Features

- SiC MOSFET Technology
- High Blocking Voltage with Low On-resistance
- Low Capacitance
- Moisture Sensitivity Level 3
- Halogen Free. “Green” Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant (Note 2)("P" Suffix Designates RoHS Compliant. See Ordering Information)

N-CHANNEL MOSFET

Maximum Ratings

- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Typical Thermal Resistance: 1.29°C/W Junction to Case

Applications

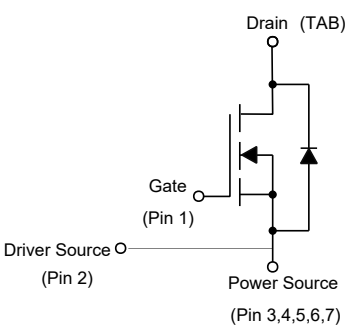
- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Power Factor Correction (PFC)
- Motor Drives

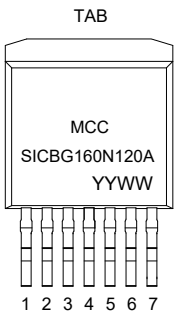
Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	1200	V
Gate-Source Voltage AC(f>1Hz)		V_{GSmax}	-5/+22	V
Gate-Source Voltage Static		V_{GSop}	-3/+18	V
Continuous Drain Current V_{GS}=18V	Tc=25°C	I_D	18	A
	Tc=100°C		12	
Pulsed Drain Current (Note 3)		I_{DM}	72	A
Single Pulse Avalanche Energy (Note4)		E_{AS}	216	mJ
Total Power Dissipation	Tc=25°C	P_D	116	W
	Tc=110°C		50	

Note:

1. Halogen free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemptions Applied, see EU Directive Annex 7a.
3. Pulse Test: Pulse Width Limited by Tjmax.
4. EAS Condition:T_J=25℃, V_{DD}=50V, V_{GS}=20V, R_g=25Ω, L=10mH, I_{AS}=6.6A.

Internal Structure

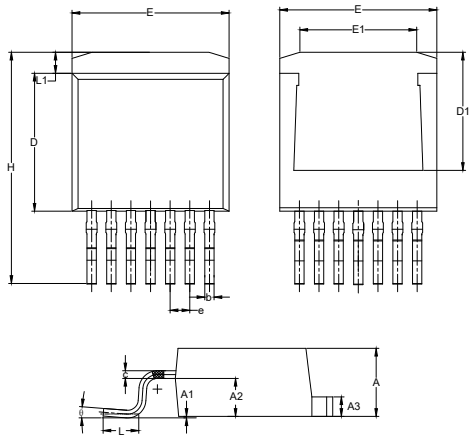




Device Code: SICBG160N120A

Date Code: YYWW (Year & Week)

TO-263-7L



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.167	0.183	4.24	4.64	
A1	0.000	0.010	0.00	0.25	
A2	0.096	0.108	2.45	2.75	
A3	0.045	0.055	1.15	1.40	
b	0.020	0.035	0.50	0.90	
c	0.017	0.024	0.45	0.60	
D	0.347	0.364	8.82	9.25	
D1	0.222		5.65		
E	0.392	0.408	9.96	10.36	
E1	0.256	0.310	6.50	7.89	
e	0.050		1.27		TYP.
H	0.575	0.625	14.61	15.88	
L	0.070	0.110	1.78	2.79	
L1	0.039	0.056	0.98	1.42	
θ	0°	8°	0°	8°	

