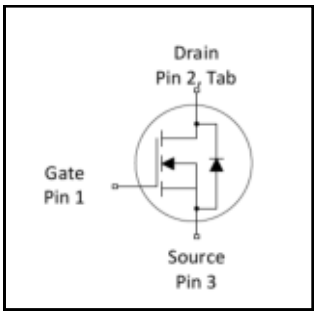
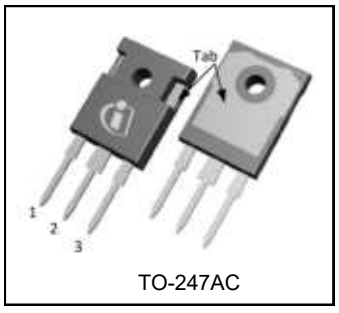
PDP SWITCH

Key Parameters		
V_{DS} max	200	V
$V_{DS\ (Avalanche)}$ typ.	240	V
$R_{DS(ON)}$ typ. @ 10V	21	mΩ
I_{RP} max @ T_C= 100°C	130	A
T_J max	175	°C





TO-247AC

Features

- Advanced Process Technology
- Key Parameters Optimized for PDP Sustain, Energy Recovery and Pass Switch Applications
- Low E_{PULSE} Rating to Reduce Power Dissipation in PDP Sustain, Energy Recovery and Pass Switch Applications
- Low Q_G for Fast Response
- High Repetitive Peak Current Capability for Reliable Operation
- Short Fall & Rise Times for Fast Switching
- 175°C Operating Junction Temperature for Improved Ruggedness
- Repetitive Avalanche Capability for Robustness and Reliability

Description

This HEXFET® Power MOSFET is specifically designed for Sustain; Energy Recovery & Pass switch applications in Plasma Display Panels. This MOSFET utilizes the latest processing techniques to achieve low on-resistance per silicon area and low E_{PULSE} rating. Additional features of this MOSFET are 175°C operating junction temperature and high repetitive peak current capability. These features combine to make this MOSFET a highly efficient, robust and reliable device for PDP driving applications

Absolute Maximum Ratings			
Symbol	**Parameter**	**Max.**	**Units**
V_{GS}	Gate-to-Source Voltage	± 30	V
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	65	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V	46	
I_{DM}	Pulsed Drain Current ①	260	
I_{RP} @ T_C = 100°C	Repetitive Peak Current ⑤	130	
P_D @T_C = 25°C	Maximum Power Dissipation	330	W
P_D @T_C = 100°C	Maximum Power Dissipation	190	
	Linear Derating Factor	2.2	W/°C
T_J T_{STG}	Operating Junction and Storage Temperature Range	-40 to + 175	°C
	Soldering Temperature, for 10 seconds (1.6mm from case)	300	
	Mounting torque, 6-32 or M3 screw	10 lbf•in (1.1N•m)	

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ④	—	0.45	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient ④	—	62	

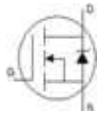
Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	200	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	170	—	mV/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	21	25	mΩ	V_{GS} = 10V, I_D = 46A ③
$V_{GS(th)}$	Gate Threshold Voltage	3.0	—	5.0	V	V_{DS} = V_{GS}, I_D = 250µA
$\Delta V_{GS(th)}/\Delta T_J$	Gate Threshold Voltage Temp. Coefficient	—	-13	—	mV/°C	
I_{DSS}	Drain-to-Source Leakage Current	—	—	20	µA	V_{DS} = 200V, V_{GS} = 0V
		—	—	1.0	mA	V_{DS} = 200V,V_{GS} = 0V,T_J =125°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-100		V_{GS} = -20V
gfs	Forward Trans conductance	49	—	—	S	V_{DS} = 25V, I_D = 46A
Q_g	Total Gate Charge	—	70	98	nC	I_D = 46A,V_{DS} = 100V 10V ③
Q_{gd}	Gate-to-Drain Charge	—	23	—		V_{GS} = 10V
$t_{d(on)}$	Turn-On Delay Time	—	33	—	ns	V_{DD} = 100V, V_{GS} = 10V ③
t_r	Rise Time	—	20	—		I_D = 46A
$t_{d(off)}$	Turn-Off Delay Time	—	21	—		R_G= 2.5Ω
t_f	Fall Time	—	31	—		See Fig. 22
t_{st}	Shoot Through Blocking Time	100	—	—	ns	V_{DD} = 160V,V_{GS} = 15V,R_G= 4.7Ω
E_{PULSE}	Energy per Pulse	—	570	—	µJ	L = 220nH, C = 0.4µF, V_{GS} = 15V V_{DD} = 160V, R_G= 4.7Ω, T_J = 25°C
		—	910	—		L = 220nH, C = 0.4µF, V_{GS} = 15V V_{DD} = 160V, R_G= 4.7Ω, T_J = 100°C
C_{iss}	Input Capacitance	—	4600	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	460	—		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	—	91	—		f = 1.0MHz
C_{oss} eff.	Effective Output Capacitance	—	360	—		V_{GS} = 0V, V_{DS} = 0V to 160V
L_D	Internal Drain Inductance	—	5.0	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact 
L_S	Internal Source Inductance	—	13	—		

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②	—	140	mJ
E_{AR}	Repetitive Avalanche Energy ①	—	33	
$V_{DS(Avalanche)}$	Repetitive Avalanche Voltage ①	240	—	V
I_{AS}	Avalanche Current ②	—	39	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S @ T_C = 25°C	Continuous Source Current (Body Diode)	—	—	65	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	260		
V_{SD}	Diode Forward Voltage	—	—	1.3	V	T_J = 25°C,I_S = 46A,V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	—	100	150	ns	T_J = 25°C ,I_F = 46A, V_{DD} = 50V
Q_{rr}	Reverse Recovery Charge	—	430	640	nC	di/dt = 100A/µs ③

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② starting T_J = 25°C, L = 0.18mH, R_G = 25Ω, I_{AS} = 38A.

③ Pulse width ≤ 400µs; duty cycle ≤ 2%.

④ R_θ is measured at T_J of approximately 90°C.

⑤ Half sine wave with duty cycle = 0.25, ton=1µsec.

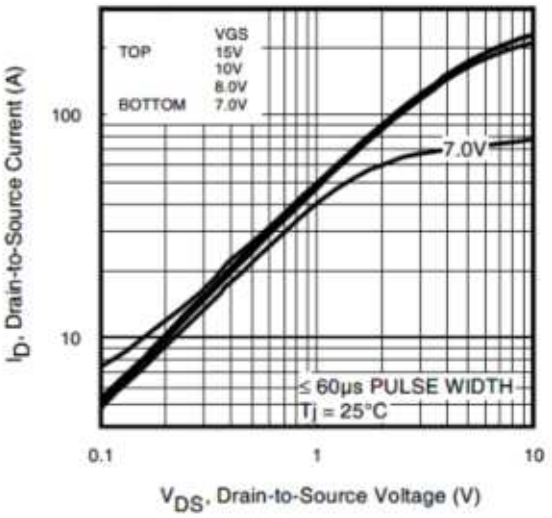


Fig. 1. Typical Output Characteristics

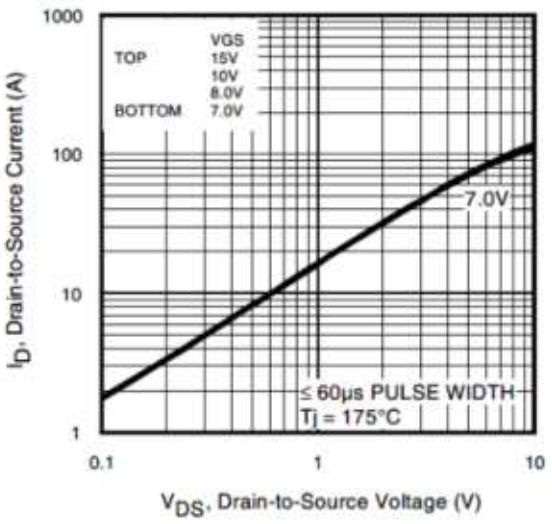


Fig. 2. Typical Output Characteristics

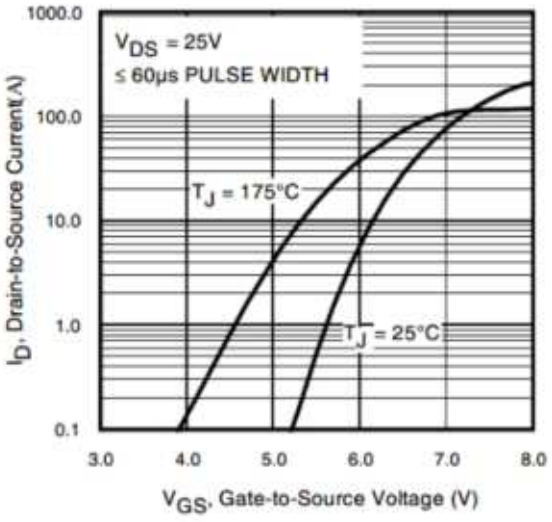


Fig. 3. Typical Transfer Characteristics

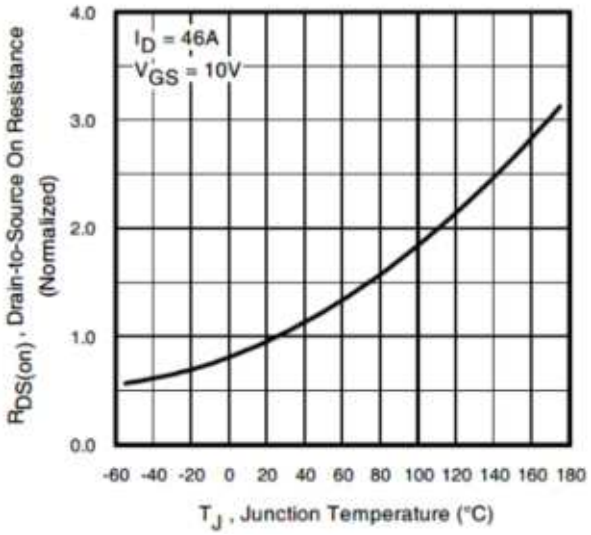


Fig. 4. Normalized On-Resistance vs. Temperature

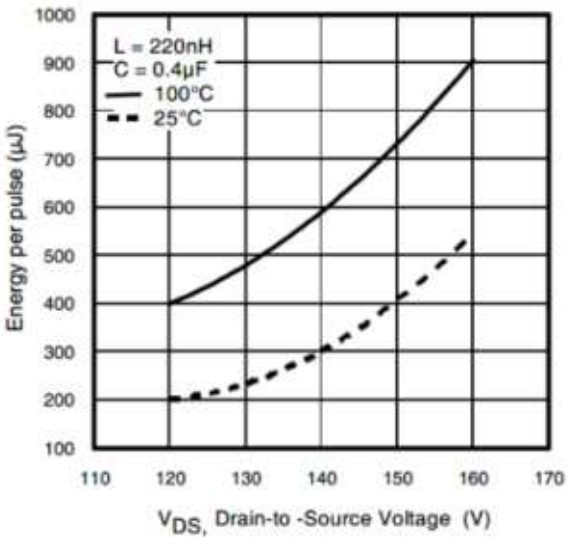


