
	Maximum Line Regulation(*3)(*4)	mV	20	48
	Maximum Load Regulation (*3)(*5)	mV	40	96
	Temperature Coefficient(*3)(*6)	mV	50	120
	Maximum Ripple & Noise (*3)	mVp-p	120	150
	Hold-up Time (100VAC)(typ)	ms	17 at 15W, Ta = 25℃	
Function	Over Current Protection (*7)		>105%	
	Over Voltage Protection (*8)		>110%	
	Parallel Operation		No	
	Series Operation		Yes	
Environment	Operating Temperature (*9)	℃	-10 to 70 (-10 : 80%, 0 to 50 : 100%, 70 : 25%)	
	Storage Temperature	℃	-30 to 85	
	Operating Humidity	%RH	30 - 90 (No dewdrop)	
	Storage Humidity	%RH	20 - 95 (No dewdrop)	
	Vibration (*10)		10 - 55Hz, constant amplitude 1.65mmp-p (Max 98.1m/s²), sweep 1 minute X, Y, Z 1 hour each	
	Shock		Less than 490.3m/s² for 11±5mS on ±(X, Y, Z) axis each 3 times	
	Cooling		Convection cooling	
Isolation	Withstand Voltage		Input - Output : 2kVAC (20mA), Input - FG : 2kVAC (20mA) Output - FG : 500VAC (100mA) for 1minute each	
	Isolation Resistance		More than 100MΩ at 25℃ and 70%RH Output - FG 500VDC	
Standards	Safety Standards		Approved by UL60950 - 1 & CSA C22.2 No.60950-1, Built to meet DENAN	
	EMI		Built to meet VCCI-Class A & FCC class B	
Mechanical	Weight	g	100	
	Size (W x H x D)	mm	45 x 20.5 x 64	

(*1) At 100VAC and maximum output power, Ta = 25℃.

(*2) For cases where conformance to various safety specs (UL, CSA) are required to be described as 100 - 120VAC, 50/60Hz on name plate.

(*3) Please refer to Fig. A for measurement determination of line & load regulation and output ripple & noise voltage.

(*4) From 85 - 132VAC or 110 - 175VDC, constant load.

(*5) From min load - full load (maximum power), constant input voltage.

(*6) From 0 to +50℃, constant input voltage and load.

(*7) Current limiting with automatic recovery. Avioid to operate over load or dead short for more than 30 seconds.

(*8) Over voltage clamping by zener diode.

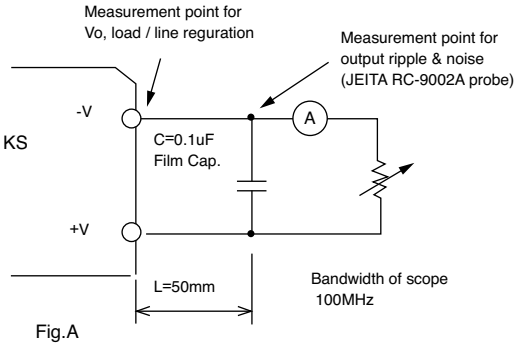
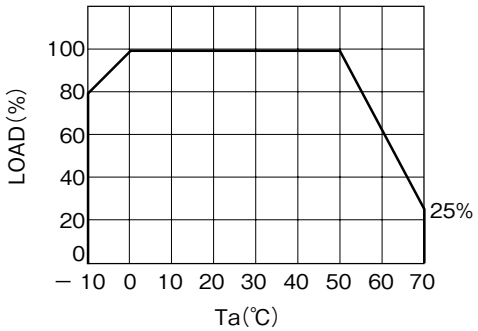


Fig.A

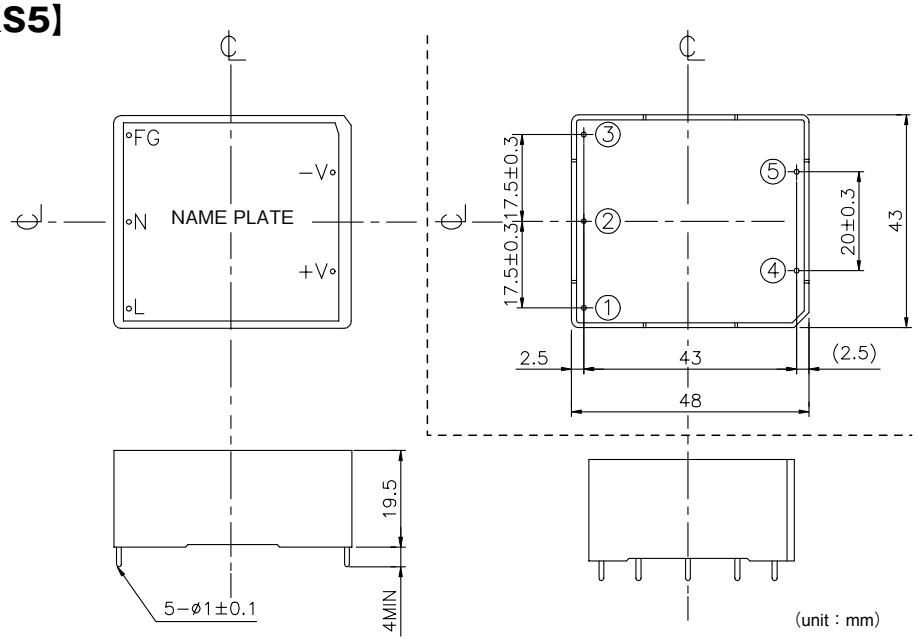
Output Derating



· All specifications are subject to change without notice.

Outline Drawing

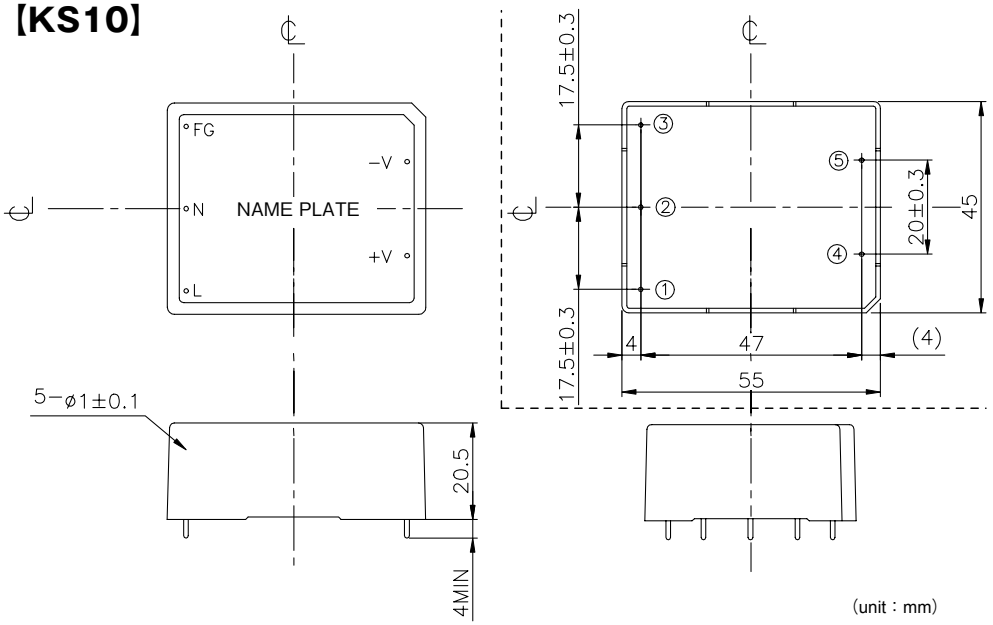
【KS5】



(unit：mm)

*TERMINAL ASSIGNMENTS
①…FG
②…AC(N)] INPUT
③…AC(L)]
④…−V] OUTPUT
⑤…+V]
*MATERIAL
CASE：PLASTIC (UL94V-0)

