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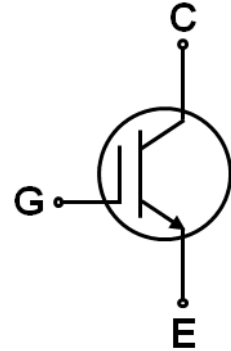
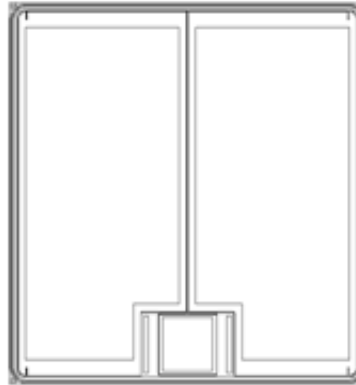


PCGA200T65NF8

650 V, 200 A Field Stop Trench IGBT

Features

- AEC-Q101 Qualified
- Max Junction Temperature 175°C
- Positive Temperature Co-efficient
- Ease of Paralleling
- Short Circuit Rated
- Very Low Saturation Voltage: $V_{CE(SAT)} = 1.53V$ (Typ.) @ $I_C = 200A$
- Optimized for Motor Control Applications



Applications

- Automotive Traction Modules
- General Power Modules

Ordering Information

P/N	PCGA200T65NF8	
Packing	Wafer (Sawn-On-Foil)	
	mils	μm
Die Size	394 X 394	10,000 X 10,000
Emitter Attach Area	2 x (169 x 340)	2 x (4,300 x 8,640)
Gate pad Attach Area	55 x 55	1,400 x 1,400
Die thickness	3	78
Top Metal	Al (0.5% Cu, 0.8% Si)	
Back Metal	Al/VNi/Ag	
Topside Passivation	Silicon Nitride Plus Polyimide	
Wafer diameter	200mm	
Max Possible Die Per Wafer	234	

Absolute Maximum Ratings ($T_{VJ} = 25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{CES}	Collector to Emitter Voltage	650	V
V_{GES}	Gate-to-Emitter Voltage	± 20	V
I_C	Collector Current, limited by T_{VJ} max	(Note 1)	A
I_{CM}	Pulsed Collector Current, $V_{GE} = 15\text{V}$, limited by T_{VJ} max	600	A
S_{CWT}	Short Circuit Withstand Time, $V_{GE} = 15\text{V}$, $V_{CE} \leq 400\text{V}$, $T_{VJ} \leq 150^{\circ}\text{C}$	5	μs
T_{VJ}	Operating Junction Temperature	-40 to +175	$^{\circ}\text{C}$
T_{stg}	Storage Temperature Range	+17 to +25	$^{\circ}\text{C}$

Notes:

1: Depends on the thermal properties of assembly

Electrical Characteristics of the IGBT ($T_{VJ} = 25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
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Static Characteristics (Tested on wafers)

$B_{V_{CES}}$	Collector to Emitter Breakdown Voltage	$V_{GE} = 0\text{V}$, $I_C = 1\text{mA}$	650	-	-	V
$V_{CE(SAT)}$	Collector to Emitter Saturation Voltage	$I_C = 100\text{A}$, $V_{GE} = 15\text{V}$	-	1.25	1.75	V
$V_{GE(th)}$	G-E Threshold Voltage	$V_{GE} = V_{CE}$, $I_C = 200\text{mA}$	4.5	5.5	6.5	V
I_{CES}	Collector Cut-Off Current	$V_{CE} = V_{CES}$, $V_{GE} = 0\text{V}$	-	-	40	μA
I_{GES}	G-E Leakage Current	$V_{GE} = V_{GES}$, $V_{CE} = 0\text{V}$	-	-	± 400	nA

Electrical Characteristics (Not subject to production test, verified by design /characterization)

