NGTD20T120F2

IGBT Die

Trench Field Stop II IGBT Die for motor drive and inverter applications.

Features

- Extremely Efficient Trench with Field Stop Technology
- Low $V_{CE(sat)}$ Loss Reduces System Power Dissipation

Typical Applications

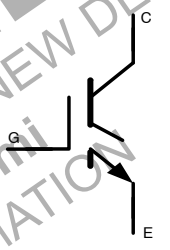
- Industrial Motor Drives
- Solar Inverters
- UPS Systems
- Welding

ON Semiconductor®

www.onsemi.com

V_{RCE} = 1200 V
I_C = Limited by $T_{J(max)}$

IGBT DIE



MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Collector−Emitter Voltage, T_J = 25°C	V_{CE}	1200	V
DC Collector Current, limited by $T_{J(max)}$	I_C	(Note 1)	A
Pulsed Collector Current (Note 2)	$I_{C, pulse}$	100	A
Gate−Emitter Voltage	V_{GE}	±20	V
Maximum Junction Temperature	T_J	−55 to +175	°C
Short Circuit Withstand Time, V_{GE} = 15 V, V_{CE} = 500V, $T_J \le$ 150°C	T_{SC}	10	μs

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Depending on thermal properties of assembly.
2. T_{pulse} limited by T_{jmax}, 10 μs pulse, V_{GE} = 15 V.

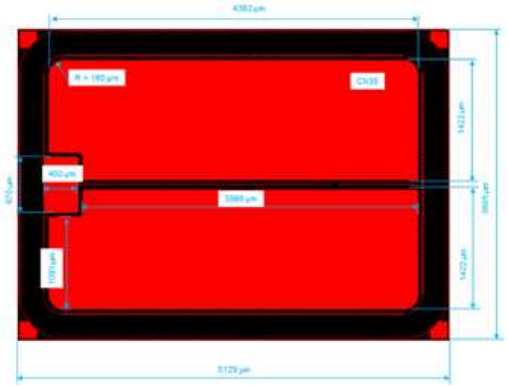
MECHANICAL DATA

Parameter	Value	Unit
Die Size	5129 x 3695	μm^2
Emitter Pad Size	See die layout	μm^2
Gate Pad Size	400 x 670	μm^2
Die Thickness	5	mils
Wafer Size	150	mm
Top Metal	5 μm AlSi	
Back Metal	2 μm TiNiAg	
Max possible chips per wafer	766	
Passivation frontside	Oxide−Nitride	
Reject ink dot size	25 mils	
Recommended storage environment: In original container, in dry nitrogen, or temperature of 18−28°C, 30−65%RH	Type: Bare Wafer in Jar Storage time: < 36 months	Type: Die on tape in ring−pack Storage time: < 3 months

ORDERING INFORMATION

Device	Inking?	Shipping
NGTD20T120F2WP	Yes	Bare Wafer in Jar
NGTD20T120F2SWK	Yes	Sawn Wafer on Tape

DIE OUTLINE



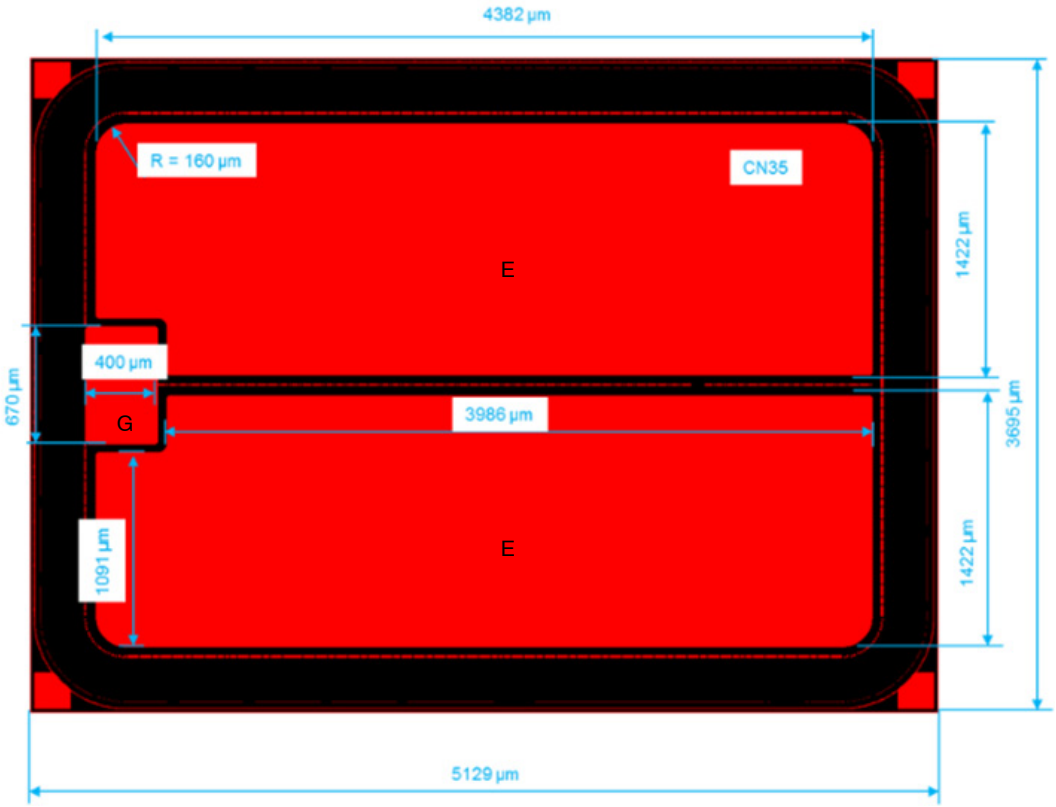
DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi REPRESENTATIVE FOR INFORMATION

ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Units
STATIC CHARACTERISTICS						
Collector−Emitter Breakdown Voltage	V_{GE} = 0 V, I_C = 500 μA	$V_{(BR)CES}$	1200			V
Collector−Emitter Saturation Voltage	V_{GE} = 15 V, I_C = 20 A	$V_{CE(sat)}$		2.0	2.4	V
Gate−Emitter Threshold Voltage	V_{GE} = V_{CE}, I_C = 400 μA	$V_{GE(TH)}$	4.5	5.5	6.5	V
Collector−Emitter Cutoff Current	V_{GE} = 0 V, V_{CE} = 1200 V	I_{CES}			0.4	mA
Gate Leakage Current	V_{GE} = 20 V, V_{CE} = 0 V	I_{GES}			200	nA
DYNAMIC CHARACTERISTICS						
Input Capacitance	V_{CE} = 20 V, V_{GE} = 0 V, f = 1 MHz	C_{ies}		4420		pF
Output Capacitance		C_{oes}		151		pF
Reverse Transfer Capacitance		C_{res}		81		pF

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

DIE LAYOUT



E = Emitter pad
G = Gate pad
All dimensions in μm

Further Electrical Characteristic

Switching characteristics and thermal properties are depending strongly on module design and mounting technology and can therefore not be specified for a bare die.

onsemi, ONSEMI , and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent−Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as−is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales