

## SiC Mosfet

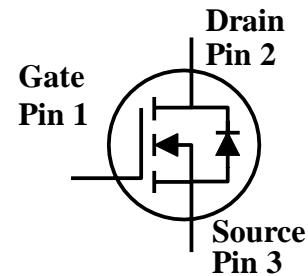
### Features:

- High Voltage, Low On-State Resistance
- High Speed, Low Parasitic Capacitance
- High Operating Junction Temperature
- Fast Recovery Body Diode

### Applications:

- Photovoltaic Inverter
- UPS Power Supply
- Motor Drive
- High-Voltage DC/DC Converters
- Switching Power Supply

### Package:



Product Code	Package
SL19N120A	TO-247-3

### Maximum Ratings (T<sub>c</sub>=25°C, unless otherwise specified)

Symbol	Parameter description	Typical value	Unit	Testing conditions	Note
V <sub>DS</sub>	Drain-Source Voltage	1200	V	V <sub>GS</sub> =0V, I <sub>D</sub> =100μA	
V <sub>GS</sub>	Gate-Source Voltage	-5 to 20	V	The device is recommended working within the voltage range listed above.	
I <sub>D</sub>	Maximum Drain-Source Current	19	A	V <sub>GS</sub> =20V, T <sub>c</sub> =25°C	Figure 21
		14	A	V <sub>GS</sub> =20V, T <sub>c</sub> =100°C	
I <sub>DM</sub>	Maximum Pulse Drain-Source Current	48	A	It depends on the safe operating area (SOA) of the device.	Figure 24
P <sub>TOT</sub>	Maximum Power Dissipation	134	W	T <sub>c</sub> =25°C	Figure 22
T <sub>stg</sub>	Storage Temperature Range	-55 to 175	°C		
T <sub>j</sub>	Operating Junction Temperature Range	-55 to 175	°C		
T <sub>L</sub>	Soldering Temperature	260	°C	Wave Soldering is done on the lead, 1.6mm away from the package housing, and it lasts for no more than 10 seconds	

### Thermal-Resistance Property

Symbol	Parameter description	Typical value	Unit	Note
R <sub>θ(j-c)</sub>	junction-to-case thermal resistance	1.122	°C/W	Figure 23

## Electrical Property (TC = 25°C, unless otherwise specified)

Symbol	Parameter description	Code Value			Unit	Testing conditions	Note
		MIN	Typical	MAX			
I <sub>DSS</sub>	Drain Leakage At Shutdown		5	100	μA	V <sub>DS</sub> =1200V, V <sub>GS</sub> =0V	
I <sub>GSS</sub>	Gate Induced Drain Leakage		1	±100	nA	V <sub>DS</sub> =0V, V <sub>GS</sub> =-5~20V	
V <sub>TH</sub>	Threshold Voltage		2.9		V	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =1.9mA	Figure 8, 9
			1.9			V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =1.9mA @ T <sub>C</sub> =175°C	
R <sub>ON</sub>	On-State Resistance		160	195	mΩ	V <sub>GS</sub> =20V, I <sub>D</sub> =10A @ T <sub>J</sub> =25°C	Figure 4, 5, 6, 7
			285		mΩ	V <sub>GS</sub> =20V, I <sub>D</sub> =10A @ T <sub>J</sub> =175°C	
C <sub>iss</sub>	Input Capacitance		895		pF	V <sub>DS</sub> =800V, V <sub>GS</sub> =0V, f=1MHz, V <sub>AC</sub> =25mV	Figure 16
C <sub>oss</sub>	Output Capacitance		43		pF		
C <sub>rss</sub>	Reverse Transfer Capacitance		2		pF		Figure 17
E <sub>oss</sub>	Output Capacitance Storage Energy		4.2		μJ		
Q <sub>g</sub>	Total Gate Charge		43		nC	V <sub>DS</sub> =800V, I <sub>D</sub> =10A, V <sub>GS</sub> =-5 to 20V	Figure 18
Q <sub>gs</sub>	Gate-Source Charge		9		nC		
Q <sub>gd</sub>	Gate-Drain Charge		19		nC		
R <sub>g</sub>	Gate Input Resistance		8.5		Ω	f=1MHz	
E <sub>ON</sub>	Turn-on Energy		204		μJ	V <sub>DS</sub> =800V, I <sub>D</sub> =10A, V <sub>GS</sub> =-2 to 20V, R <sub>G(ext)</sub> =3.3Ω, L=450μH	Figure 19, 20
E <sub>OFF</sub>	Turn-off Energy		34.4		μJ		
t <sub>d(on)</sub>	Turn-on Delay Time		15.2		ns		
t <sub>r</sub>	Rise Time		14.4				
t <sub>d(off)</sub>	Turn-off Delay Time		11.3				
t <sub>f</sub>	Fall Time		13.1				