Fig 5. Typical E_{PULSE} vs. Drain-to-Source Voltage

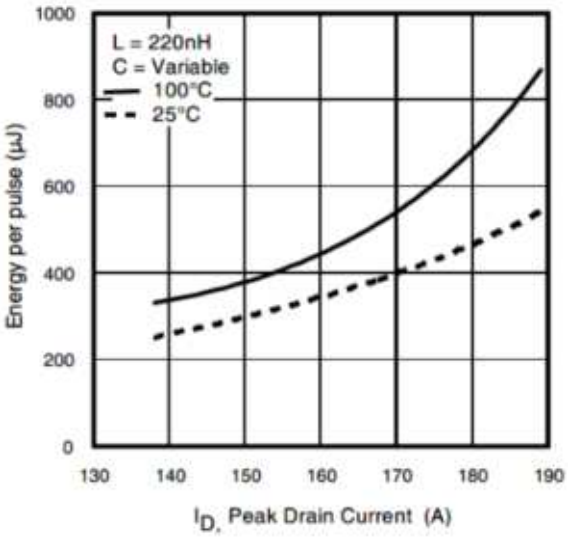


Fig 6. Typical E_{PULSE} vs. Drain Current

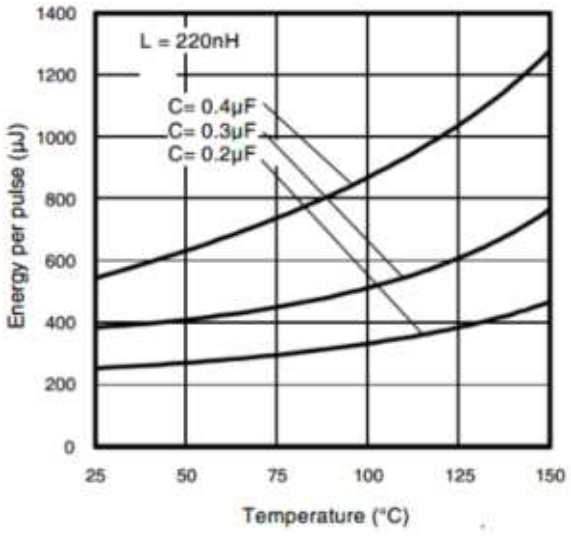


Fig. 7. Typical E_{PULSE} vs. Temperature

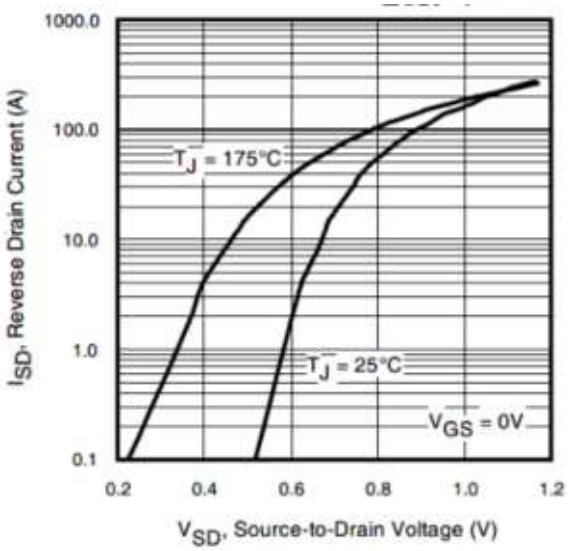


Fig 8. Typical Source-Drain Diode Forward Voltage

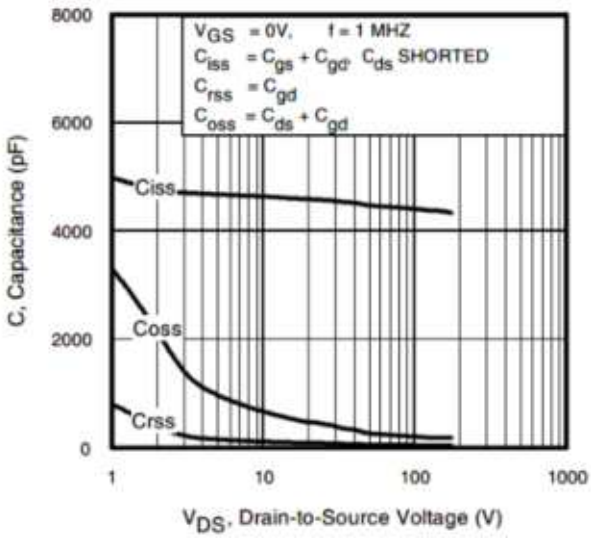


Fig 9. Typical Capacitance vs.Drain-to-Source Voltage

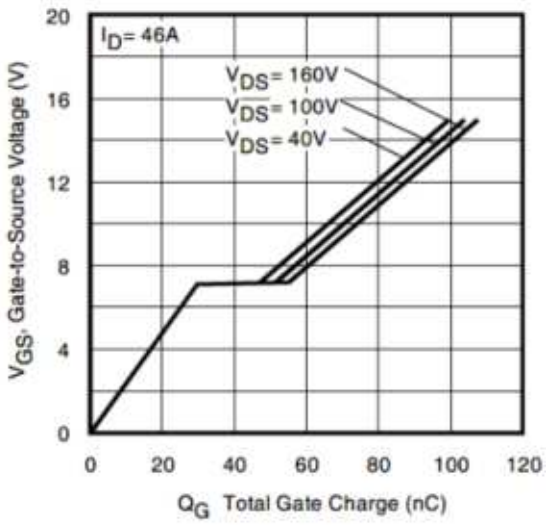


Fig 10. Typical Gate Charge vs. Gate-to-Source Voltage

