NGTD13T65F2

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

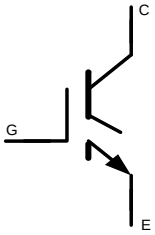
- Industrial Motor Drives
- Solar Inverters
- UPS Systems
- Welding

ON Semiconductor®

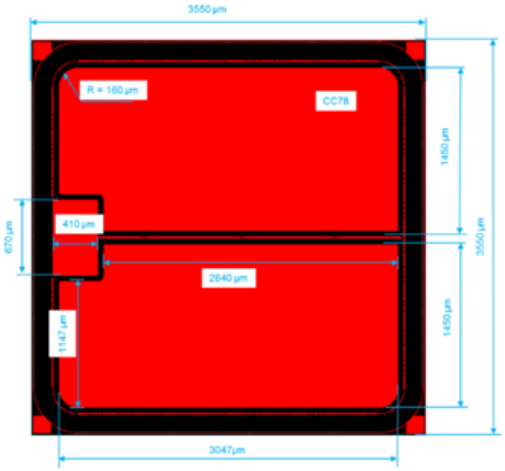
www.onsemi.com

V_{RCE} = 650 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}	650	V
DC Collector Current, limited by $T_{J(max)}$	I_C	(Note 1)	A
Pulsed Collector Current (Note 2)	$I_{C, pulse}$	120	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} = 400V, $T_J \le$ 150°C	T_{SC}	5.0	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}, 5.0 µs pulse, V_{GE} = 15 V.

MECHANICAL DATA

Parameter	Value	Unit
Die Size	3550 x 3550	μm^2
Emitter Pad Size	See die layout	μm^2
Gate Pad Size	410 x 670	μm^2
Die Thickness	3	mils
Wafer Size	150	mm
Top Metal	4 µm AISI	
Back Metal	2 µm TiNiAg	
Max possible chips per wafer	996	
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: Die on tape in ring−pack Storage time: < 3 months	

ORDERING INFORMATION

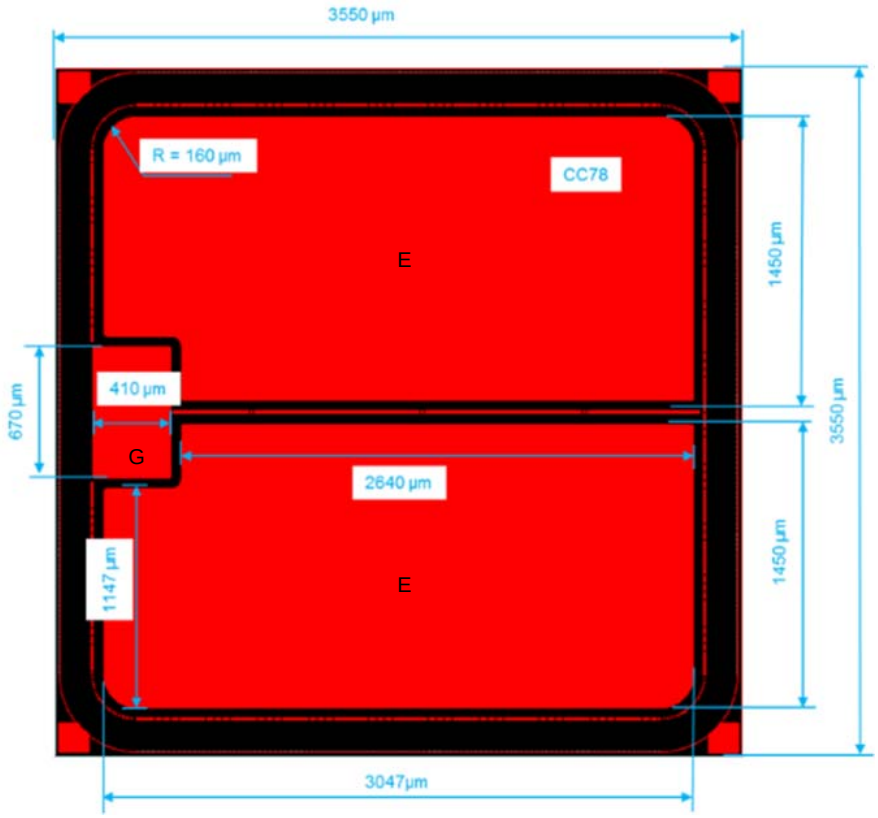
Device	Inking?	Shipping
NGTD13T65F2WP	Yes	Bare Wafer on Tape
NGTD13T65F2SWK	Yes	Sawn Wafer on Tape

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	$V_{(BR)CES}$	650			V
Collector−Emitter Saturation Voltage	V_{GE} = 15 V, I_C = 30 A	$V_{CE(sat)}$		1.6	2.2	V
Gate−Emitter Threshold Voltage	V_{GE} = V_{CE}, I_C = 350 μA	$V_{GE(TH)}$	4.5	5.5	6.5	V
Collector−Emitter Cutoff Current	V_{GE} = 0 V, V_{CE} = 650 V	I_{CES}			0.2	mA
Gate Leakage Current	V_{GE} = 20 V, V_{CE} = 0 V	I_{GES}			100	nA
DYNAMIC CHARACTERISTICS						
Input Capacitance	V_{CE} = 20 V, V_{GE} = 0 V, f = 1 MHz	C_{ies}		3200		pF
Output Capacitance		C_{oes}		130		pF
Reverse Transfer Capacitance		C_{res}		85		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

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