## Electrical Property (T<sub>c</sub>=25°C, unless otherwise specified)

Symbol	Parameter description	Code Value			Unit	Testing conditions	Note
		MIN	Typical	MAX			
V <sub>SD</sub>	Forward Voltage		4.1		V	I <sub>SD</sub> =5A, V <sub>GS</sub> =0V	Figure 10, 11, 12
			3.7		v	I <sub>SD</sub> =5A, V <sub>GS</sub> =0V, T <sub>J</sub> =175°C	
t <sub>rr</sub>	Reverse Recovery Time		33.2		ns	V <sub>GS</sub> =-2V/+20V, I <sub>SD</sub> =10A, V <sub>R</sub> =800V, di/dt=1000A/us, R <sub>G(ext)</sub> =13Ω	
Q <sub>rr</sub>	Reverse Recovery Charge		101.5		nC		
I <sub>RRM</sub>	Peak Repetitive Reverse Current		5.6		A		

## Typical Characteristic Curves:

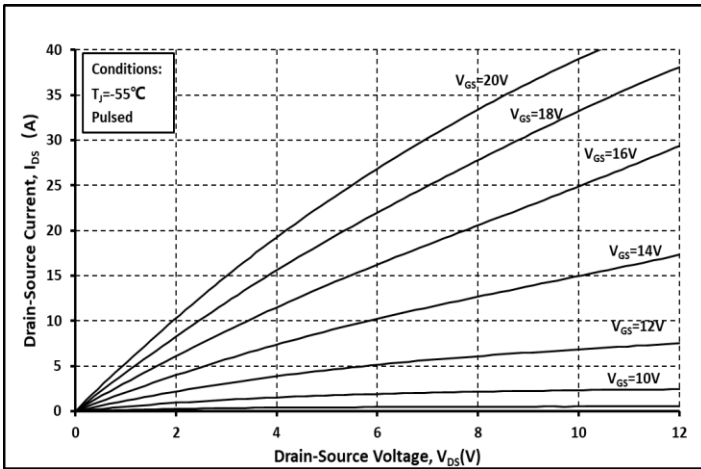


Figure. 1 Output @  $T_j = -55^\circ\text{C}$

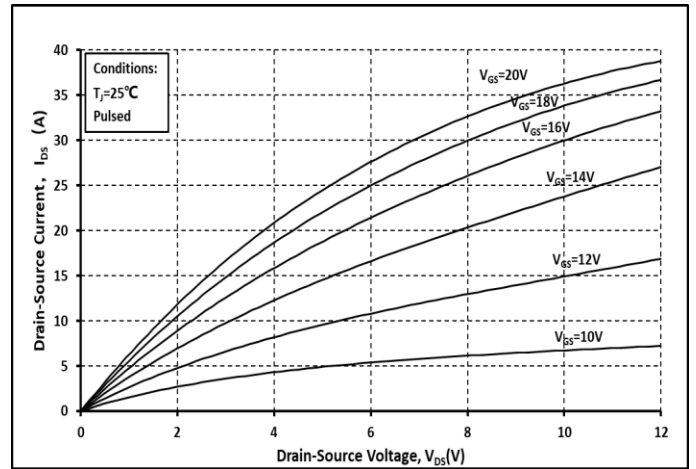


Figure. 2 Output @  $T_j = 25^\circ\text{C}$

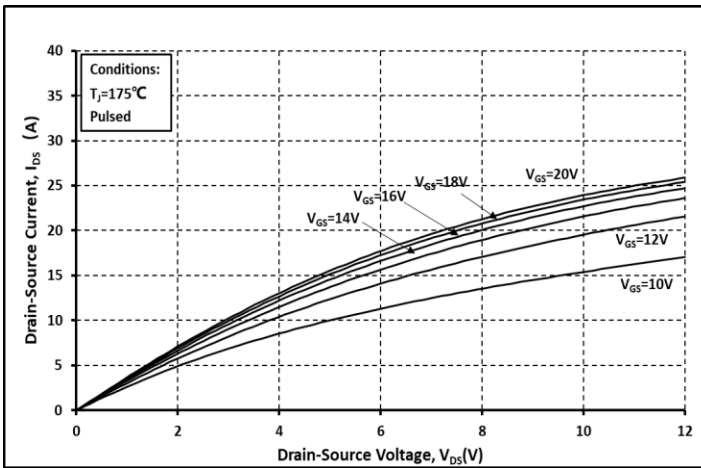


Figure. 3 Output @  $T_j = 175^\circ\text{C}$

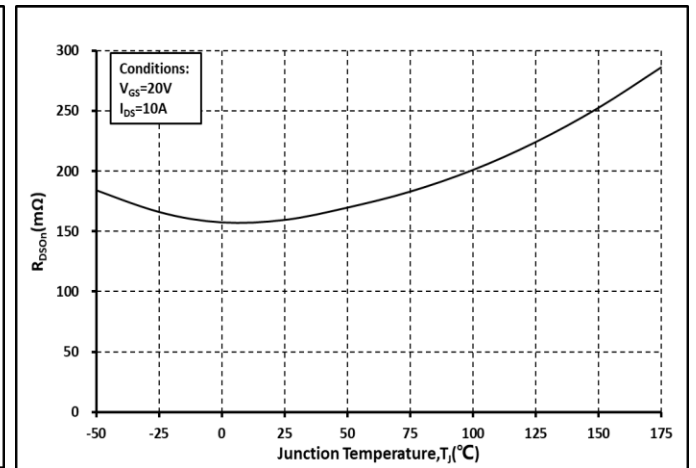


Figure. 4  $R_{on}$  VS Temperature

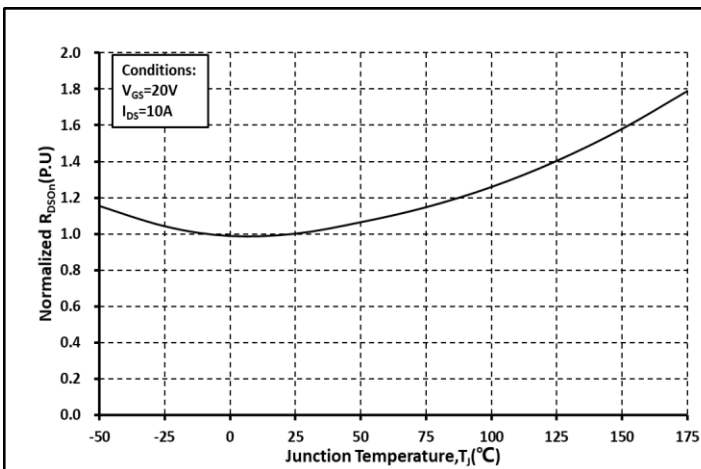