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	1200			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =-5/+22V			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=1200V, V_{GS}=0V			10	μA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=2.5mA	1.5		3.0	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=20V, I_D=9A		118	140	mΩ
		V_{GS}=18V, I_D=9A		130	160	mΩ
		V_{GS}=16V, I_D=9A		150	180	mΩ
Internal Gate Resistance	R_g	f=1MHz		4.1		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S	V_{GS}=-3V		18		A
Diode Forward Voltage	V_{SD}	V_{GS}=-3V, I_{SD}=9A		4.3		V
Reverse Recovery Time	t_{rr}	V_{GS}=-3/+18V, I_{SD}=9A, V_R=800V, dI_F/dt=400A/μs		77.5		ns
Reverse Recovery Charge	Q_{rr}			205		nC
Peak Reverse Recovery Current	I_{rrm}			5.3		A
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=1000V,V_{GS}=0V,f=1MHz V_{AC}=25mV		780		pF
Output Capacitance	C_{oss}			42		
Reverse Transfer Capacitance	C_{rss}			6.2		
Coss Stored Energy	E_{oss}			23.6		μJ
Total Gate Charge	Q_g	V_{DS}=800V,V_{GS}=-3/+18V I_D=9A		47		nC
Gate-Source Charge	Q_{gs}			8.7		
Gate-Drain Charge	Q_{gd}			25		
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=800V, V_{GS}=-3/+18V, $R_{G(ext)}$=2.5Ω, I_{DS}=9A, L=600μH		8		ns
Turn-On Rise Time	t_r			13		
Turn-Off Delay Time	$t_{d(off)}$			17		
Turn-Off Fall Time	t_f			16		
Turn-On switching energy	E_{on}			114		μJ
Turn-Off switching energy	E_{off}			7		

Curve Characteristics

Fig. 1 - Typical Output Characteristic(T_J=25°C)

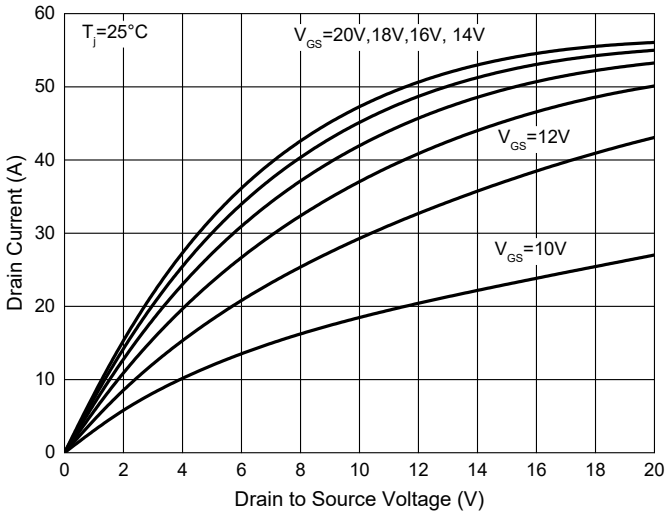


Fig. 2 - Typical Output Characteristic (T_J=175°C)

