

TRENCHSTOP™ IGBT3 Chip

Features:

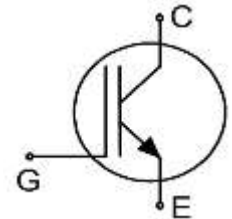
- 600V trench & field stop technology
- Low V_{CEsat}
- Low turn-off losses
- Short tail current
- Positive temperature coefficient
- Easy paralleling

Recommended for:

- Power modules
- Discrete components

Applications:

- Drives
- White goods
- Resonant applications



Chip Type	V_{CE}	I_{Cn}	Die Size	Package
SIGC39T60E	600V	75A	6.59mm x 5.91mm	Sawn on foil

Mechanical Parameters

Die size	6.59 x 5.91	mm ²
Emitter pad size	See chip drawing	
Gate pad size	1.52 x 0.82	
Area total	38.95	
Silicon thickness	70	μm
Wafer size	200	mm
Maximum possible chips per wafer	686	
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	∅ 0.65mm; max. 1.2mm	
Storage environment (<6 months)	for original and sealed MBB bags	Ambient atmosphere air, temperature 17°C – 25°C
	for open MBB bags	Acc. IEC 62258-3; Section 9.4 Storage Environment.

Maximum Ratings

In general, from reliability and lifetime point of view, the lower the operation junction temperature and/or the applied voltage, the greater the expected lifetime of any semiconductor device.

Parameter	Symbol	Value	Unit
Collector-emitter voltage, $T_{vj}=25^{\circ}\text{C}$	V_{CE}	600	V
DC collector current, limited by $T_{vj\text{ max}}^1$	I_C	-	A
Pulsed collector current, t_p limited by $T_{vj\text{ max}}^2$	$I_{C,puls}$	225	A
Gate-emitter voltage	V_{GE}	± 20	V
Virtual junction temperature	T_{vj}	-40 ... +175	$^{\circ}\text{C}$
Short circuit data ^{1/2/3} $V_{GE}=15\text{V}$, $V_{CC}=360\text{V}$, $T_{vj}=150^{\circ}\text{C}$	t_{sc}	6	μs
Reverse bias safe operating area (RBSOA) ²	$I_{C,max} = 150\text{A}$, $V_{CEmax} = 600\text{V}$, $T_{vj} \leq 150^{\circ}\text{C}$		

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

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	$V_{GE}=0\text{V}$, $I_C=4\text{mA}$	600	-	-	V
Collector-emitter saturation voltage	V_{CEsat}	$V_{GE}=15\text{V}$, $I_C=75\text{A}$	1.05	1.45	1.85	
Gate-emitter threshold voltage	$V_{GE(th)}$	$I_C=1.2\text{mA}$, $V_{GE}=V_{CE}$	5.0	5.8	6.5	
Zero gate voltage collector current	I_{CES}	$V_{CE}=600\text{V}$, $V_{GE}=0\text{V}$	-	-	3.8	μA
Gate-emitter leakage current	I_{GES}	$V_{CE}=0\text{V}$, $V_{GE}=20\text{V}$	-	-	600	nA
Integrated gate resistor	r_G		none			Ω

Electrical Characteristics ²

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Input capacitance	C_{ies}	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$ $T_{vj}=25^{\circ}\text{C}$	-	4620	-	pF
Output capacitance	C_{oes}		-	288	-	
Reverse transfer capacitance	C_{res}		-	137	-	

¹ Depending on thermal properties of assembly.

² Not subject to production test - verified by design/characterization.

³ Allowed number of short circuits: <1000; time between short circuits: >1s.