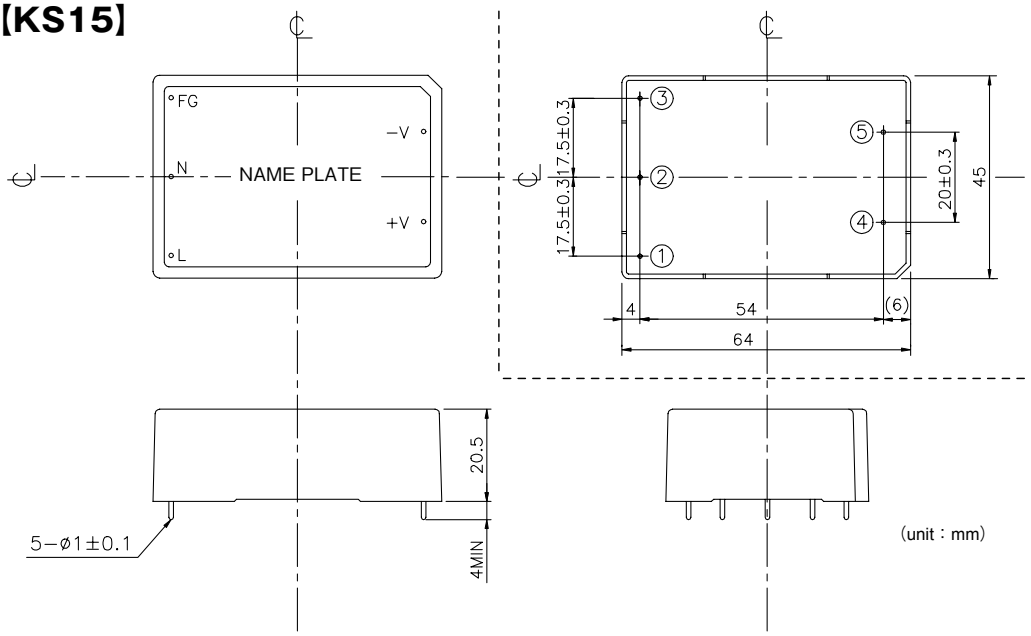
【KS10】



(unit：mm)

*TERMINAL ASSIGNMENTS
①…FG
②…AC(N)] INPUT
③…AC(L)]
④…−V] OUTPUT
⑤…+V]
*MATERIAL
CASE：PLASTIC (UL94V-0)

【KS15】



(unit：mm)

*TERMINAL ASSIGNMENTS
①…FG
②…AC(N)] INPUT
③…AC(L)]
④…−V] OUTPUT
⑤…+V]
*MATERIAL
CASE：PLASTIC (UL94V-0)

・All specifications are subject to change without notice.

KWS5 Specifications

ITEMS/UNITS \ MODEL			KWS5-5	KWS5-12	KWS5-15
Input	Voltage Range (*2)	V	AC85 - 265 or DC110 - 340		
	Frequency (*2)	Hz	47 - 440		
	Efficiency (typ) (*1)	%	67	70	
	Current (100VAC)(typ) (*1)	A	0.2		
	Inrush Current (100/200VAC)(typ)	A	15 / 30		
Output	Nominal Voltage	VDC	5	12	15
	Minimum Current	A	0		
	Maximum Current	A	1.0	0.45	0.35
	Maximum Power	W	5.0	5.4	5.25
	Voltage Setting Accuracy	%	Fixed ±5% (Max)		
	Maximum Line Regulation (*3)(*4)	mV	20	48	60
	Maximum Load Regulation (*3)(*5)	mV	40	96	120
	Temperature Coefficient (*3)(*6)	mV	50	120	150
	Maximum Ripple & Noise (*3)	mVp-p	120	150	
	Hold-up Time (100VAC)(typ)	ms	17 at 5W, Ta=25℃		
Function	Over Current Protection (*7)		>105%		
	Over Voltage Protection (*8)		>110%		
	Parallel Operation		No		
	Series Operation		Possible		
Environment	Operating Temperature	℃	-10 to 70 (-10 : 80%, 0 to 50 : 100%, 70 : 25%)		
	Storage Temperature	℃	-30 to 85		
	Operating Humidity	%RH	30 - 90 (No dewdrop)		
	Storage Humidity	%RH	20 - 95 (No dewdrop)		
	Vibration		10 - 55Hz, constant amplitude 1.65mmp-p (Max 98.1m/s^2), sweep 1 minute X, Y, Z 1 hour each		
	Shock		Less than 490.3m/s^2 for 11 ± 5ms on ± (X, Y, Z) axis each 3 times		
	Cooling		Convection cooling		
Isolation	Withstand Voltage		Input-Output : 3kVAC (20mA), Input-FG : 2kVAC (20mA) Output-FG : 500VAC (100mA) for 1 minute each		
	Isolation Resistance		More than 100MΩ at 25℃ and 70% RH Output-FG 500VDC		
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950-1 & EN60950		
	EMI (*9)		Built to meet VCCI-Class A & FCC class B & VDE class B		
Mechanical	Weight	g	75		
	Size (W x H x D)	mm	45 x 20.5 x 55		

(*1) At 100VAC and maximum output power, Ta=25℃.

(*2) For cases where conformance to various safety specs (UL, CSA, TUV) are required, to be described as 100 - 240VAC, 50/60Hz on name plate.

(*3) Please refer to Fig. A for measurement determination of line & load regulation and output ripple & noise voltage.

(*4) From 85 - 265VAC, constant load.

(*5) From min load - full load (maximum power), constant input voltage.

(*6) From 0 to 50℃, constant input voltage and load.

(*7) Current limiting with automatic recovery. Avoid to operate over load or dead short for more than 30 seconds.

(*8) Over voltage clamping by zener diode.

(*9) VDE class-B with external capacitor.

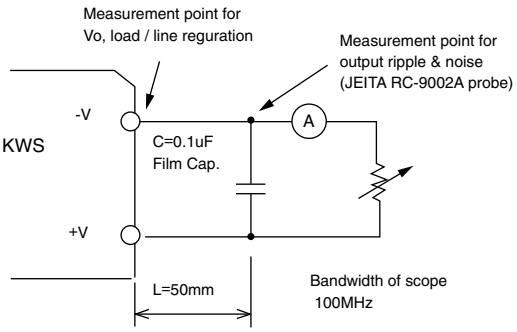
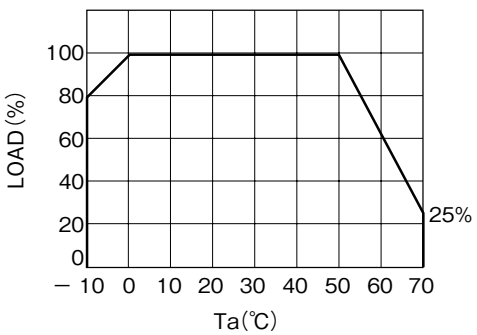


Fig.A

Output Derating



· All specifications are subject to change without notice.

KWS10 Specifications

ITEMS/UNITS		MODEL	KWS10-5	KWS10-12	KWS10-15
Input	Voltage Range (*2)	V	AC85 - 265 or DC110 - 340		
	Frequency (*2)	Hz	47 - 440		
	Efficiency (typ) (*1)	%	73	75	
	Current (100VAC)(typ) (*1)	A	0.3		
	Inrush Current (100/200VAC)(typ)	A	15 / 30		
Output	Nominal Voltage	VDC	5	12	15
	Minimum Current	A	0		
	Maximum Current	A	2.0	0.9	0.7
	Maximum Power	W	10.0	10.8	10.5
	Voltage Setting Accuracy	%	Fixed ±5% (Max)		
	Maximum Line Regulation(*3)(*4)	mV	20	48	60
	Maximum Load Regulation (*3)(*5)	mV	40	96	120
	Temperature Coefficient(*3)(*6)	mV	50	120	150
	Maximum Ripple & Noise (*3)	mVp-p	120	150	
	Hold-up Time (100VAC)(typ)	ms	17 at 10W, Ta=25℃		
Function	Over Current Protection (*7)		>105%		
	Over Voltage Protection (*8)		>110%		
	Parallel Operation		No		
	Series Operation		Possible		
Environment	Operating Temperature	℃	-10 to 70 (-10 : 80%, 0 to 50 : 100%, 70 : 25%)		
	Storage Temperature	℃	-30 to 85		
	Operating Humidity	%RH	30 - 90 (No dewdrop)		
	Storage Humidity	%RH	20 - 95 (No dewdrop)		
	Vibration		10 - 55Hz, constant amplitude 1.65mmp-p (Max 98.1m/s^2), sweep 1 minute X, Y, Z 1 hour each		
	Shock		Less than 490.3m/s^2 for 11±5ms on ± (X, Y, Z) axis each 3 times		
	Cooling		Convection cooling		
Isolation	Withstand Voltage		Input-Output : 3kVAC (20mA), Input-FG : 2kVAC (20mA) Output-FG : 500VAC (100mA) for 1 minute each		
	Isolation Resistance		More than 100MΩ at 25℃ and 70% RH Output-FG 500VDC		
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950-1 & EN60950		
	EMI (*9)		Built to meet VCCI-Class A & FCC class B & VDE class B		
Mechanical	Weight	g	100		
	Size (W x H x D)	mm	45 x 20.5 x 64		

(*1) At 100VAC and maximum output power, Ta=25℃.