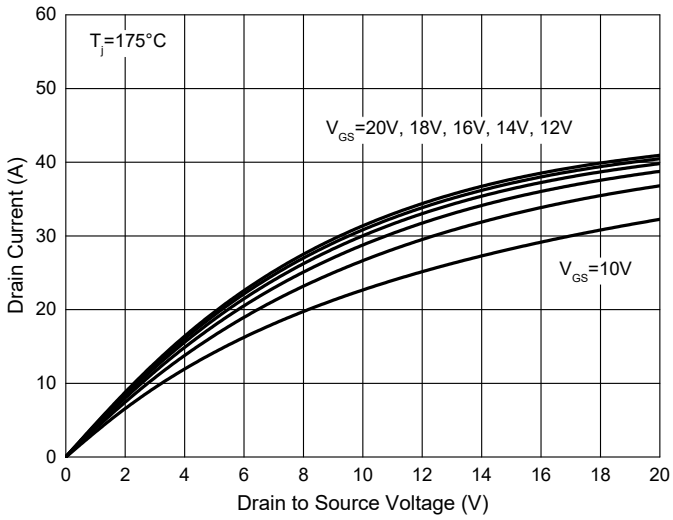


Fig. 3 - Typical Transfer Characteristic

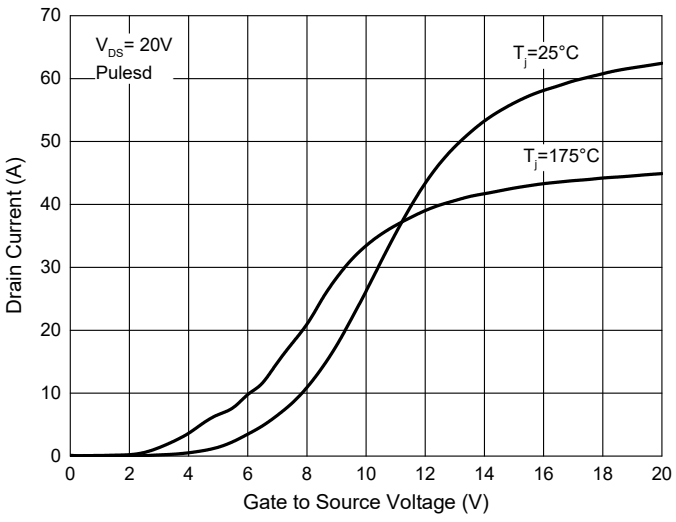


Fig. 4 - On-Resistance vs. Drain Current

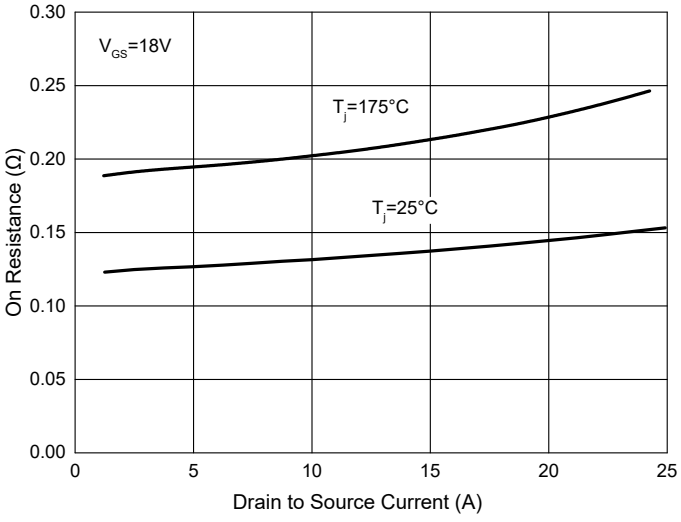


Fig. 5 On-Resistance vs Gate Voltage

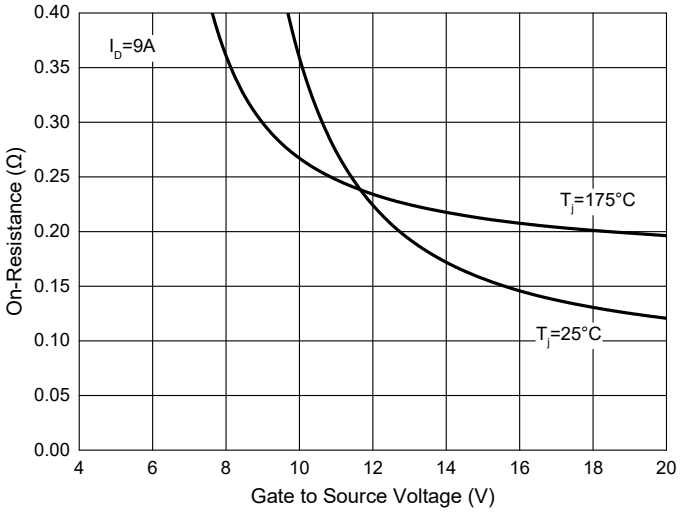
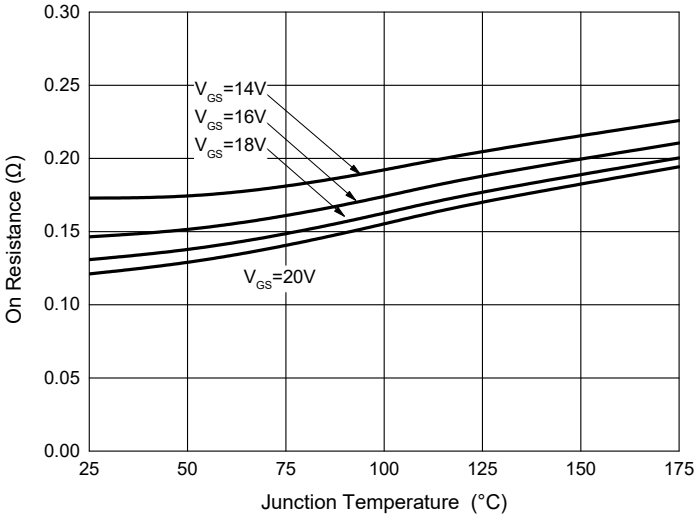


