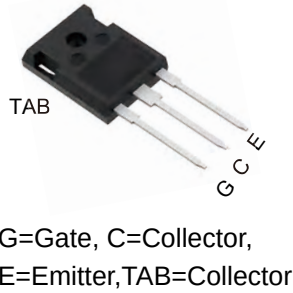


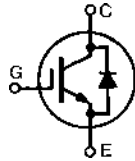
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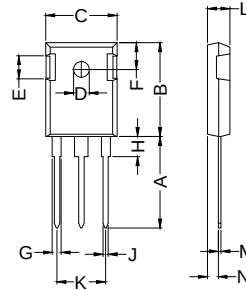
$$\begin{aligned} V_{CES} &= 1200V \\ I_{C100} &= 25A \\ V_{CE(sat)} &\leq 1.95V \\ t_{fi(typ)} &= 75ns \end{aligned}$$



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



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	0.620	0.640
ØD	3.15	3.65	0.124	0.144
E	4.32	5.49	0.170	0.216
F	5.40	6.30	0.213	0.248
G	1.65	2.18	0.065	0.086
H	3.80	4.50	0.150	0.177
J	1.00	1.40	0.039	0.055
K	10.80	11.10	0.425	0.437
L	4.70	5.30	0.185	0.209
M	0.40	0.80	0.016	0.031
N	1.50	2.49	0.059	0.098

IGBT

Symbol	Test Conditions	Maximum Ratings	Unit
V_{CES} V_{CGR}	$T_J=25^{\circ}C$ to $150^{\circ}C$ $T_J=25^{\circ}C$ to $150^{\circ}C$; $R_{GE}=1\text{ M}\Omega$;	1200 1200	V
V_{GES} V_{GEM}	Continuous Transient	± 20 ± 30	V
I_{C25} I_{C100} I_{CM}	$T_C=25^{\circ}C$; limited by leads $T_C=100^{\circ}C$ $T_C=25^{\circ}C$, 1 ms	50 25 75	A
SSOA (RBSOA)	$V_{GE}=15V$; $T_{VJ}=125^{\circ}C$; $R_G=5\Omega$ Clamped inductive load	$I_{CM}=120$ @ 0.8 V_{CES}	A
P_C	$T_C=25^{\circ}C$	208	W
T_J T_{JM} T_{stg}		-55...+150 150 -55...+150	$^{\circ}C$
	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	$^{\circ}C$ $^{\circ}C$
M_d	Mounting torque (M3)	1.13/10	Nm/lb.in.
Weight	Typical	6	g

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

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
BV_{CES}	$I_C=1mA$; $V_{GE}=0V$	1200			V
$V_{GE(th)}$	$I_C=750\mu A$; $V_{CE}=V_{GE}$	4.5	5.8	7.5	V
I_{CES}	$V_{CE}=V_{CES}$; $T_J=25^{\circ}C$			750	μA
	$V_{GE}=0V$; $T_J=125^{\circ}C$			4	mA
I_{GES}	$V_{CE}=0V$; $V_{GE}=\pm 20V$			± 200	nA
$V_{CE(sat)}$	$I_C=I_{C90}$; $V_{GE}=15V$		1.95	2.5	V

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(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
g _{ts}	I _C =I _{C90} ; V _{CE} =10V Pulse test, t ≤ 300us, duty cycle ≤ 2%	33	44		S
I _{C(ON)}	V _{GE} =10V; V _{CE} =10V		120		A
C _{ies} C _{oes} C _{res}	V _{CE} =25V; V _{GE} =0V; f=1MHz		2370 59 43		pF
Q _g Q _{ge} Q _{gc}	I _C =I _{C90} ; V _{GE} =15V; V _{CE} =0.5V _{CES}		142 23 75		nC
t _{d(on)} t _{ri} t _{d(off)} t _{fi} E _{off}	Inductive load, T _J =25°C I _C =I _{C90} ; V _{GE} =15V; V _{CE} =0.5V _{CES} ; R _G =R _{off} =10Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8V _{CES} higher T _J or increased R _G		34 36 198 75 0.95		ns ns ns ns mJ
t _{d(on)} t _{ri} E _{on} t _{d(off)} t _{fi} E _{off}	Inductive load, T _J =125°C I _C =I _{C90} ; V _{GE} =15V; V _{CE} =0.5V _{CES} ; R _G =R _{off} =10Ω Remarks: Switching times may increase for V _{CE} (Clamp) > 0.8V _{CES} higher T _J or increased R _G		50 40 3.8 400 160 2.5		ns ns mJ ns ns mJ
R _{thJC}				0.60	K/W
R _{thCK}			0.25		K/W