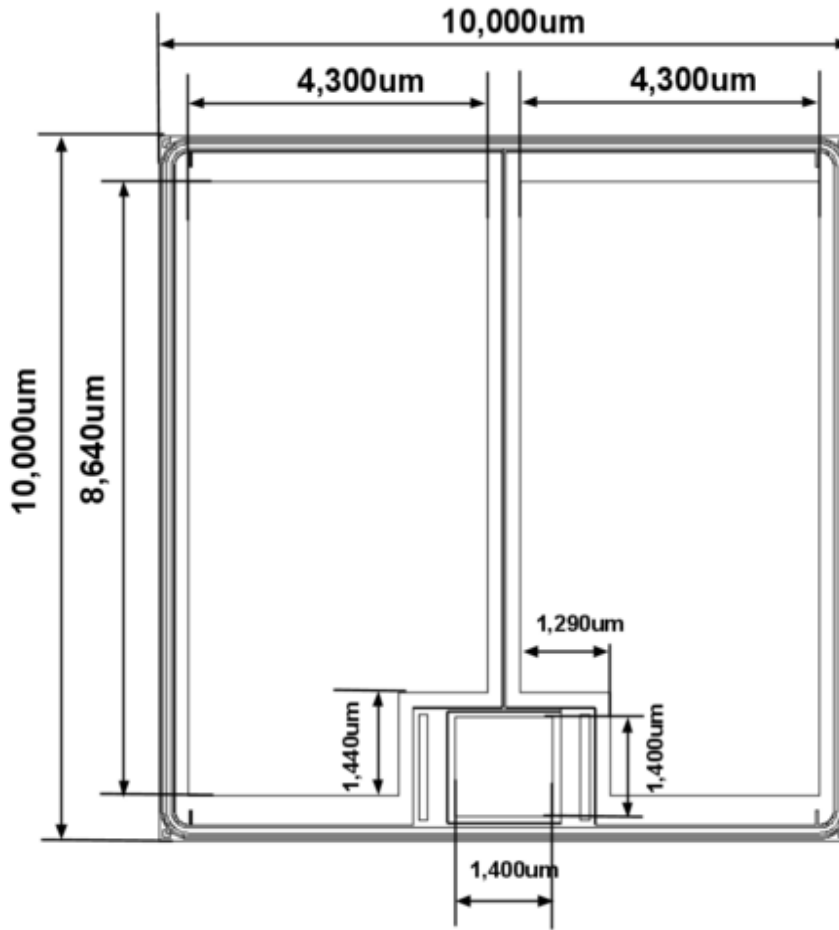
$V_{CE(SAT)}$	Collector to Emitter Saturation Voltage	$I_C = 200\text{A}$, $V_{GE} = 15\text{V}$	$T_{VJ} = 25^{\circ}\text{C}$	-	1.53	1.9	V
			$T_{VJ} = 175^{\circ}\text{C}$	-	2.04	-	V
C_{IES}	Input Capacitance	$V_{DS} = 30\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$	-	9600	-	pF	
C_{OES}	Output Capacitance		-	445	-	pF	
C_{RES}	Reverse Transfer Capacitance		-	78	-	pF	
R_G	Internal Gate Resistance		$f = 1\text{MHz}$	-	2.0	-	Ω
$Q_{G(ToT)}$	Total Gate Charge	$V_{CE} = 400\text{V}$, $I_C = 200\text{A}$ $V_{GE} = 15\text{V}$	-	229	-	nC	
Q_{GE}	Gate-to-Emitter Charge		-	66	-	nC	
Q_{GC}	Gate-to-Collector Charge		-	64	-	nC	
$t_{d(on)}$	Turn-On Delay Time	$V_{CE} = 400\text{V}$, $I_C = 200\text{A}$, $R_G = 5\Omega$, $V_{GE} = +15\text{V}$, Inductive Load $T_{VJ} = 25^{\circ}\text{C}$	-	67	-	ns	
t_r	Rise Time		-	233	-	ns	
$t_{d(off)}$	Turn-Off Delay Time		-	118	-	ns	
t_f	Fall Time		-	177	-	ns	
$t_{d(on)}$	Turn-On Delay Time	$V_{CE} = 400\text{V}$, $I_C = 200\text{A}$, $R_G = 5\Omega$, $V_{GE} = +15\text{V}$, Inductive Load $T_{VJ} = 175^{\circ}\text{C}$	-	64	-	ns	
t_r	Rise Time		-	236	-	ns	
$t_{d(off)}$	Turn-Off Delay Time		-	124	-	ns	
t_f	Fall Time		-	208	-	ns	

For ordering, technique and other information on Fairchild automotive bare die products, please contact automotivedie@fairchildsemi.com



Physical Dimensions Dimension is in micrometer unless otherwise noted






PCGA200T65NF8 650V, 200A Field Stop Trench IGBT





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Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
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