Fig. 6 - On-Resistance vs Temperature



Curve Characteristics

Fig. 7 - Normalized On-Resistance vs Temperature

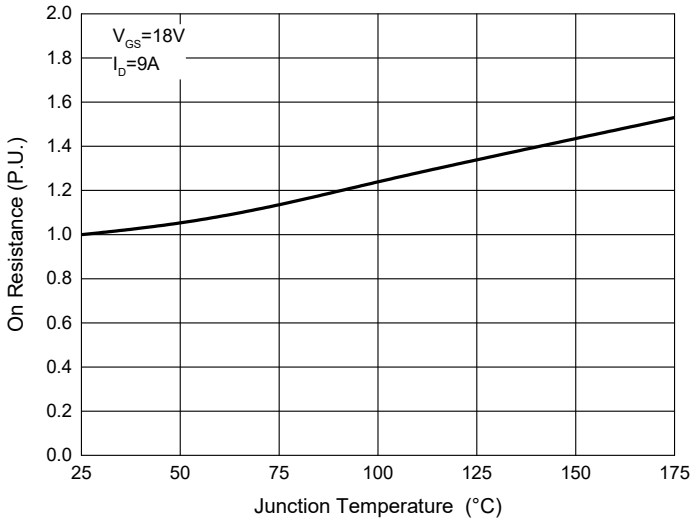


Fig. 8 - Body Diode Characteristic

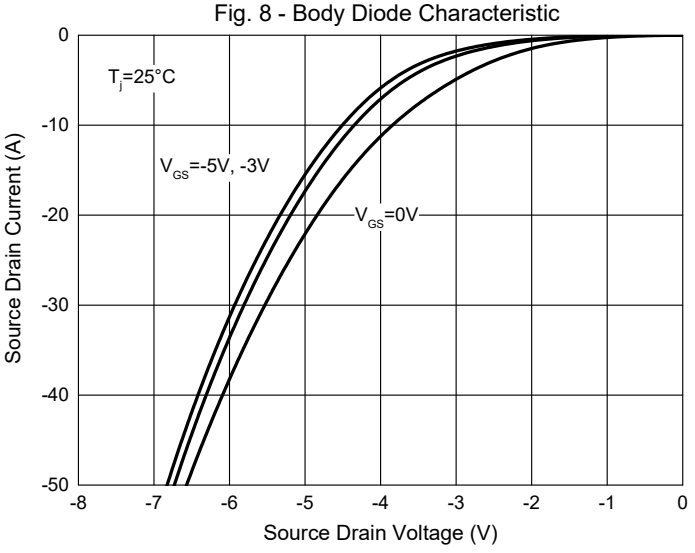


Fig. 9 - Body Diode Characteristic