Reverse Diode (FRED)

(T_J=25°C, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values			Unit
		min.	typ.	max.	
V _F	I _F =25A; T _{VJ} =150°C T _{VJ} =25°C		2.7 3.0		V
I _{RM}	V _R =100V; I _F =25A; -di _F /dt=100A/us L ≤ 0.05uH; T _{VJ} =100°C		12		A
t _{rr}	I _F =1A; -di _F /dt=50A/us; V _R =30V; T _J =25°C		40		ns
R _{thJC}	Diode		1.1	1.2	K/W

Sirectifier®

SG25T120DB2

Discrete IGBTs

Features

- Trench Field Stop IGBT technology
- Low switching losses
- Switching frequency up to 20KHz
- Square RBSOA, no latch up
- High short circuit capability
- Positive temperature coefficient for easy paralleling
- MOS input, voltage controlled
- Ultra fast free wheeling diodes

Application

- AC and DC motor control
- AC servo and robot drives
- power supplies
- welding inverters

Advantages

- space and weight savings
- reduced protection circuits

Characteristics Curve

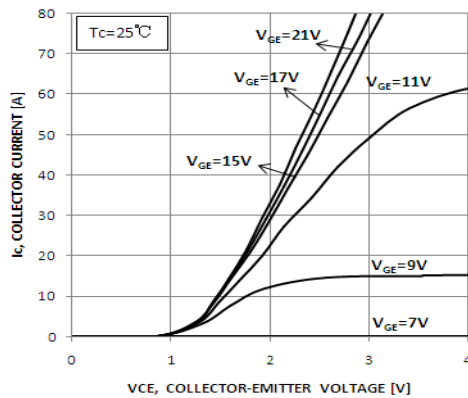


Figure 1. Typical Output Characteristics

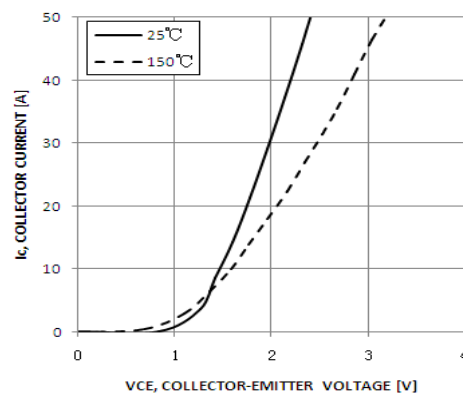


Figure 2. Typical Output Characteristics

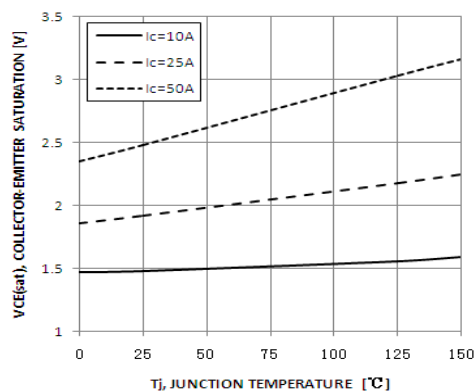


Figure 3. Typical Saturation Voltage vs. Junction Temperature

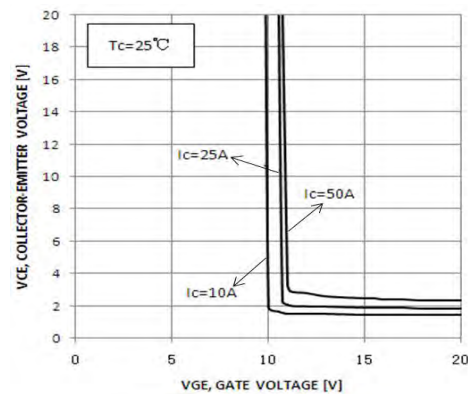


Figure 4. Typical Saturation Voltage vs. Gate-Emitter Voltage

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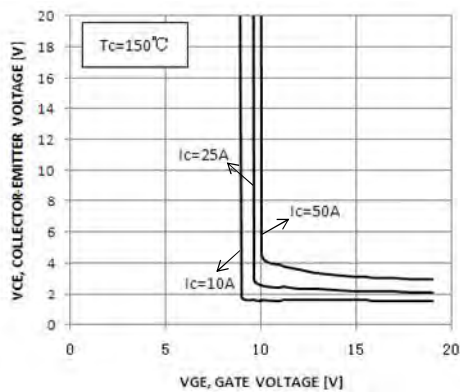