(*2) For cases where conformance to various safety specs (UL, CSA, TUV) are required, to be described as 100 - 240VAC, 50/60Hz on name plate.

(*3) Please refer to Fig. A for measurement determination of line & load regulation and output ripple & noise voltage.

(*4) From 85 - 265VAC, constant load.

(*5) From min load - full load (maximum power), constant Input voltage.

(*6) From 0 to +50℃, constant input voltage and load.

(*7) Current limiting with automatic recovery. Avoid to operate over load or dead short for more than 30 seconds.

(*8) Over voltage clamping by zener diode.

(*9) VDE class-B with external capacitor.

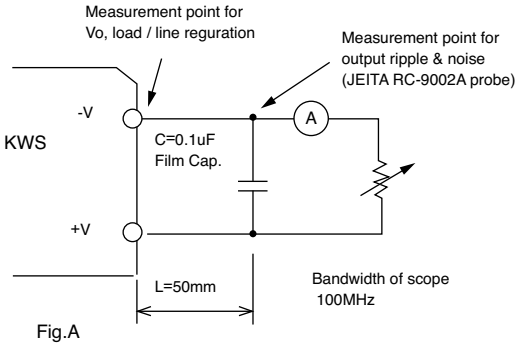
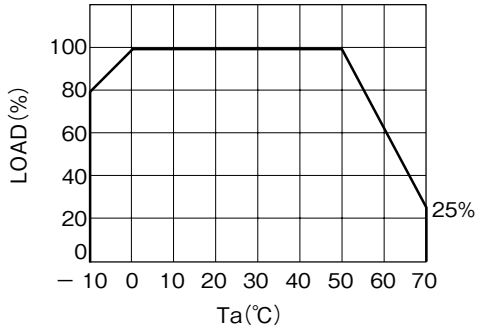


Fig.A

Output Derating



KWS15 Specifications

ITEMS/UNITS \ MODEL			KWS15-5	KWS15-12	KWS15-15
Input	Voltage Range (*2)	V	AC85 - 265 or DC110 - 340		
	Frequency (*2)	Hz	47 - 440		
	Efficiency (typ) (*1)	%	74	77	
	Current (100VAC)(typ) (*1)	A	0.4		
	Inrush Current (100/200VAC)(typ)	A	20 / 40		
Output	Nominal Voltage	VDC	5	12	15
	Minimum Current	A	0		
	Maximum Current	A	3	1.3	1.0
	Maximum Power	W	15.0	15.6	15
	Voltage Setting Accuracy	%	Fixed ±5% (Max)		
	Maximum Line Regulation(*3)(*4)	mV	20	48	60
	Maximum Load Regulation (*3)(*5)	mV	40	96	120
	Temperature Coefficient (*3)(*6)	mV	50	120	150
	Maximum Ripple & Noise (*3)	mVp-p	120	150	
	Hold-up Time (100VAC)(typ)	ms	17 at 15W, Ta=25℃		
Function	Over Current Protection (*7)		>105%		
	Over Voltage Protection (*8)		>110%		
	Parallel Operation		No		
	Series Operation		Possible		
Environment	Operating Temperature	℃	-10 to 70 (-10 : 80%, 0 to 50 : 100%, 70 : 25%)		
	Storage Temperature	℃	-30 to 85		
	Operating Humidity	%RH	30 - 90 (No dewdrop)		
	Storage Humidity	%RH	20 - 95 (No dewdrop)		
	Vibration		10 - 55Hz, constant amplitude 1.65mmp-p (Max 98.1m/s^2), sweep 1 minute X, Y, Z 1 hour each		
	Shock		Less than 490.3m/s^2 for 11±5ms on ± (X, Y, Z) axis each 3 times		
	Cooling		Convection cooling		
Isolation	Withstand Voltage		Input-Output : 3kVAC (20mA), Input-FG : 2kVAC (20mA) Output-FG : 500VAC (100mA) 1 min		
	Isolation Resistance		More than 100MΩ at 25℃ and 70% RH Output-FG 500VDC		
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950		
	EMI (*9)		Built to meet VCCI-Class A & FCC class B & VDE class B		
Mechanical	Weight	g	150		
	Size (W x H x D)	mm	48 x 23.5 x 70		

(*1) At 100VAC and maximum output power, Ta=25℃.

(*2) For cases where conformance to various safety specs (UL, CSA, TUV) are required, to be described as 100 - 240VAC, 50/60Hz on name plate.

(*3) Please refer to Fig. A for measurement determination of line & load regulation and output ripple & noise voltage.

(*4) From 85 - 265VAC, constant load.

(*5) From min load - full load (maximum power), constant input voltage.

(*6) From 0 to 50℃, constant input voltage and load.

(*7) Current limiting with automatic recovery. Avoid to operate over load or dead short for more than 30 seconds.

(*8) Over voltage clamping by zener diode.

(*9) VDE class-B with external capacitor.

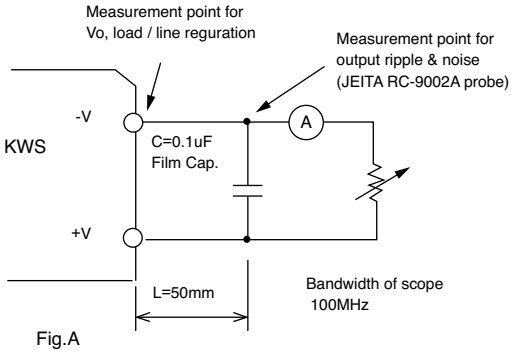
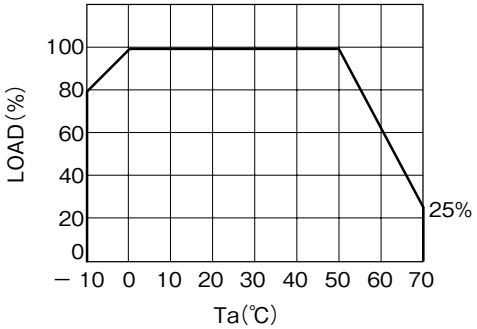


Fig.A

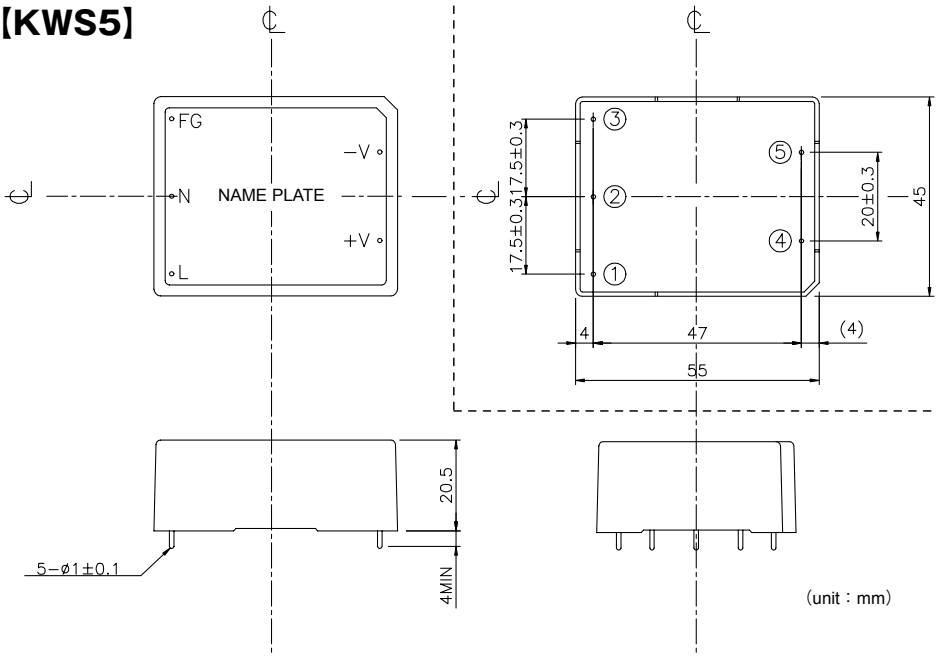
Output Derating



· All specifications are subject to change without notice.