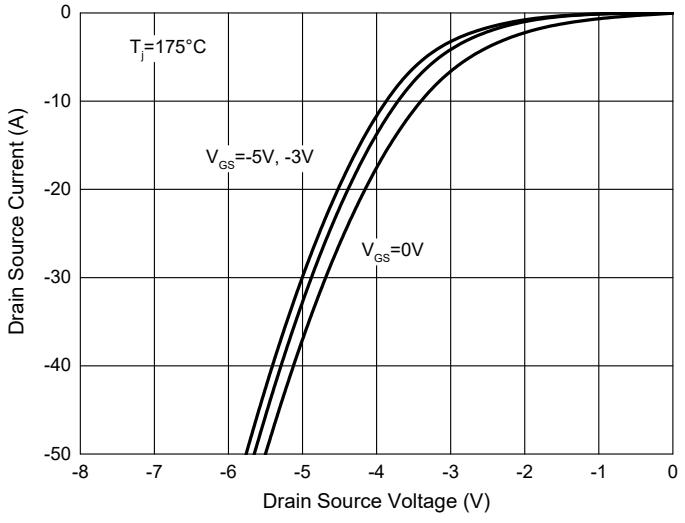


Fig. 10 - Output capacitor stored energy

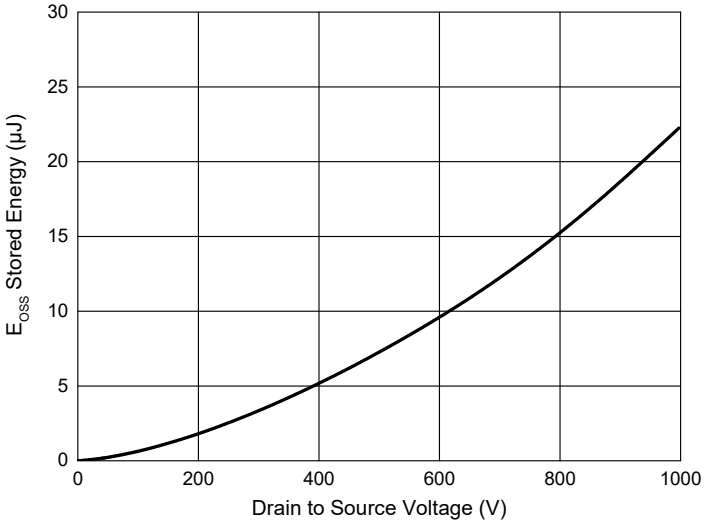


Fig. 11 - Threshold Voltage vs Temperature

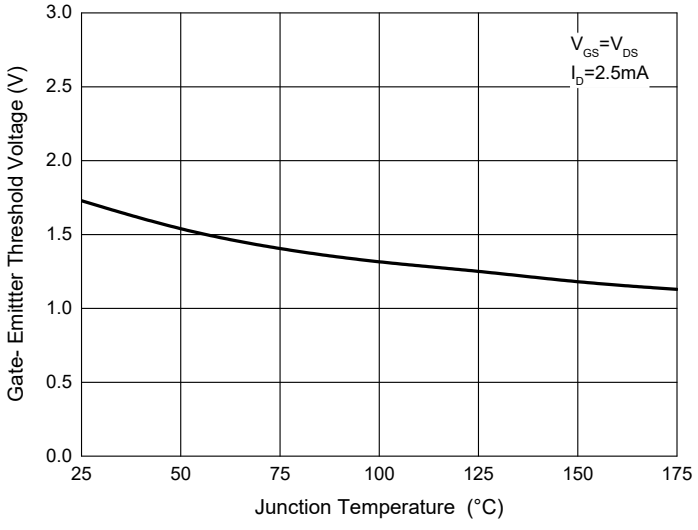
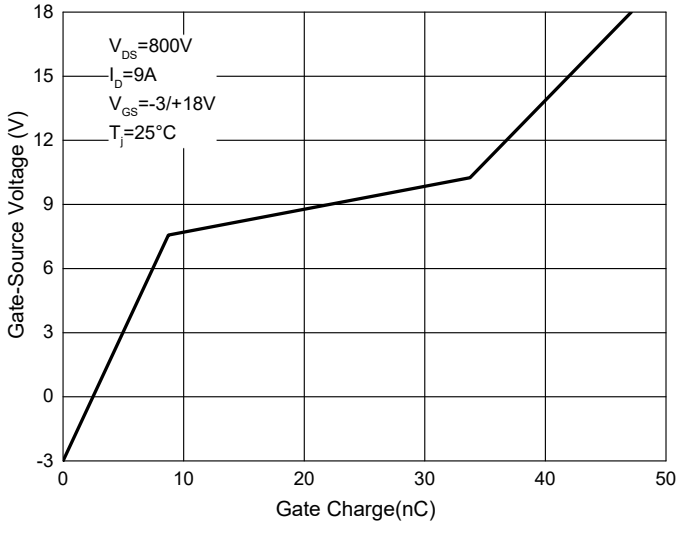