Figure 5. Typical Saturation Voltage vs. Gate-Emitter Voltage

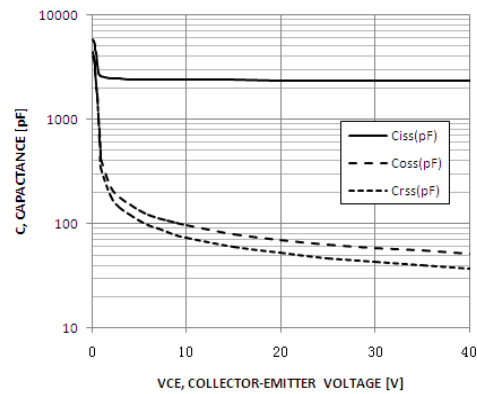


Figure 6. Typical Capacitance Characteristics

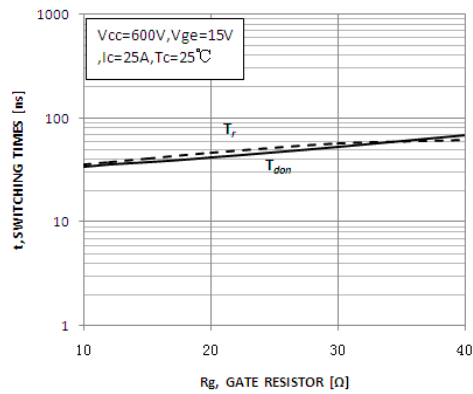


Figure 7. Typical Turn-On Characteristics vs. Gate Resistance

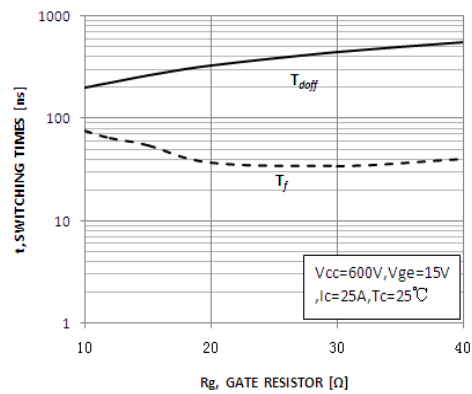


Figure 8. Typical Turn-Off Characteristics vs. Gate Resistance

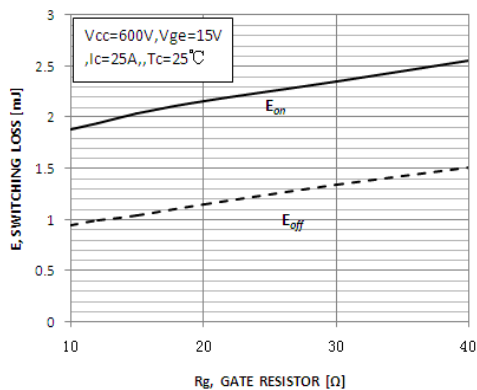


Figure 9. Typical Switching Losses vs. Gate Resistance

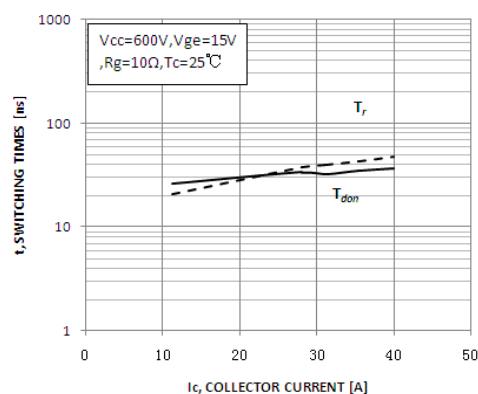


Figure 10. Typical Turn-On Characteristics vs. Collector Current

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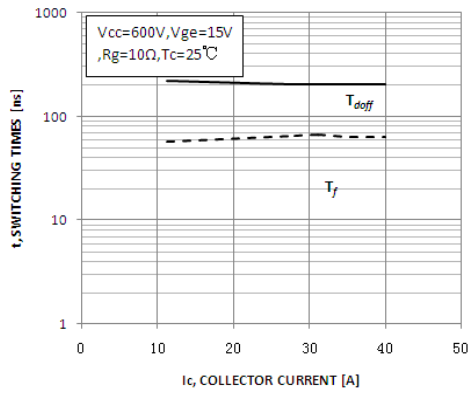


