

TRENCHSTOP™ IGBT3 Chip

Features:

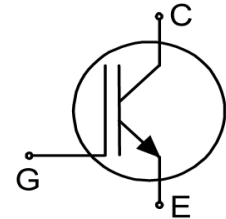
- 1700V trench & field stop technology
- Low turn-off losses
- Short tail current
- Positive temperature coefficient
- Easy paralleling

Recommended for:

- Power modules

Applications:

- Drives



Chip Type	V _{CE}	I _{Cn} ¹	Die Size	Package
SIGC158T170R3E	1700V	125A	12.57mm x 12.57mm	Sawn on foil

Mechanical Parameters

Die size	12.57 x 12.57		mm ²
Emitter pad size	See chip drawing		
Gate pad size	1.123 x 1.123		
Area total	158.0		
Thickness	190		µm
Wafer size	200		mm
Maximum possible chips per wafer	159		
Passivation frontside	Photoimide		
Pad metal	3200nm AlSiCu		
Backside metal	Ni Ag – system To achieve a reliable solder connection it is strongly recommended not to consume the Ni layer completely during production process		
Die bond	Electrically conductive epoxy glue and soft solder		
Wire bond	Al, ≤500µm		
Reject ink dot size	Ø 0.65mm; max. 1.2mm		
Storage environment	for original and sealed MBB bags	Ambient atmosphere air, temperature 17°C – 25°C, <6 months	
	for open MBB bags	Acc. to IEC62258-3: atmosphere >99% Nitrogen or inert gas, humidity <25%RH, temperature 17°C – 25°C, <6 months	

¹ Nominal collector current at T_C = 100°C assuming chip assembly in power module EconoPACK™ +

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage, $T_{vj}=25^{\circ}\text{C}$	V_{CE}	1700	V
DC collector current, limited by $T_{vj\text{ max}}^2$	I_C	-	A
Pulsed collector current, t_p limited by $T_{vj\text{ max}}^3$	$I_{C,puls}$	375	A
Gate-emitter voltage	V_{GE}	± 20	V
Junction temperature range	T_{vj}	-40 ... +175	$^{\circ}\text{C}$
Operating junction temperature	T_{vj}	-40 ... +150	$^{\circ}\text{C}$
Short circuit data ^{3/4} $V_{GE}=15\text{V}$, $V_{CC}=1000\text{V}$, $T_{vj}=150^{\circ}\text{C}$	t_{sc}	10	μs
Reverse bias safe operating area ³ (RBSOA)	$I_{C,max}=250\text{A}$, $V_{CE,max}=1700\text{V}$, $T_{vj}\leq 150^{\circ}\text{C}$		

Static Characteristics (tested on wafer), $T_{vj}=25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0\text{V}$, $I_C=3.8\text{mA}$	1700	-	-	V
Collector-emitter saturation voltage	V_{CEsat}	$V_{GE}=15\text{V}$, $I_C=37.5\text{A}$	1.1	1.27	1.45	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=6\text{mA}$, $V_{GE}=V_{CE}$	5.2	5.8	6.4	
Zero gate voltage collector current	I_{CES}	$V_{CE}=1700\text{V}$, $V_{GE}=0\text{V}$	-	-	6.9	μA
Gate-emitter leakage current	I_{GES}	$V_{CE}=0\text{V}$, $V_{GE}=20\text{V}$	-	-	600	nA
Integrated gate resistor	r_G		5			Ω

Electrical Characteristics ³

Parameter	Symbol	Conditions	Value			Unit	
			min.	typ.	max.		
Collector-emitter saturation voltage	V_{CEsat}	$V_{GE}=15\text{V}$, $I_C=125\text{A}$	$T_{vj}=25^{\circ}\text{C}$	1.6	2	2.4	V
			$T_{vj}=125^{\circ}\text{C}$	-	2.4	-	
Input capacitance	C_{ies}	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$ $T_{vj}=25^{\circ}\text{C}$	-	11001	-	pF	
Reverse transfer capacitance	C_{res}		-	365	-		

² Depending on thermal properties of assembly.

³ Not subject to production test - verified by design/characterization.

⁴ Allowed number of short circuits: <1000; time between short circuits: >1s.