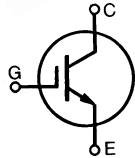
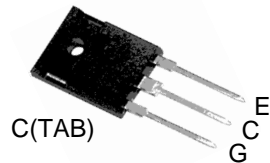


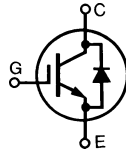
# SG20N12T, SG20N12DT

## Discrete IGBTs



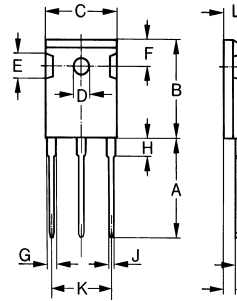
SG20N12T

G=Gate, C=Collector,  
E=Emitter, TAB=Collector



SG20N12DT

Dimensions TO-247AD



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

Symbol	Test Conditions	Maximum Ratings	Unit
$V_{CES}$ $V_{CGR}$	$T_J=25^{\circ}\text{C}$ to $150^{\circ}\text{C}$ $T_J=25^{\circ}\text{C}$ to $150^{\circ}\text{C}$ ; $R_{GE}=1\text{ M}\Omega$ ;	1200 1200	V
$V_{GES}$ $V_{GEM}$	Continuous Transient	$\pm 20$ $\pm 30$	V
$I_{C25}$ $I_{C90}$ $I_{CM}$	$T_C=25^{\circ}\text{C}$ $T_C=90^{\circ}\text{C}$ $T_C=25^{\circ}\text{C}$ , 1 ms	40 20 80	A
<b>SSOA</b> <b>(RBSOA)</b>	$V_{GE}=15\text{V}$ ; $T_{VJ}=125^{\circ}\text{C}$ ; $R_G=47\Omega$ Clamped inductive load	$I_{CM}=40$ @ 0.8 $V_{CES}$	A
$P_c$	$T_C=25^{\circ}\text{C}$	150	W
$T_J$ $T_{JM}$ $T_{stg}$		-55...+150 150 -55...+150	$^{\circ}\text{C}$
	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10s Maximum Tab temperature for soldering SMD devices for 10s	300 260	$^{\circ}\text{C}$ $^{\circ}\text{C}$
$M_d$	Mounting torque (M3)	1.13/10	Nm/lb.in.
<b>Weight</b>		6	g

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

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
$BV_{CES}$	$I_C=1\text{mA}$ ; $V_{GE}=0\text{V}$	1200			V
$V_{GE(th)}$	$I_C=250\mu\text{A}$ ; $V_{CE}=V_{GE}$	2.5		5.0	V
$I_{CES}$	$V_{CE}=V_{CES}$ ; $T_J=25^{\circ}\text{C}$ $V_{GE}=0\text{V}$ ; $T_J=125^{\circ}\text{C}$			250 1	$\mu\text{A}$ mA
$I_{GES}$	$V_{CE}=0\text{V}$ ; $V_{GE}=\pm 20\text{V}$			$\pm 100$	nA
$V_{CE(sat)}$	$I_C=I_{C90}$ ; $V_{GE}=15\text{V}$		2.0	2.5	V

**Sirectifier**®

# SG20N12T, SG20N12DT

## Discrete IGBTs

(T<sub>J</sub>=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
g <sub>ts</sub>	I <sub>C</sub> =I <sub>C90</sub> ; V <sub>CE</sub> =10V Pulse test, t ≤ 300us, duty cycle ≤ 2%	12	16		S
C <sub>ies</sub> C <sub>oes</sub> C <sub>res</sub>	V <sub>CE</sub> =25V; V <sub>GE</sub> =0V; f=1MHz		1750 90 31		pF
Q <sub>g</sub> Q <sub>ge</sub> Q <sub>gc</sub>	I <sub>C</sub> =I <sub>C90</sub> ; V <sub>GE</sub> =15V; V <sub>CE</sub> =0.5V <sub>CES</sub>		63 13 26		nC
t <sub>d(on)</sub> t <sub>ri</sub> t <sub>d(off)</sub> t <sub>fi</sub> E <sub>off</sub>	Inductive load, T <sub>J</sub> =25°C I <sub>C</sub> =I <sub>C90</sub> ; V <sub>GE</sub> =15V; L=100uH; V <sub>CE</sub> =0.8V <sub>CES</sub> ; R <sub>G</sub> =R <sub>off</sub> =47 Ω Remarks: Switching times may increase for V <sub>CE</sub> (Clamp) > 0.8V <sub>CES</sub> ; higher T <sub>J</sub> or increased R <sub>G</sub>		28 20 400 380 6.5	800 700 10.5	ns ns ns ns mJ
t <sub>d(on)</sub> t <sub>ri</sub> E <sub>on</sub> t <sub>d(off)</sub> t <sub>fi</sub> E <sub>off</sub>	Inductive load, T <sub>J</sub> =125°C I <sub>C</sub> =I <sub>C90</sub> ; V <sub>GE</sub> =15V; L=100uH; V <sub>CE</sub> =0.8V <sub>CES</sub> ; R <sub>G</sub> =R <sub>off</sub> =47 Ω Remarks: Switching times may increase for V <sub>CE</sub> (Clamp) > 0.8V <sub>CES</sub> ; higher T <sub>J</sub> or increased R <sub>G</sub>		30 27 0.90 700 550 9.5		ns ns mJ ns ns mJ
R <sub>thJC</sub>				0.83	K/W
R <sub>thCK</sub>			0.25		K/W

### Reverse Diode (FRED)

(T<sub>J</sub>=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
V <sub>F</sub>	I <sub>F</sub> =12A; T <sub>VJ</sub> =150°C T <sub>VJ</sub> =25°C			1.87 2.15	V
I <sub>RM</sub>	V <sub>R</sub> =540V; I <sub>F</sub> =20A; -di <sub>F</sub> /dt=100A/us L ≤ 0.05uH; T <sub>VJ</sub> =100°C		7		A
t <sub>rr</sub>	I <sub>F</sub> =1A; -di <sub>F</sub> /dt=100A/us; V <sub>R</sub> =30V; T <sub>VJ</sub> =25°C		40	60	ns
R <sub>thJC</sub>				1.6	K/W