Fig. 12 - Typical Gate Charge



Curve Characteristics

Fig. 13 - Capacitance Characteristics

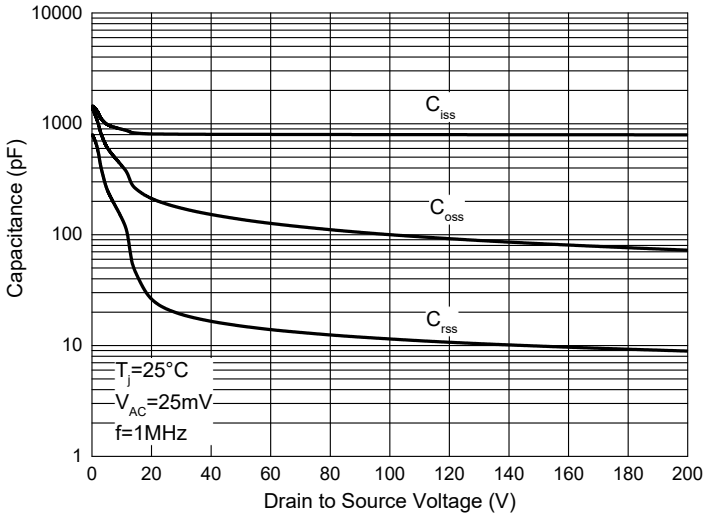


Fig. 14 - Capacitance Characteristics

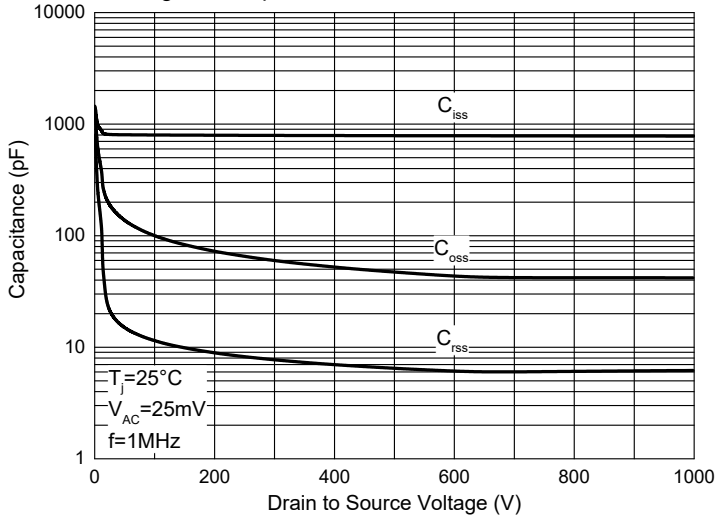


Fig. 15 - Drain Current Derating vs Case Temperature

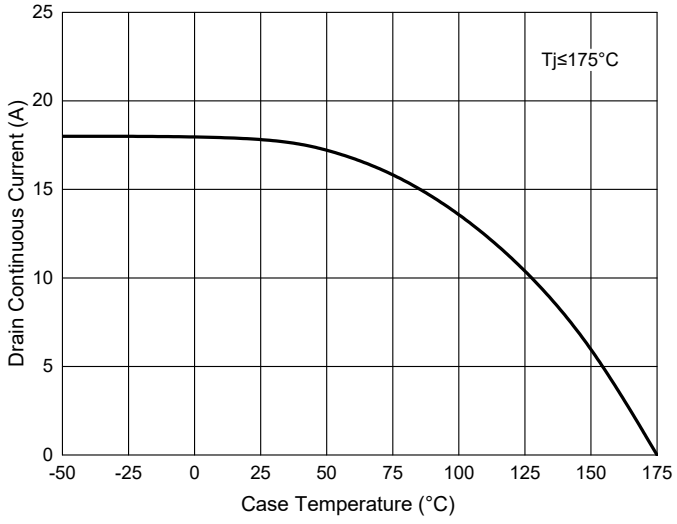