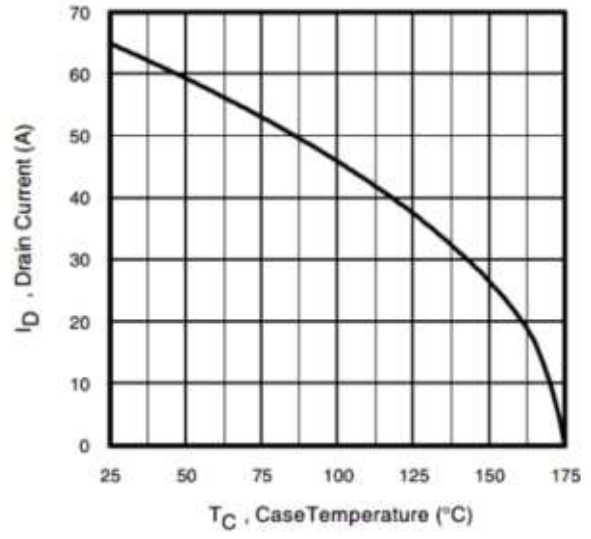


Fig 11. Maximum Drain Current vs. Case Temperature

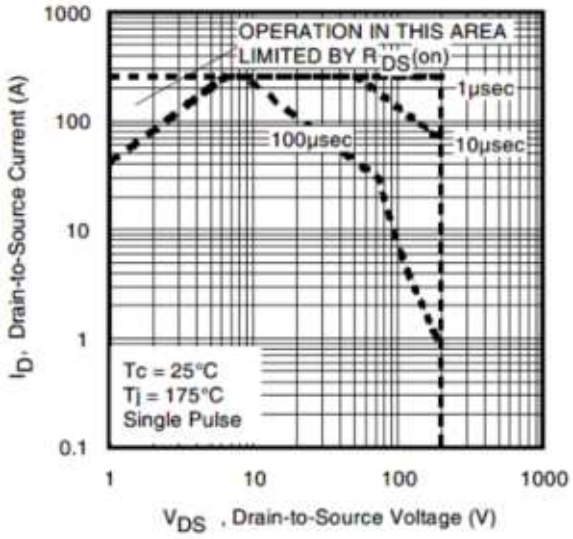


Fig 12. Maximum Safe Operating Area

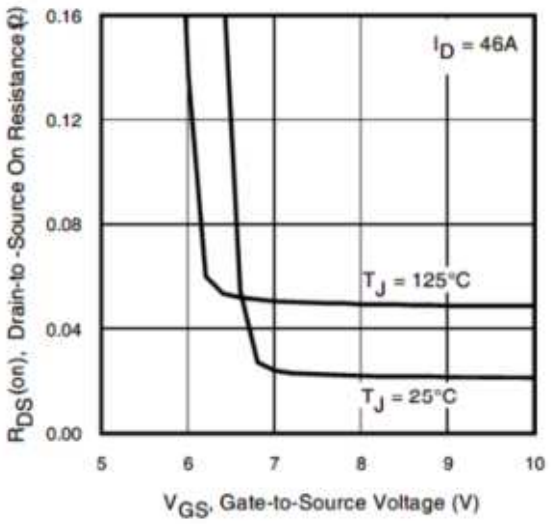


Fig. 13. On-Resistance Vs. Gate Voltage

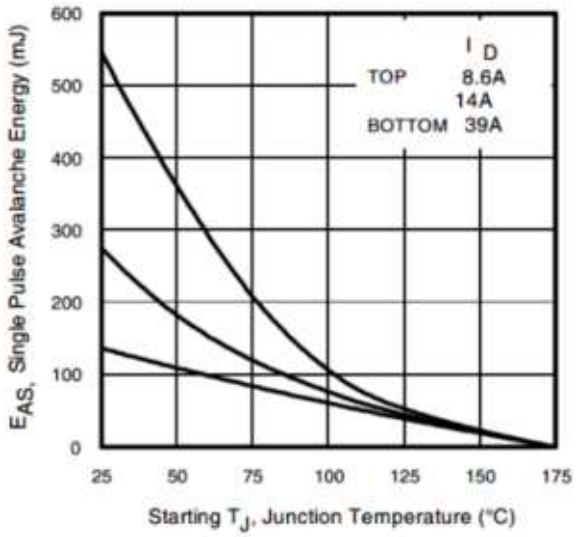


Fig. 14. Maximum Avalanche Energy Vs. Temperature

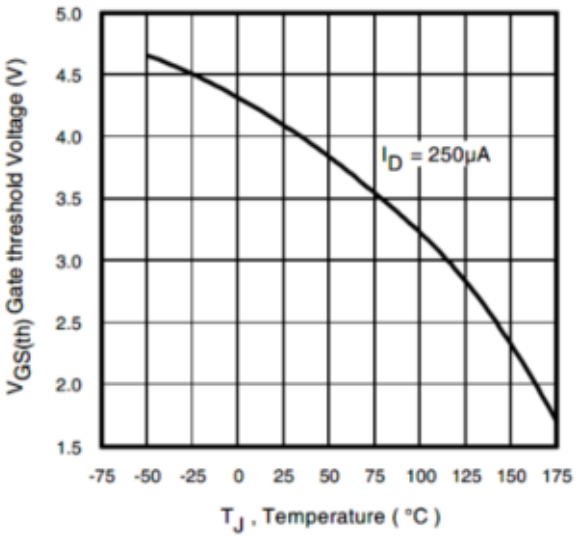


Fig. 15. Threshold Voltage vs. Temperature

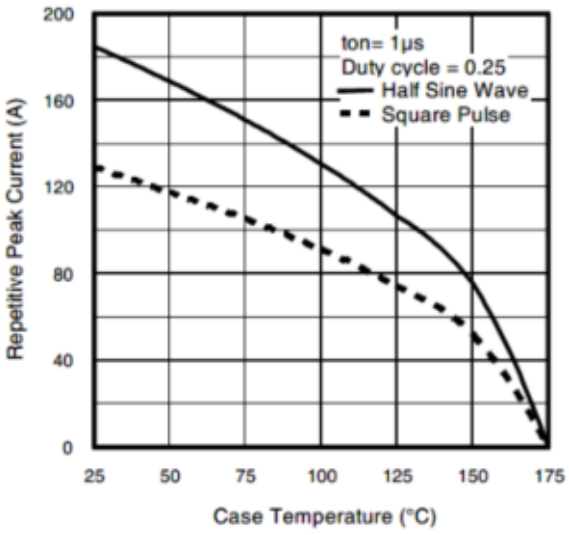


Fig. 16. Typical Repetitive peak Current vs. Case temperature

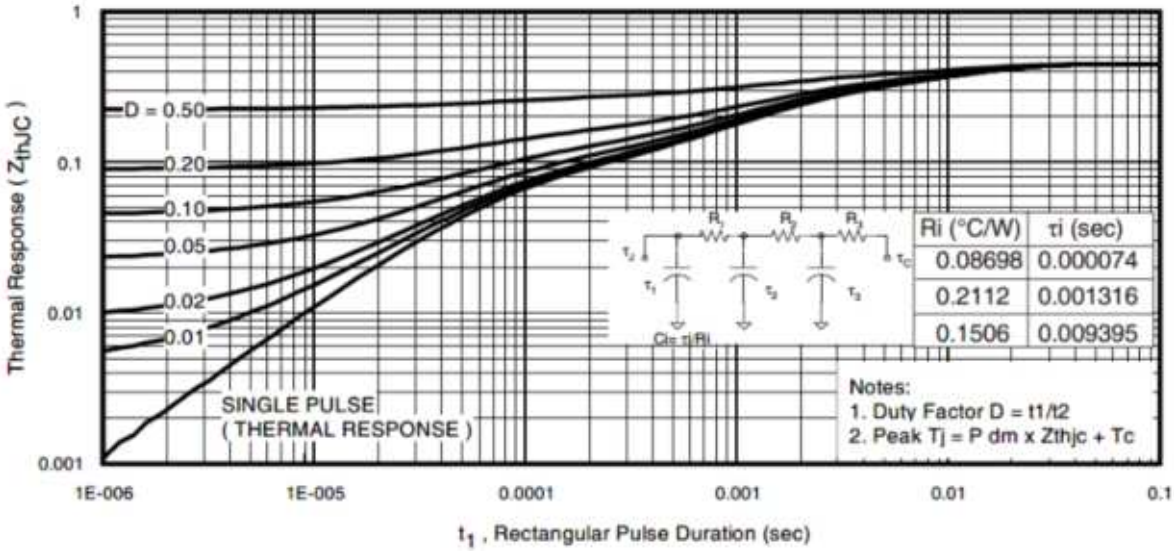


Fig 17. Maximum Effective Transient Thermal Impedance, Junction-to-Case

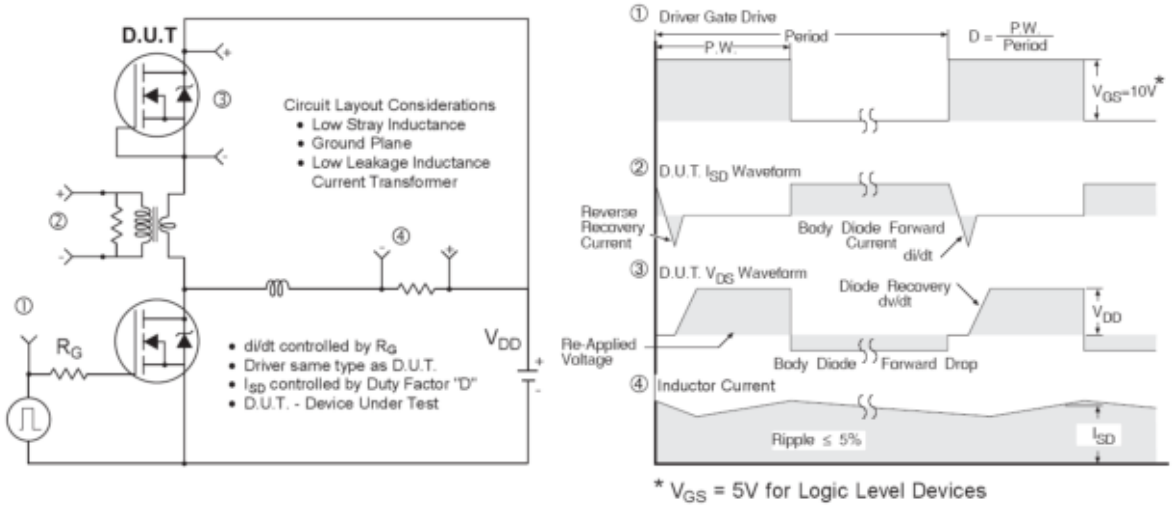


Fig 18. Diode Reverse Recovery Test Circuit for N-Channel HEXFET® Power MOSFETs

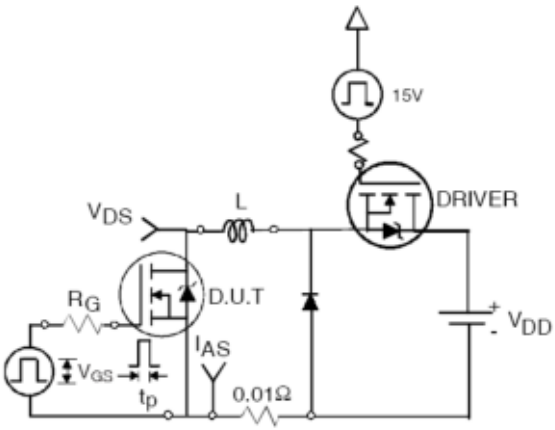


Fig 19a. Unclamped Inductive Test Circuit

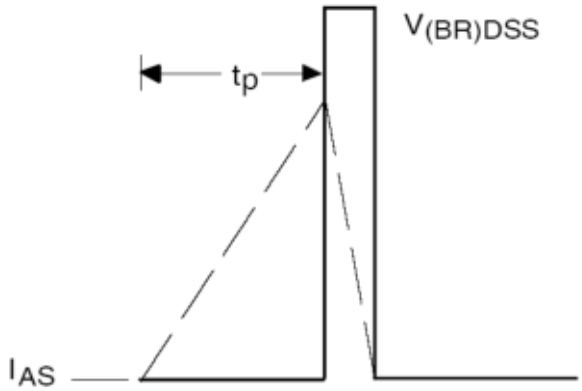


Fig 19b. Unclamped Inductive Waveforms

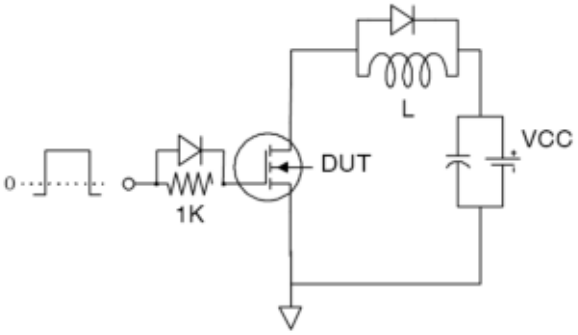


Fig 20a. Gate Charge Test Circuit