Figure 11. Typical Turn-Off Characteristics vs. Collector Current

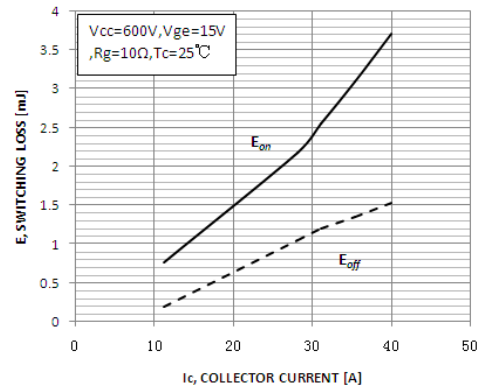


Figure 12. Typical Switching Losses vs. Collector Current

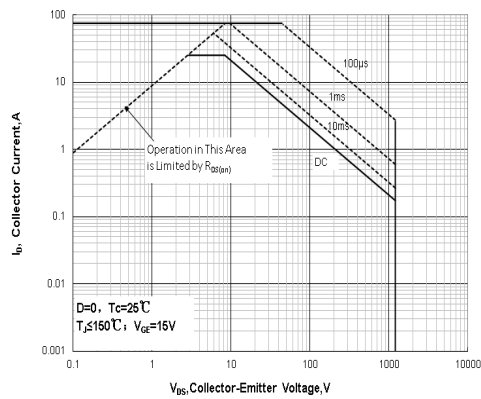


Figure 13. Typical IGBT Forward Safe Operating Area

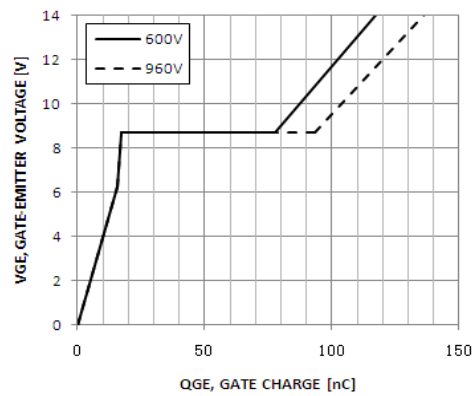


Figure 14. Typical Gate Charge

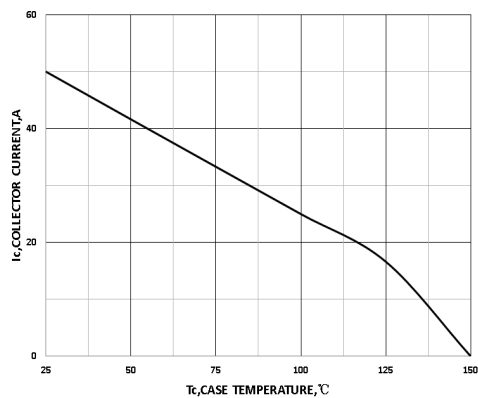


Figure 15. Collector Current vs. Case Temperature

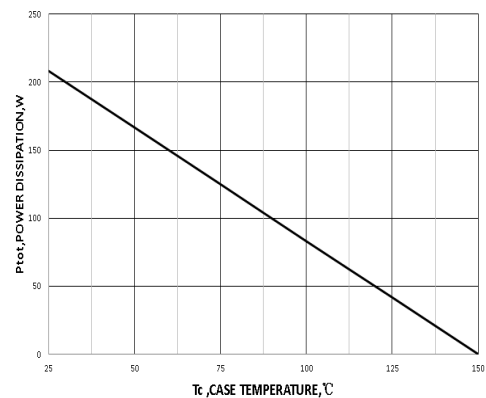


Figure 16. Power Dissipation vs. Case Temperature

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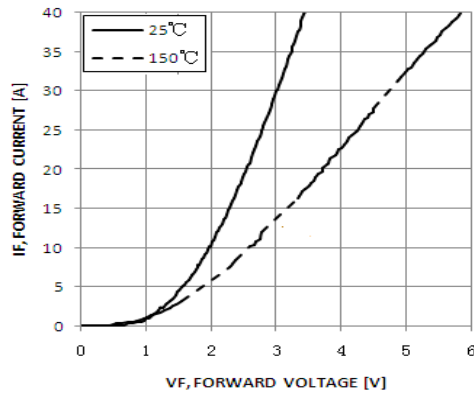