Fig. 16 - Junction to Case Transient Thermal Impedance

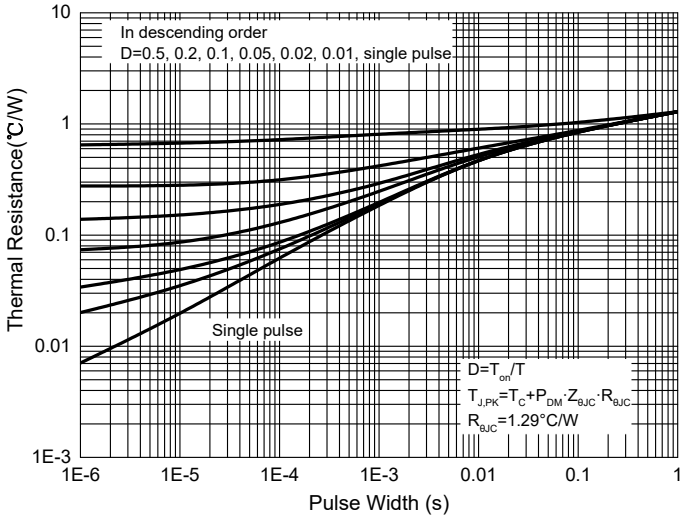


Fig. 17 - Safe Operation Area

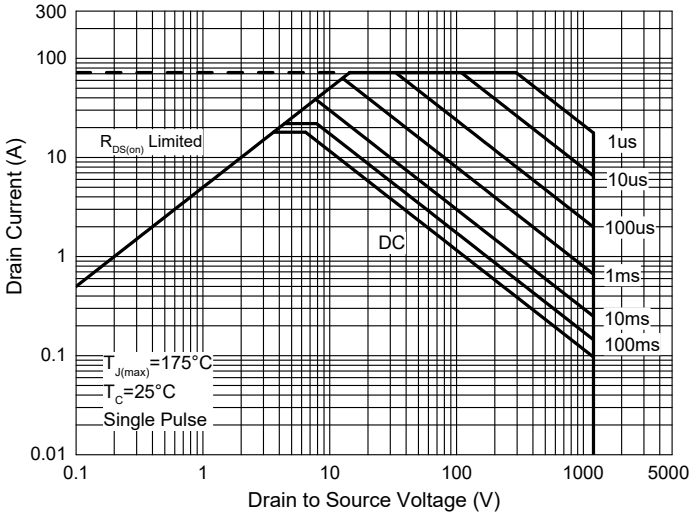
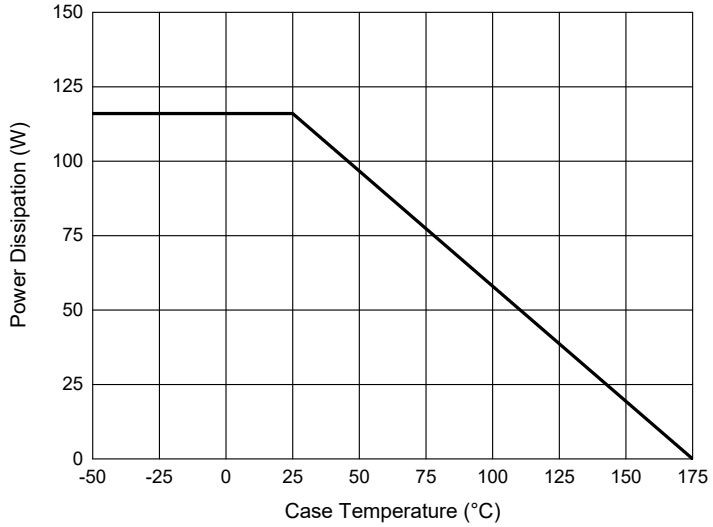


Fig. 18 - Power Derating



Ordering Information

Device	Packing
SICBG160N120A-TP	800pcs/Reel