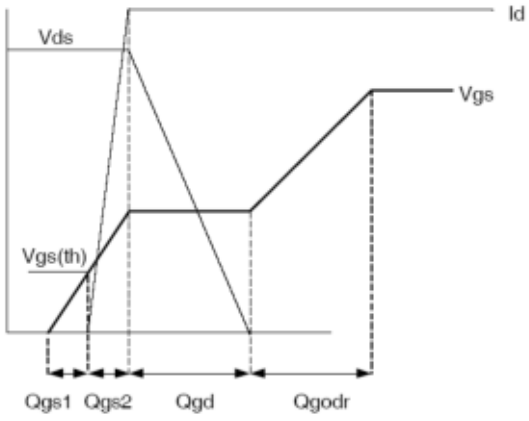


Fig 20b. Gate Charge Waveform

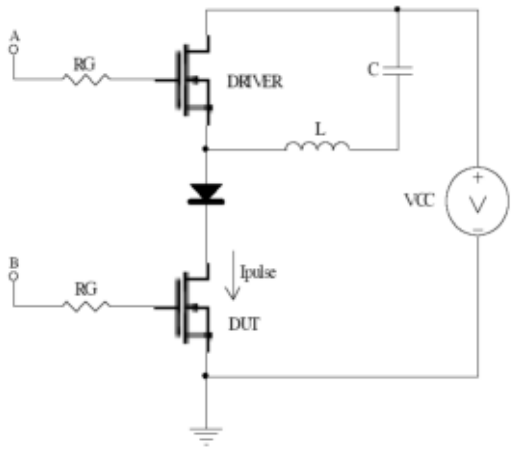


Fig 21a. t_{st} and E_{PULSE} Test Circuit

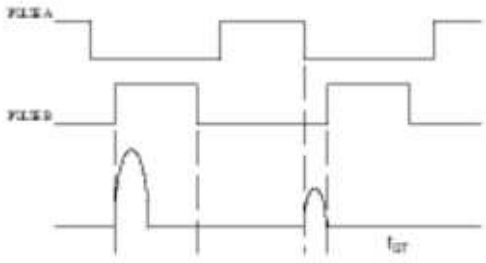


Fig 21b. t_{st} Test Waveforms

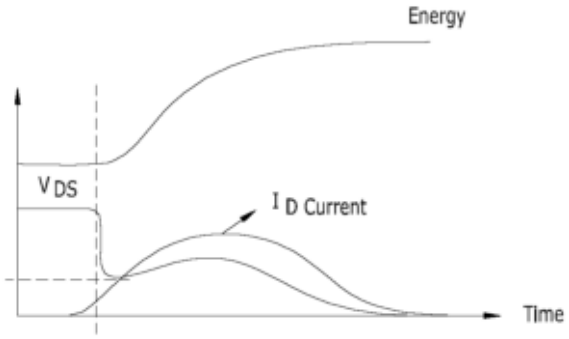


Fig 21c. E_{PULSE} Test Waveforms

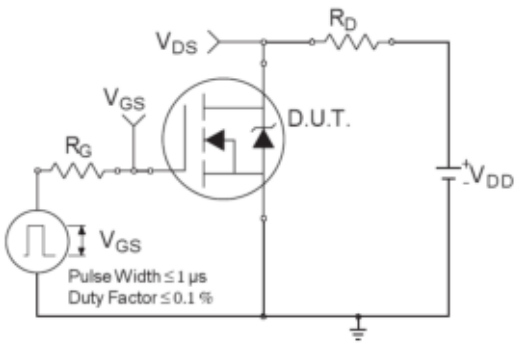


Fig 22a. Switching Time Test Circuit

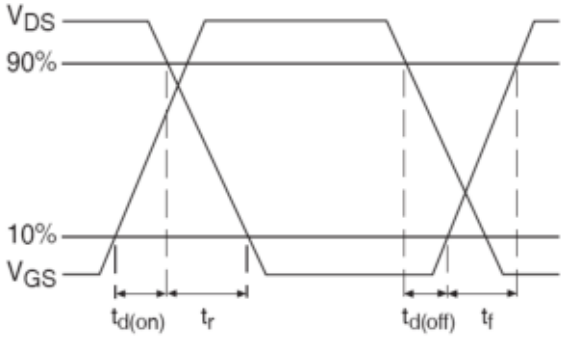
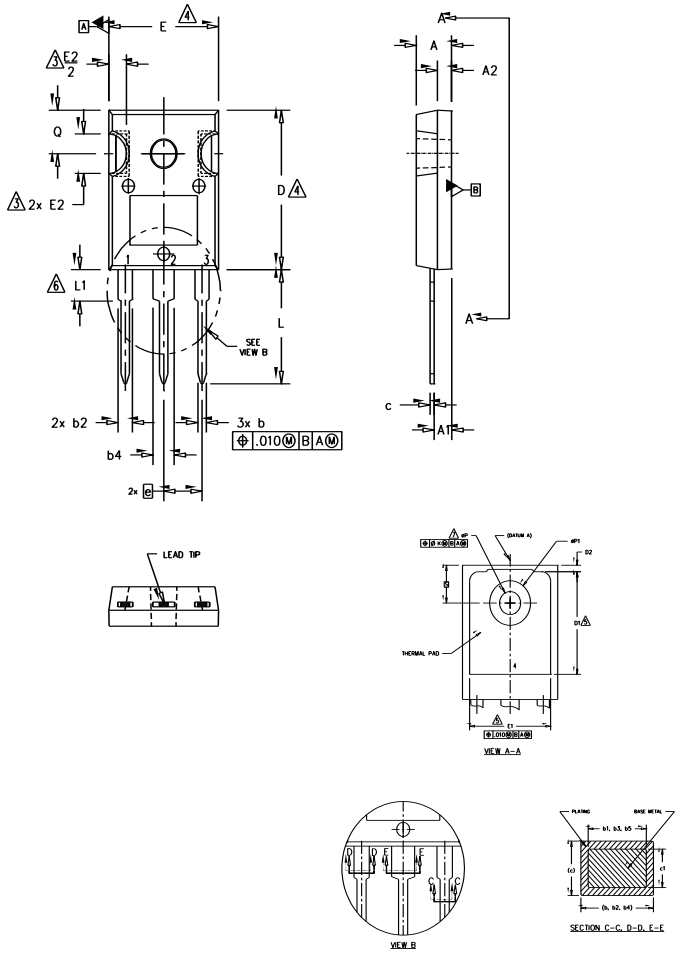


Fig 22b. Switching Time Waveforms

TO-247AC Package Outline (Dimensions are shown in millimeters (inches))



NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M 1994.
2. DIMENSIONS ARE SHOWN IN INCHES.
3. CONTOUR OF SLOT OPTIONAL.
4. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
5. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS D1 & E1.
6. LEAD FINISH UNCONTROLLED IN L1.
7. øP TO HAVE A MAXIMUM DRAFT ANGLE OF 1.5 ° TO THE TOP OF THE PART WITH A MAXIMUM HOLE DIAMETER OF .154 INCH.
8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-247AC .