Figure 17. Typical Diode Forward Characteristics

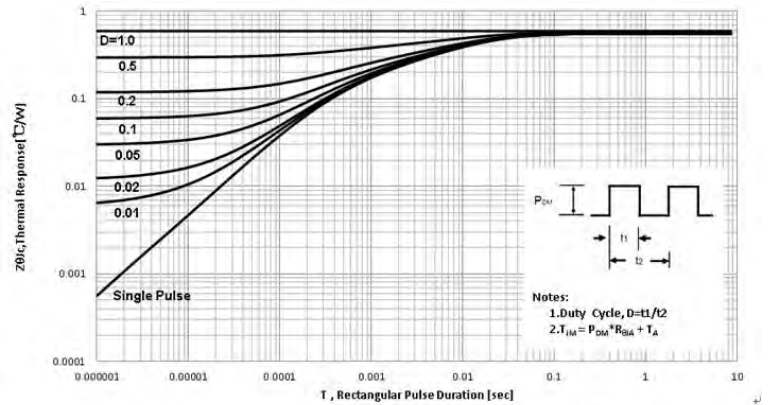


Figure 18. IGBT Transient Thermal Impedance

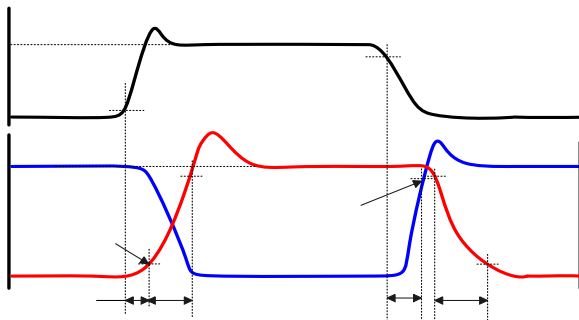


Figure A. Definition of switching times

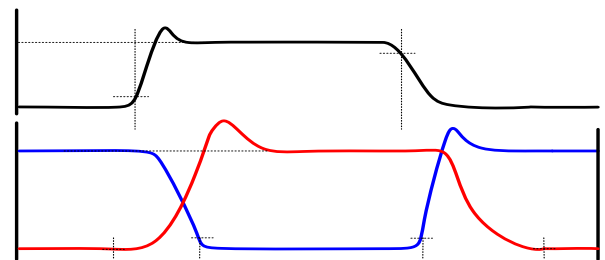


Figure B. Definition of switching losses

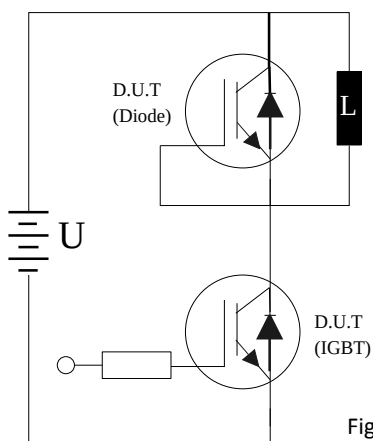


Figure D. Dynamic test circuit

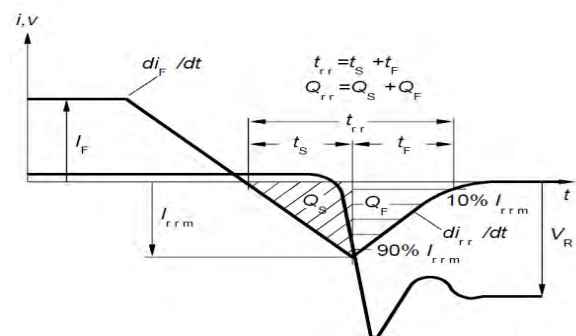
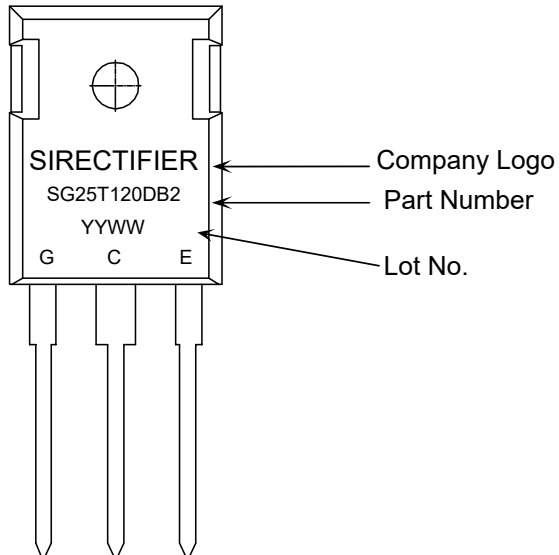


Figure C. Definition of diodes switching characteristics

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Discrete IGBTs

MARKING



ORDERING INFORMATION

Part Number	Package	Shipping	Marking Code
SG25T120DB2	TO-247AD	30pcs / Tube	SG25T120DB2