Outline Drawing

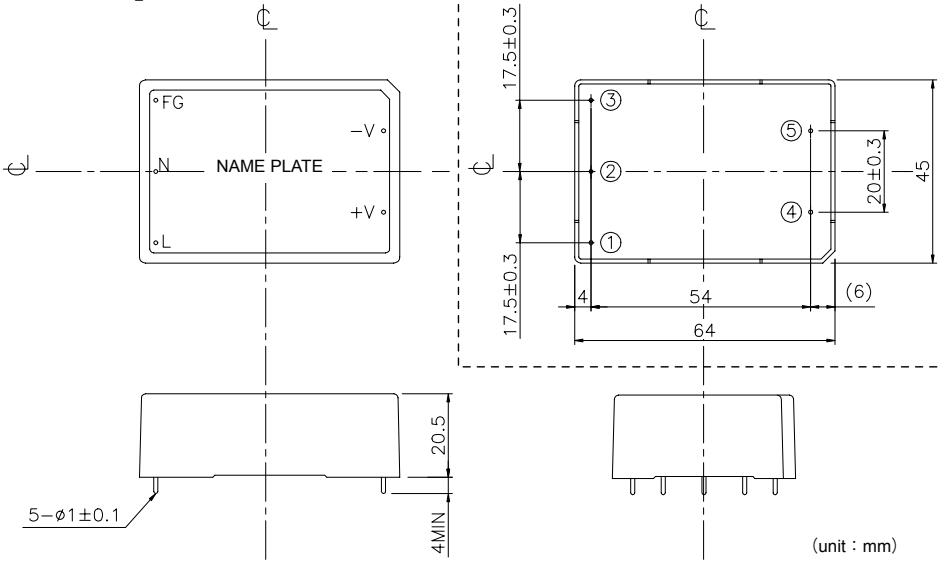
【KWS5】



*TERMINAL ASSIGNMENTS
①…FG
②…AC(N)] INPUT
③…AC(L)]
④…−V] OUTPUT
⑤…+V]

*MATERIAL
CASE：PLASTIC (UL94V-0)

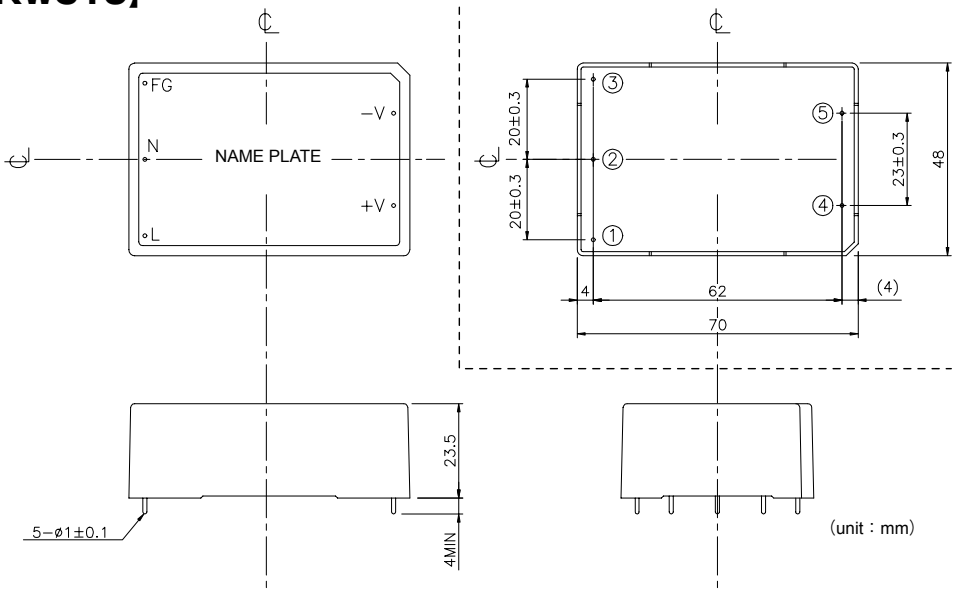
【KWS10】



*TERMINAL ASSIGNMENTS
①…FG
②…AC(N)] INPUT
③…AC(L)]
④…−V] OUTPUT
⑤…+V]

*MATERIAL
CASE：PLASTIC (UL94V-0)

【KWS15】



*TERMINAL ASSIGNMENTS
①…FG
②…AC(N)] INPUT
③…AC(L)]
④…−V] OUTPUT
⑤…+V]

*MATERIAL
CASE：PLASTIC (UL94V-0)

KWD5 Specifications

ITEMS/UNITS			MODEL	KWD5-1212		KWD5-1515	
			CH	1	2	1	2
Input	Voltage Range (*2)	V		AC85 - 265 or DC110 - 340			
	Frequency (*2)	Hz		47 - 440			
	Efficiency (typ) (*1)	%		69		69	
	Current (100VAC)(typ) (*1)	A		0.2			
	Inrush Current (100/200VAC)(typ)	A		15 / 30 at Ta = 25℃			
Output	Nominal Voltage	VDC		+12	-12	+15	-15
	Minimum Current	A		0	0	0	0
	Maximum Current	A		0.22	0.22	0.18	0.18
	Maximum Power	W		5.3		5.4	
	Voltage Setting Accuracy	%		Fixed ±5% (Max)		Fixed ±5% (Max)	
	Maximum Line Regulation (*3)(*4)	mV		60	60	75	75
	Maximum Load Regulation (*3)(*5)	mV		600	600	750	750
	Temperature Coefficient (*3)(*6)	mV		120	120	150	150
	Maximum Ripple & Noise (*3)	mVp-p		150	150	150	150
	Hold-up Time (100VAC)(typ)	ms		17 at 5W, Ta = 25℃			
Function	Over Current Protection (*7)			>105%			
	Over Voltage Protection (*8)			>110%			
	Parallel Operation			----------			
	Series Operation			Possible			
Environment	Operating Temperature (*9)	℃		-10 to 70 (-10 : 80%, 0 to 50 : 100%, 70 : 25%)			
	Storage Temperature	℃		-30 to 85			
	Operating Humidity	%RH		30 - 90 (No dewdrop)			
	Storage Humidity	%RH		20 - 95 (No dewdrop)			
	Vibration			10 - 55Hz, constant amplitude 1.65mmp-p (Max 98.1m/s²), sweep 1 minute X, Y, Z 1 hour each			
	Shock			Less than 490.3m/s² for 11±5mS on ±(X, Y, Z) axis each 3 times			
	Cooling			Convection cooling			
Isolation	Withstand Voltage			Input - Output : 3kVAC (20mA), Input - FG : 2kVAC (20mA), Output - FG : 500VAC (100mA) 1 min			
	Isolation Resistance			More than 100MΩ at 25℃ and 70%RH Output - FG 500VDC			
Standards	Safety Standards			Approved by UL60950 - 1, CSA C22.2 No.60950-1 & EN60950			
	EMI (*9)			Built to meet VCCI - Class B, FCC class B, VDE class B			
Mechanical	Weight	g		75			
	Size (W x H x D)	mm		45 x 20.5 x 55			

(*1) At 100VAC and maximum output power, Ta = 25℃.

(*2) For cases where conformance to various safety specs (UL, CSA, TUV) are required, to be described as 100 - 240VAC, 50/60Hz on name plate.

(*3) Please refer to Fig. A for measurement determination of line & load regulation and output ripple & noise voltage.

(*4) From 85 - 265VAC constant load.

(*5) From min load - full load (maximum power), constant input voltage.

(*6) From 0 to 50℃, constant input voltage and load.

(*7) Current limiting with automatic recovery. Avoid to operate over load or dead short for more than 30 seconds.

(*8) Over voltage clamping by zener diode (on CH2 only).

(*9) VDE class B with external capacitor.

