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

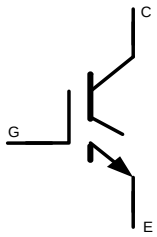
- Industrial Motor Drives
- Solar Inverters
- UPS Systems
- Welding

ON Semiconductor®

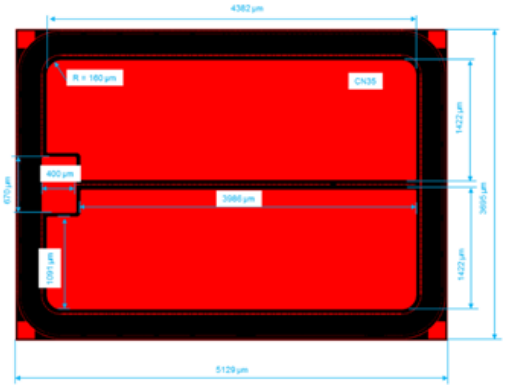
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V_{RCE} = 1200 V
I_C = Limited by $T_{J(max)}$

IGBT DIE



DIE OUTLINE



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

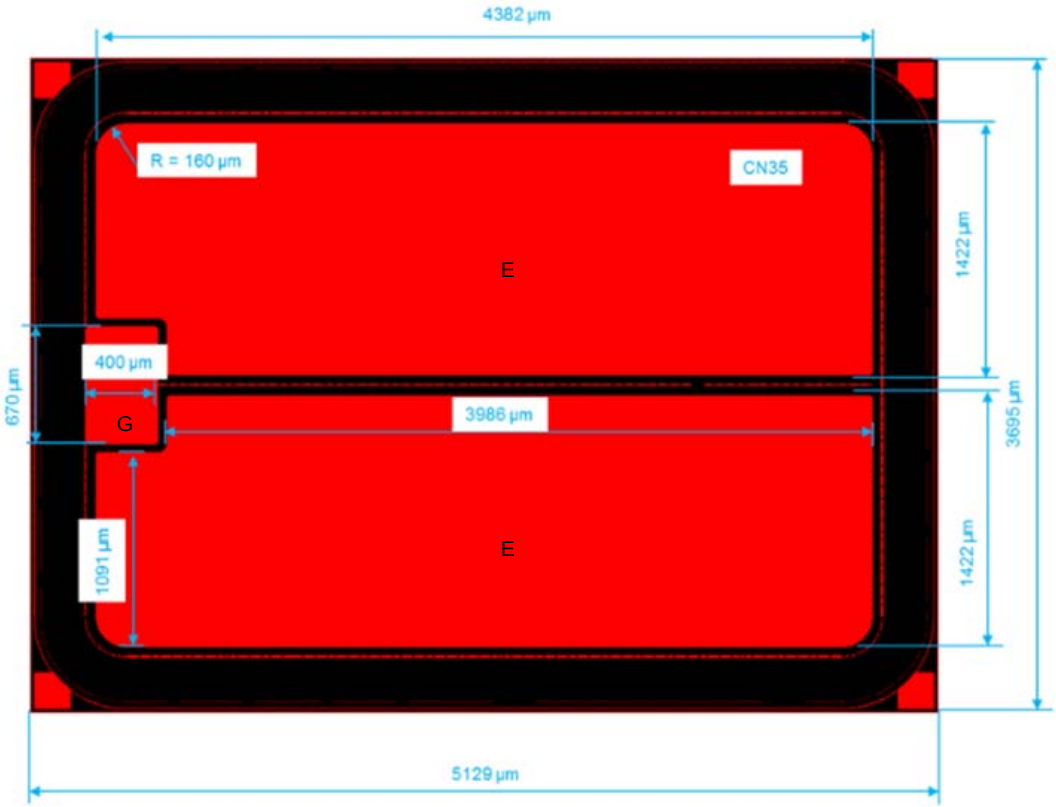
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ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

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.

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