SYMBOL	DIMENSIONS				NOTES
	INCHES		MILLIMETERS		
	MIN.	MAX.	MIN.	MAX.	
A	.183	.209	4.65	5.31	
A1	.087	.102	2.21	2.59	
A2	.059	.098	1.50	2.49	
b	.039	.055	0.99	1.40	
b1	.039	.053	0.99	1.35	
b2	.065	.094	1.65	2.39	
b3	.065	.092	1.65	2.34	
b4	.102	.135	2.59	3.43	
b5	.102	.133	2.59	3.38	
c	.015	.035	0.38	0.89	
c1	.015	.033	0.38	0.84	
D	.776	.815	19.71	20.70	4
D1	.515	–	13.08	–	5
D2	.020	.053	0.51	1.35	
E	.602	.625	15.29	15.87	4
E1	.530	–	13.46	–	
E2	.178	.216	4.52	5.49	
e	.215 BSC		5.46 BSC		
øk	.010		0.25		
L	.559	.634	14.20	16.10	
L1	.146	.169	3.71	4.29	
øP	.140	.144	3.56	3.66	
øP1	–	.291	–	7.39	
Q	.209	.224	5.31	5.69	
S	.217 BSC		5.51 BSC		

LEAD ASSIGNMENTS

HEXFET

1.– GATE
2.– DRAIN
3.– SOURCE
4.– DRAIN

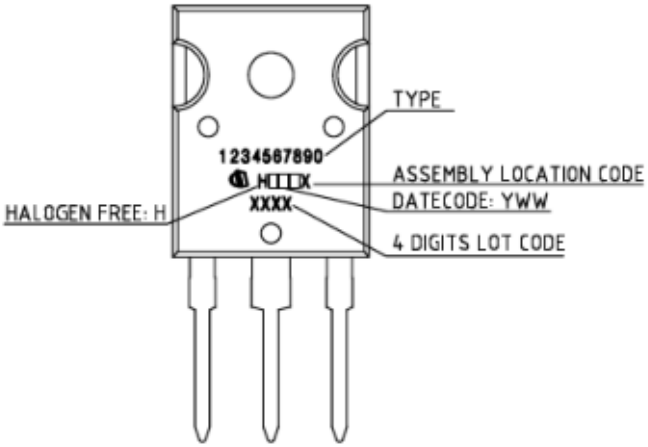
IGBTs, CoPACK

1.– GATE
2.– COLLECTOR
3.– EMITTER
4.– COLLECTOR

DIODES

1.– ANODE/OPEN
2.– CATHODE
3.– ANODE

TO-247AC Part Marking Information



TO-247AC package is not recommended for Surface Mount Application.

Revision History

Date	Rev.	Comments
2013-09-06	2.0	• Final data sheet
2024-12-05	2.1	• Update datasheet to Infineon format • Updated Part marking –page 8 • Added disclaimer on last page.

Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

We Listen to Your Comments

Any information within this document that you feel is wrong, unclear or missing at all? Your feedback will help us to continuously improve the quality of this document. Please send your proposal (including a reference to this document) to:
erratum@infineon.com

Published by

Infineon Technologies AG

81726 München, Germany

© 2024 Infineon Technologies AG

All Rights Reserved.

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics

(“Beschaffenheitsgarantie”).

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer’s compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer’s products and any use of the product of Infineon Technologies in customer’s applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer’s technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

Information

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (www.infineon.com).

Warnings

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

The Infineon Technologies component described in this Data Sheet may be used in life support devices or systems and or automotive, aviation and aerospace applications or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life support, automotive, aviation and aerospace device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

Revision history

IRFP4227PbF

Revision 2025-01-13, Rev. 1.0

Previous revisions

Revision	Date	Subjects (major changes since last revision)
1.0	2025-01-13	Update datasheet to Infineon format, Updated Part marking –page 8

Trademarks
All referenced product or service names and trademarks are the property of their respective owners.

We Listen to Your Comments Any information within this document that you feel is wrong, unclear or missing at all? Your feedback will help us to continuously improve the quality of this document. Please send your proposal (including a reference to this document) to: **erratum@infineon.com**

Published by
Infineon Technologies AG
81726 München, Germany
© 2025 Infineon Technologies AG
All Rights Reserved.

Legal Disclaimer
The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics (“Beschaffenheitsgarantie”) . With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer’s compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer’s products and any use of the product of Infineon Technologies in customer’s applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer’s technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

Information
For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office (www.infineon.com).

Warnings
Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.
The Infineon Technologies component described in this Data Sheet may be used in life-support devices or systems and/or automotive, aviation and aerospace applications or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support, automotive, aviation and aerospace device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.