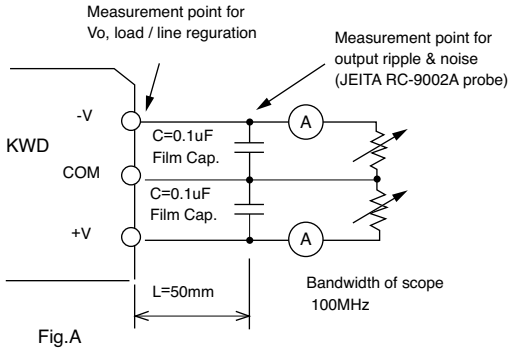
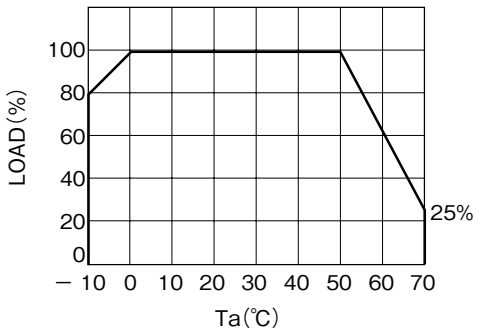


Fig.A

Output Derating



· All specifications are subject to change without notice.

KWD10 Specifications

ITEMS/UNITS		MODEL	KWD10-1212		KWD10-1515	
		CH	1	2	1	2
Input	Voltage Range (*2)	V	AC85 - 265 or DC110 - 340			
	Frequency (*2)	Hz	47 - 440			
	Efficiency (typ) (*1)	%	72			
	Current (100VAC)(typ) (*1)	A	0.3			
	Inrush Current (100/200VAC)(typ)	A	15 / 30 at Ta = 25℃			
Output	Nominal Voltage	VDC	+12	-12	+15	-15
	Minimum Current	A	0	0	0	0
	Maximum Current	A	0.45		0.36	
	Maximum Power	W	10.8		10.8	
	Voltage Setting Accuracy	%	Fixed ±5% (Max)			
	Maximum Line Regulation(*3)(*4)	mV	60	60	75	75
	Maximum Load Regulation (*3)(*5)	mV	600	600	750	750
	Temperature Coefficient(*3)(*6)		120	120	150	150
	Maximum Ripple & Noise (*3)	mVp-p	150	150	150	150
	Hold-up Time (100VAC)(typ)	ms	17 at 5W, Ta = 25℃			
Function	Over Current Protection (*7)		>105%			
	Over Voltage Protection (*8)		>110%			
	Parallel Operation		----------			
	Series Operation		Possible			
Environment	Operating Temperature	℃	-10 to 70 (-10 : 80%, 0 to 50 : 100%, 70 : 25%)			
	Storage Temperature	℃	-30 to 85			
	Operating Humidity	%RH	30 - 90 (No dewdrop)			
	Storage Humidity	%RH	20 - 95 (No dewdrop)			
	Vibration		10 - 55Hz, constant amplitude 1.65mmp-p (Max 98.1m/s²), sweep 1 minute X, Y, Z 1 hour each			
	Shock		Less than 490.3m/s² for 11±5mS on ±(X, Y, Z) axis each 3 times			
	Cooling		Convection cooling			
Isolation	Withstand Voltage		Input - Output : 3kVAC (20mA), Input - FG : 2kVAC (20mA), Output - FG : 500VAC (100mA) for 1 minute each			
	Isolation Resistance		More than 100MΩ at 25℃ and 70%RH Output - FG 500VDC			
Standards	Safety Standards		Approved by UL60950 - 1, CSA C22.2 No.60950-1 & EN60950			
	EMI (*9)		Built to meet VCCI - Class B, FCC class B, VDE class B			
Mechanical	Weight	g	100			
	Size (W x H x D)	mm	45 x 20.5 x 64			

(*1) At 100VAC and maximum output power, Ta = 25℃.

(*2) For cases where conformance to various safety specs (UL, CSA, TUV) are required, to be described as 100 - 240VAC, 50/60Hz on name plate.

(*3) Please refer to Fig. A for measurement determination of line & load regulation and output ripple & noise voltage.

(*4) From 85 - 265VAC, constant load.

(*5) From min load - full load (maximum power), constant input voltage.

(*6) From 0 to +50℃, constant input voltage and load.

(*7) Current limiting with automatic recovery. Avoid to operate over load or dead short for more than 30 seconds.

(*8) Over voltage clamping by zener diode (on CH2 only).

(*9) VDE class B with external capacitor.

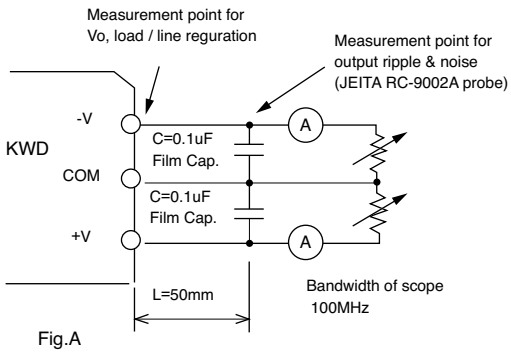
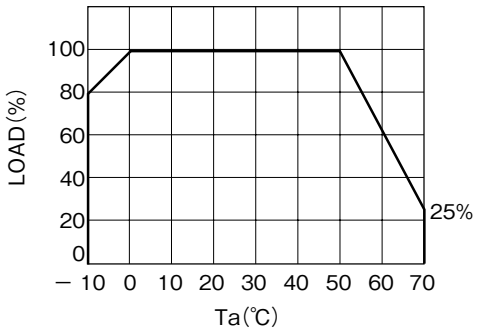


Fig.A

Output Derating



· All specifications are subject to change without notice.

KWD15 Specifications

ITEMS/UNITS			MODEL	KWD15-1212		KWD15-1515	
			CH	1	2	1	2
Input	Voltage Range (*2)	V		AC85 - 265 or DC110 - 340			
	Frequency (*2)	Hz		47 - 440			
	Efficiency (typ) (*1)	%		75		75	
	Current (100VAC)(typ) (*1)	A		0.4			
	Inrush Current (100/200VAC)(typ)	A		20 / 40 at Ta = 25℃			
Output	Nominal Voltage	VDC		+12	-12	+15	-15
	Minimum Current	A		0			
	Maximum Current	A		0.65		0.52	
	Maximum Power	W		15.6		15.6	
	Voltage Setting Accuracy	%		Fixed ±5% (Max)			
	Maximum Line Regulation(*3)(*4)	mV		60	60	75	75
	Maximum Load Regulation (*3)(*5)	mV		600	600	750	750
	Temperature Coefficient(*3)(*6)			120	120	150	150
	Maximum Ripple & Noise (*3)	mVp-p		150	150	150	150
	Hold-up Time (100VAC)(typ)	ms		17 at 5W, Ta = 25℃			
Function	Over Current Protection (*7)			>105%			
	Over Voltage Protection (*8)			>110%			
	Parallel Operation			----------			
	Series Operation			Possible			
Environment	Operating Temperature	℃		-10 to 70 (-10 : 80%, 0 to 50 : 100%, 70 : 25%)			
	Storage Temperature	℃		-30 to 85			
	Operating Humidity	%RH		30 - 90 (No dewdrop)			
	Storage Humidity	%RH		20 - 95 (No dewdrop)			
	Vibration			10 - 55Hz, constant amplitude 1.65mmp-p (Max 98.1m/s²), sweep 1 minute X, Y, Z 1 hour each			
	Shock			Less than 490.3m/s² for 11±5mS on ±(X, Y, Z) axis each 3 times			
	Cooling			Convection cooling			
Isolation	Withstand Voltage			Input - Output : 3kVAC (20mA), Input - FG : 2kVAC (20mA), Output - FG : 500VAC (100mA) for 1 minute each			
	Isolation Resistance			More than 100MΩ at 25℃ and 70%RH Output - FG 500VDC			
Standards	Safety Standards			Approved by UL60950 - 1, CSA C22.2 No.60950-1 & EN60950			
	EMI (*9)			Built to meet VCCI - Class B, ECC Class B, VDE class B			
Mechanical	Weight	g		150			
	Size (W x H x D)	mm		48 x 23.5 x 70 (Refer to outline drawing)			

(*1) At 100VAC and maximum output power, Ta = 25℃.

(*2) For cases where conformance to various safety specs (UL, CSA, TUV) are required, to be described as 100 - 240VAC, 50/60Hz on name plate.

(*3) Please refer to Fig. A for measurement determination of line & load regulation and output ripple & noise voltage.

