

IGBT Die

Features

- ## Typical Applications

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

Parameter	Symbol	Value	Unit
Collector–Emitter Voltage, $T_J = 25^{\circ}\text{C}$	V_{CE}	650	V
DC Collector Current, limited by $T_{J(\text{max})}$	I_C	(Note 1)	A
Pulsed Collector Current (Note 2)	$I_{C, \text{pulse}}$	120	A
Gate–Emitter Voltage	V_{GE}	± 20	V
Maximum Junction Temperature	T_J	-55 to $+175$	$^{\circ}\text{C}$
Short Circuit Withstand Time, $V_{GE} = 15 \text{ V}$, $V_{CE} = 400\text{V}$, $T_J \leq 150^{\circ}\text{C}$	T_{SC}	5.0	μs

1. Depending on thermal properties of assembly.
2. T_{pulse} limited by T_{imax} , 5.0 μs pulse, $V_{\text{GE}} = 15 \text{ V}$.

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 AlSi	
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: Bare Wafer in Jar Storage time: < 36 months	Type: Die on tape in ring-pack Storage time: < 3 months

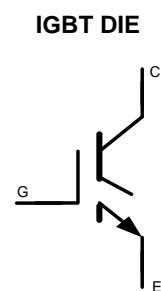
Device	Inking?	Shipping
NGTD13T65F2WP	Yes	Bare Wafer in Jar
NGTD13T65F2SWK	Yes	Sawn Wafer on Tape



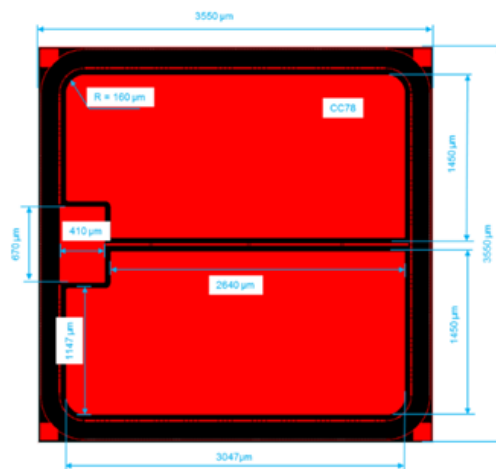
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$V_{RCE} = 650 \text{ V}$
 $I_C = \text{Limited by } T_{J(\text{max})}$



DIE OUTLINE



NGTD13T65F2

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

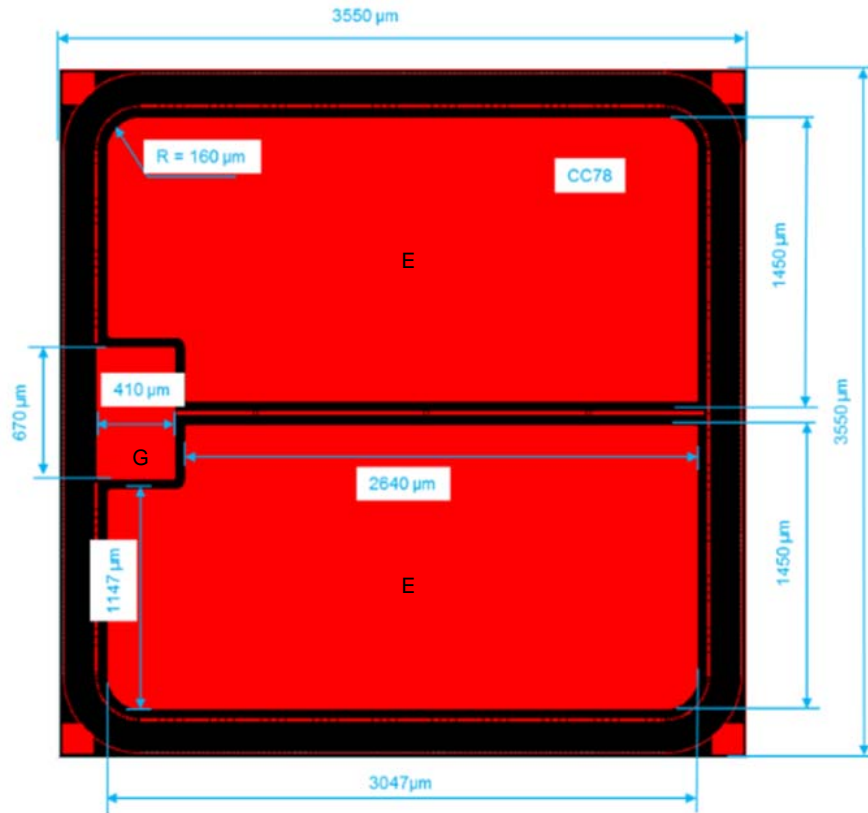
Parameter	Test Conditions	Symbol	Min	Typ	Max	Units
STATIC CHARACTERISTICS						
Collector–Emitter Breakdown Voltage	$V_{GE} = 0\text{ V}$, $I_C = 500\text{ }\mu\text{A}$	$V_{(BR)CES}$	650			V
Collector–Emitter Saturation Voltage	$V_{GE} = 15\text{ V}$, $I_C = 30\text{ A}$	$V_{CE(sat)}$		1.6	2.2	V
Gate–Emitter Threshold Voltage	$V_{GE} = V_{CE}$, $I_C = 350\text{ }\mu\text{A}$	$V_{GE(TH)}$	4.5	5.5	6.5	V
Collector–Emitter Cutoff Current	$V_{GE} = 0\text{ V}$, $V_{CE} = 650\text{ V}$	I_{CES}			0.2	mA
Gate Leakage Current	$V_{GE} = 20\text{ V}$, $V_{CE} = 0\text{ V}$	I_{GES}			100	nA

DYNAMIC CHARACTERISTICS

Input Capacitance	$V_{CE} = 20\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$	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

NGTD13T65F2

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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