(*4) From 85 - 265VAC constant load.

(*5) From min load - full load (maximum power), constant input voltage.

(*6) From 0 to 50℃, constant input voltage and load.

(*7) Current limiting with automatic recovery. Avoid to operate over load or dead short for more than 30 seconds.

(*8) Over voltage clamping by zener diode (on CH2 only).

(*9) VDE class B with external capacitor.

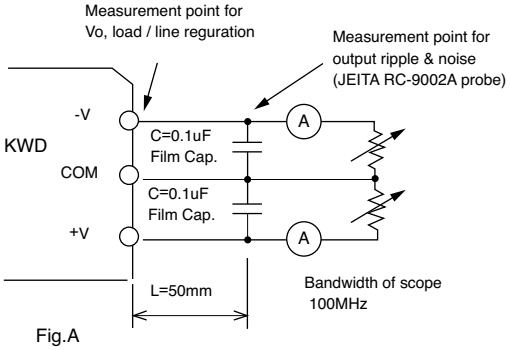
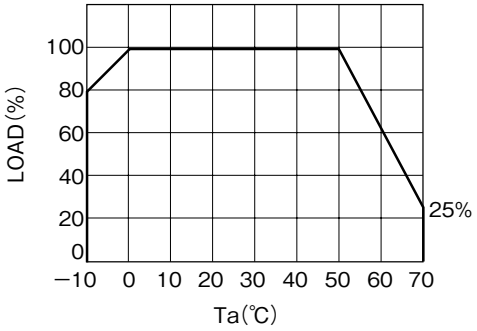


Fig.A

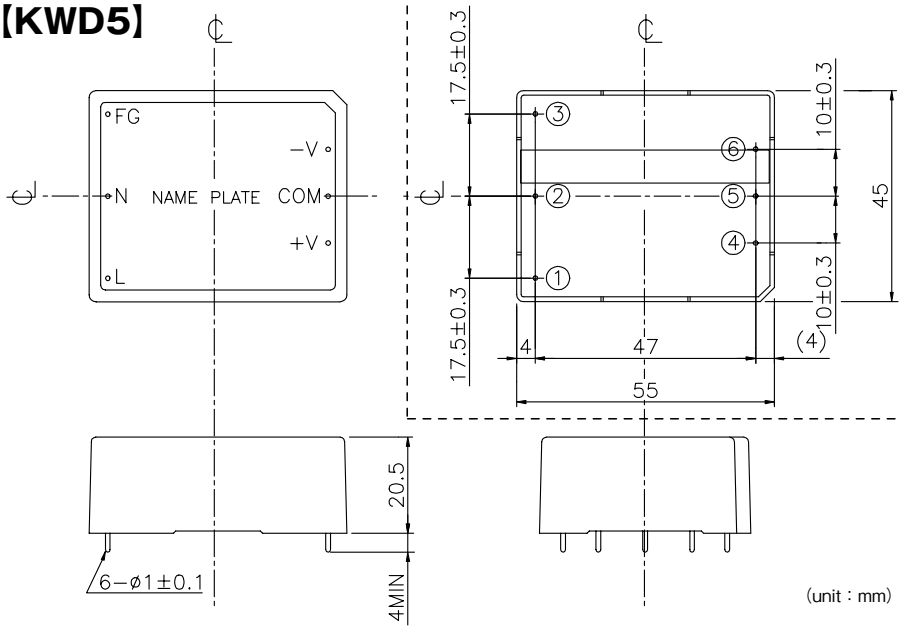
Output Derating



· All specifications are subject to change without notice.

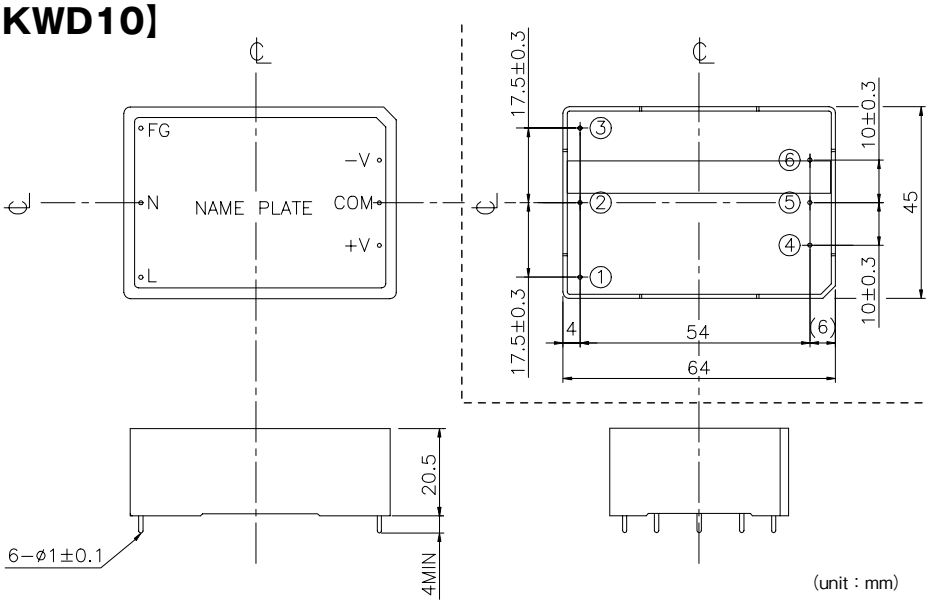
Outline Drawing

【KWD5】



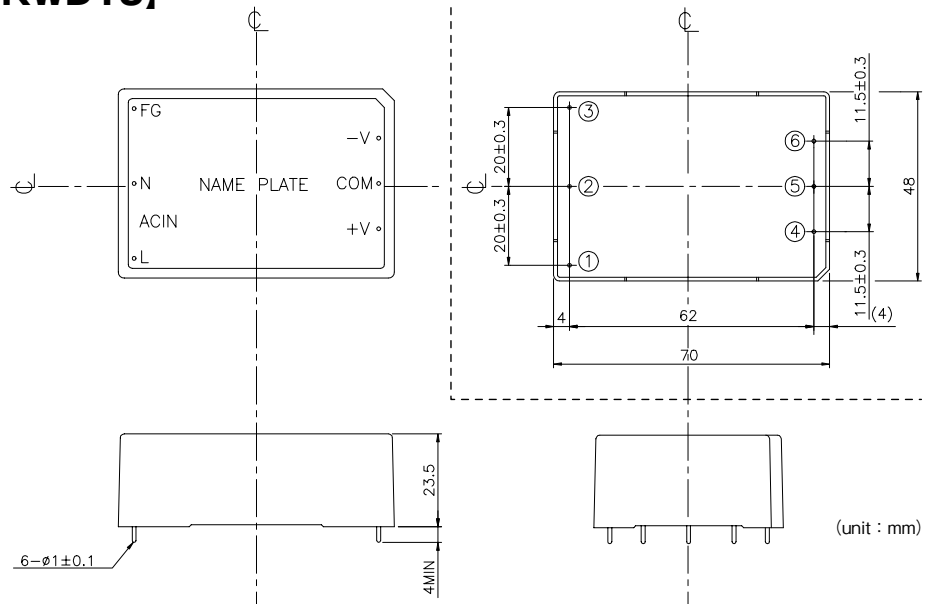
*TERMINAL ASSIGNMRNTS
①…FG
②…AC (N) ┐ INPUT
③…AC (L) ┘
④…−V ┐
⑤…COM ┤ OUTPUT
⑥…+V ┘
*MATERIAL
CASE : PLASTIC (UL94V-0)

【KWD10】



*TERMINAL ASSIGNMRNTS
①…FG
②…AC (N) ┐ INPUT
③…AC (L) ┘
④…−V ┐
⑤…COM ┤ OUTPUT
⑥…+V ┘
*MATERIAL
CASE : PLASTIC (UL94V-0)

【KWD15】

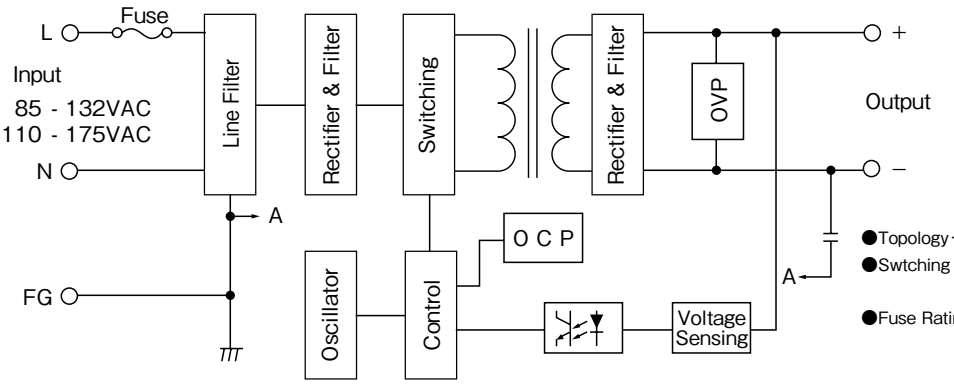


*TERMINAL ASSIGNMRNTS
①…FG
②…AC (N) ┐ INPUT
③…AC (L) ┘
④…−V ┐
⑤…COM ┤ OUTPUT
⑥…+V ┘
*MATERIAL
CASE : PLASTIC (UL94V-0)

KS
KWS
KWD

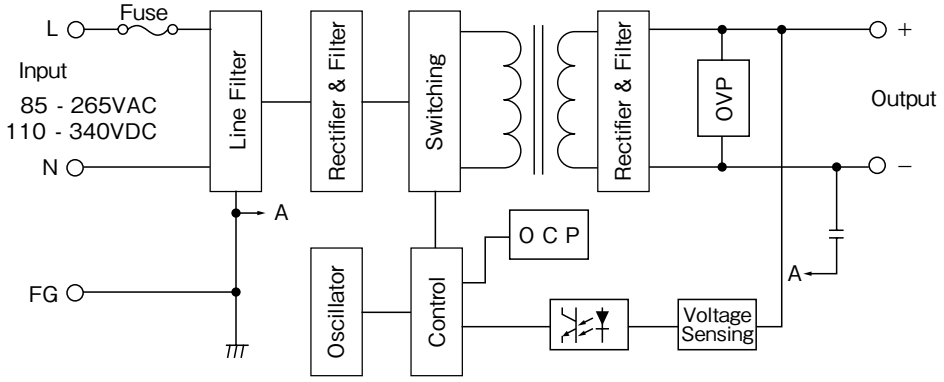
Block Diagram

■ KS SERIES



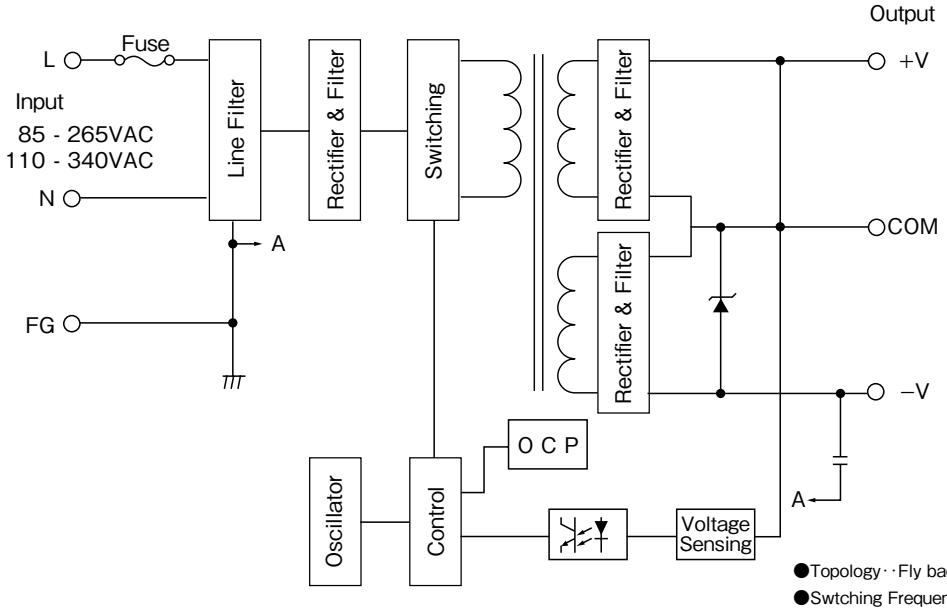
●Topology‥Single-ended forward Type（ON/OFF）
●Swtching Frequency‥KS5：330kHz（Fixed）
KS10、KS15:200kHz（Fixed）
●Fuse Rating‥4A

■ KWS SERIES



●Topology‥Fly back Type（ON/OFF）
●Swtching Frequency‥KWS5、KWS10：220kHz（Fixed）
KWS15：200kHz（Fixed）
●Fuse Rating‥4A

■ KWD SERIES



●Topology‥Fly back Type（ON/OFF）
●Swtching Frequency：KWD5、KWD10…200kHz（Fixed）
KWD15…140kHz（Fixed）
●Fuse Rating…4A

・All specifications are subject to change without notice.

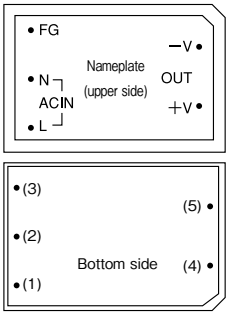
KS/KWS/KWD Series Instruction Manual

BEFORE USING THE POWER SUPPLY UNIT

- Check that input/output terminals are correctly connected according to instruction manual.
- KWS/KWD series are designed for 85-265VAC continuous input. No need to switch operation to 100VAC or 200VAC input voltage.
- KS series is designed for 85-132VAC input. If a 200VAC is input, the power supply unit will be damaged.

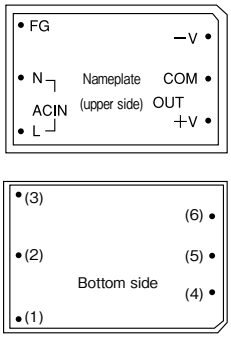
1. Terminal Explanation

1 KS/KWS (single output)



(1) FG: Frame ground terminal for grounding
(2) AC IN (N): AC input terminal (neutral line)
(3) AC IN (L): AC input terminal (live line) fuse in line
(4) DC OUT (-V): DC output terminal ("-" side)
(5) DC OUT (+V): DC output terminal ("+" side)

2 KWD (dual outputs)

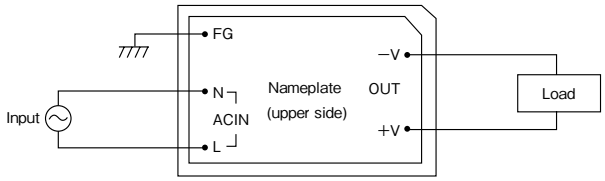


(1) FG: Frame ground terminal for grounding
(2) AC IN (N): AC input terminal (neutral line)
(3) AC IN (L): AC input terminal (live line) fuse in line
(4) -V: CH2 output terminal (-)
(5) COM: Ground terminal of CH1/CH2
(6) +V: CH1 output terminal (+)

2. Terminal Connecting Method

1 KS/KWS (single output)

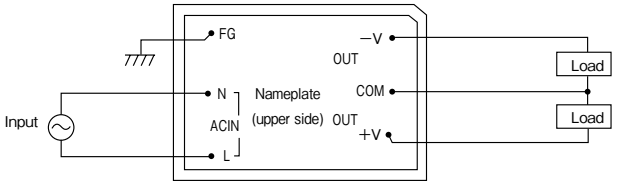
AC input
KS series: 85-132VAC
KWS series: 85-265VAC
(Continuous input type)



- A fuse in line of the power supply unit (L side of AC IN).
- KS series is designed for 85-132VAC input.
  If a 200VAC is input, the unit may be damaged.
- KWS series is designed for 85-256VAC continuous input.
  No need to switch.

2 KWD terminal (dual outputs)

AC input
85-265VAC
(Continuous input type)



- A fuse in line of the power supply unit (L side of AC IN).
- KWD series is designed for 85-256VAC continuous input and the input switching operation is not necessary.

3. Explanation of Functions and Precautions

1 Over Current Protection (OCP)

OCP type is current limiting with automatic recovery. OCP function operates when the output current exceeds 105% or above of OCP specifications. The output automatically recovers when the over current / shorted conditions is removed. Do not operate under overload or dead short conditions for more than 30 seconds, which could result in damage to the unit.

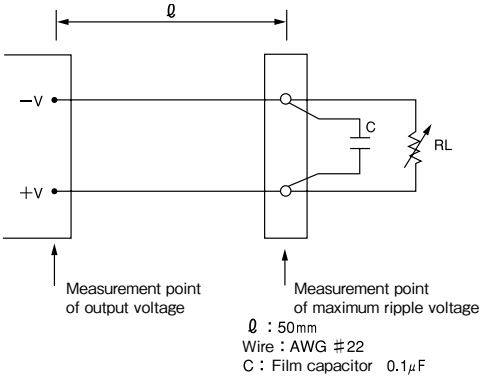
2 Over Voltage Protection (OVP)

The over voltage protection (OVP) circuit with zener diode clamp system is built in. (In KWD series, OVP circuit is built into CH2 only.) Over 110% of nominal voltage will clamp the output. If the output voltage is lowered due to the over voltage application, the output will not resume. Replacement of the power supply unit is necessary.

3 Ripple

The maximum ripple voltage value in the specifications is measured in the ripple measurement circuit designated by JEITA RC-9131 probe. When the load wire is long, connect a film capacitor, etc., to prevent the ripple at the load terminal from becoming large. Note that the accurate measurement is not possible if the probe ground lead of the oscilloscope is long in measurement.

"Ripple measurement circuit"



ℓ : 50mm
Wire : AWG #22
C : Film capacitor 0.1μF

4 EMI

KWS and KWD series are built to meet the VDE Class B standards by adding external capacitor between L and N on the input side.

Refer to the recommended values below.

KWS5, KWD5: AC250V 0.22μF
KWS10, KWD10: AC250V 0.22μF
KWS15, KWD15: AC250V 0.33μF

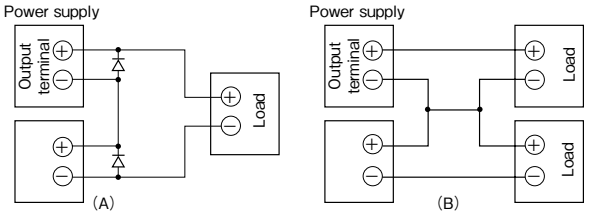
5 Inrush Current

KS10 and KS15 use power thermistor to protect the circuit from inrush current. In power thermistor, the suppressed current value changes depending on the temperature, and the inrush current may become large in conditions with high temperature or when restarting input soon after stopping it.

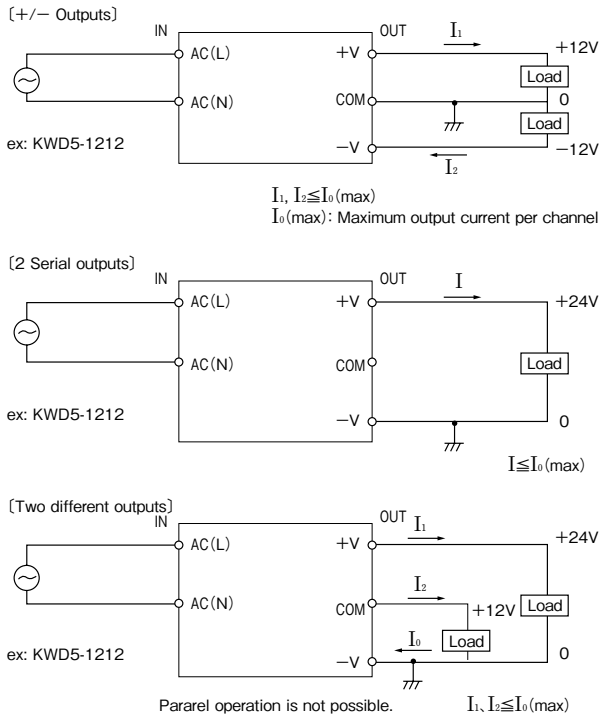
6 Series/Parallel Operations

For series operation, either (A) or (B) is possible. Please connect a diode for by-pass when using method (A) of the series operation. Please use the diode whose rated forward current is equal or more than load current and the rated maximum reverse voltage is higher than the output voltage for each power supply.

● **KS, KWS series**

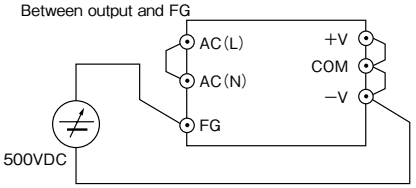


● **KWD series**



7 Isolation Test

The insulation resistance between output and FG is more than 100MΩ at 500VDC. For safety operation, voltage setting of DC isolation tester must be done before the test. Ensure that it is fully discharged after the test.



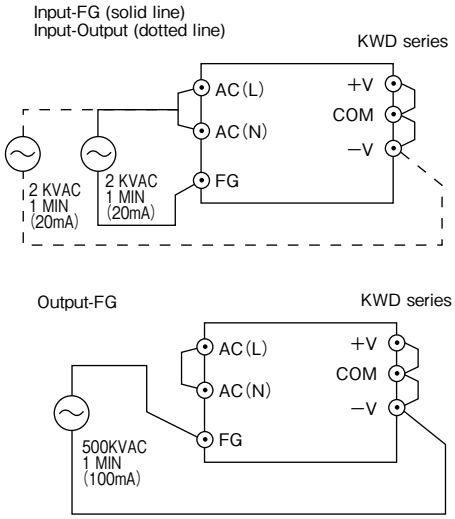
8 Withstand Voltage

This series is designed to withstand 2kVAC for between input and output, 2kVAC between input and FG, and 500VAC between output and FG each for 1 minute. When testing withstand voltage, set current limit or withstand voltage test equipment at 20mA. (Output-FG: 100mA)

· All specifications are subject to change without notice.

The applied voltage must be gradually increased from zero to testing value and then gradually decrease for shut down. When timer is used, the power supply may be damaged by high impulse voltage at timer switch on and off. If a timer is used for measuring the test time, impulsive high voltage may be generated in applying and cutting off the voltage, causing damage to the unit.

* 3kVAC between input and output for KWS/KWD series



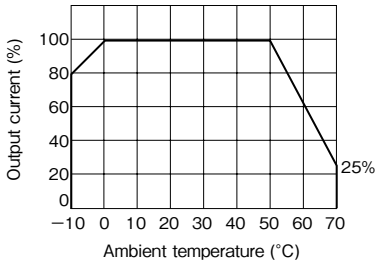
* For KS/KWS series, connect the +V and -V terminals of the output. (KS/KWS series are not equipped with the COM terminal.)

KS
KWS
KWD

4. Output Derating

There is no restriction on mountintg direction but there should be enough consideration for airflow so that heat does not accumulate around the power module vicinity.

Also note that the output derating is necessary when the ambient temperature is high, as shown in the figure in the right.



5. Recommended soldering/cleaning

1 Recommended soldering medhod

The temperature conditions in soldering should be the following.

- Dip condition: 260℃, within 10 seconds
  Pre-heat conditions: 110℃ for 30-40 seconds
- Soldering iron: 350℃ within 3 seconds

2 Recommended cleaning conditions

Recommended cleaning conditions after soldering are shown below.

- Cleaning solvent
  IPA (isopropyl alcohol)
- Cleaning procedure
  Cleaning should be conducted with a method that does not cause intrusion of the cleaning fluid into the inside of the power supply unit. (Note that if the cleaning fluid intrudes into inside of the power supply unit, the reliability of the power supply may be impaired.)
  Note) Consult us if your cleaning method is other than that recommended above.

6. Before concluding power module damage

Check if the rated input voltage is connected.

Check if the wiring of input and output are correct.

Check if the pattern width connected to input/output is not too narrow.

Ensure that a large capacitor is not connected on the output side.

Please use within maximum capacitance shown below.

KS5: 5V 100 μF or lower, 12V 200 μF or lower
KS10: 5V 200 μF or lower, 12V 400 μF or lower
KS15: 5V 400 μF or lower, 12V 1,000 μF or lower
KWS5: 5V 2,000 μF or lower, 12V/15V 200 μF or lower
KWS10: 5V 2,000 μF or lower, 12V/15V 1,000 μF or lower
KWS15: 5V 2,000 μF or lower, 12V/15V 1,000 μF or lower
KWD5: 800 μF or lower
KWD10: 1212 1,000 μF or lower, 1515 500 μF or lower
KWD15: 1212 1,000 μF or lower, 1515 1,000 μF or lower

TDK·Lambda