Figure. 5 Normalized  $R_{on}$  VS Temperature

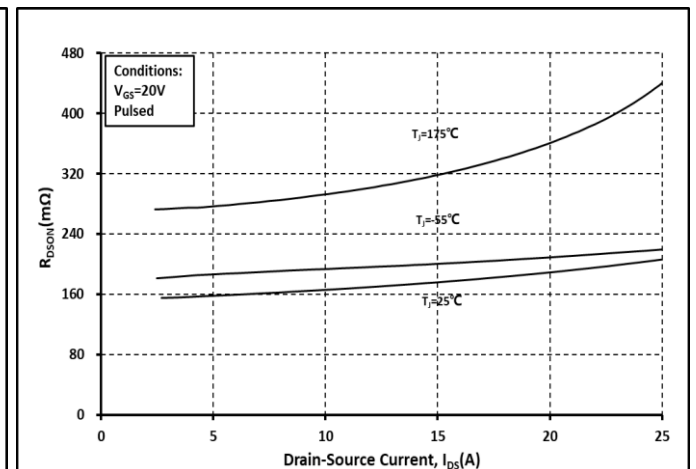


Figure. 6  $R_{on}$  VS  $I_{DS}$  at Different Temperatures

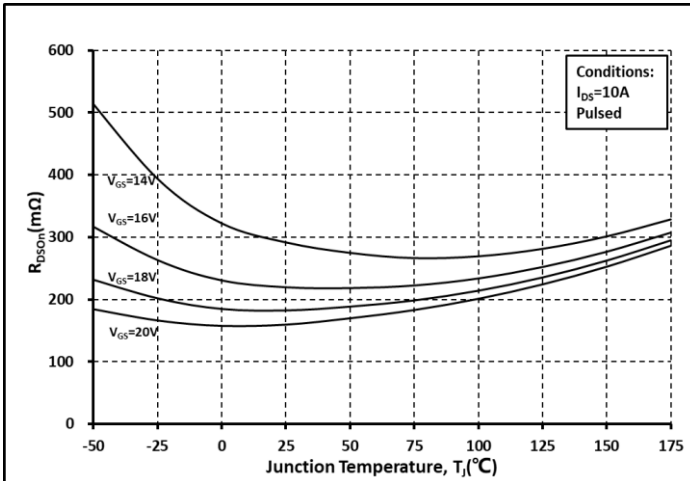


Figure. 7 Ron VS Temperature at Different VGS

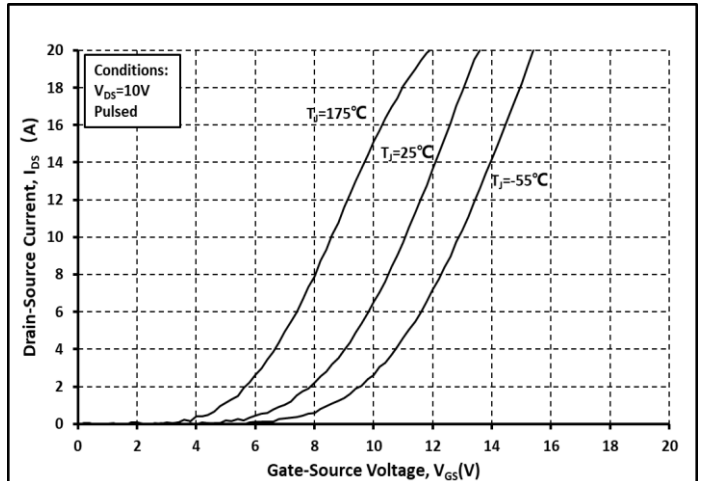


Figure. 8 Transfer Property at Different Temperatures

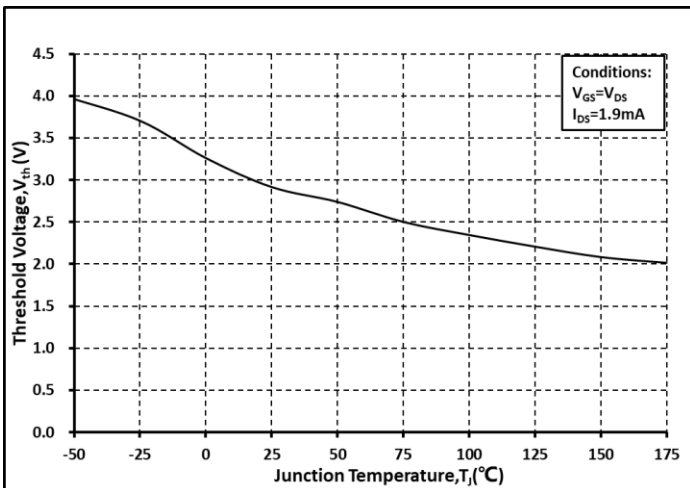


Figure. 9 Threshold Voltage Change With Temperature

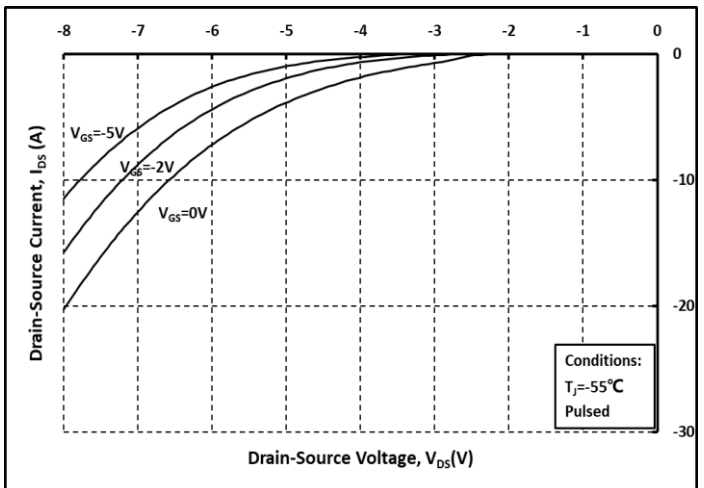


Figure. 10 Body Diode On-State @ TJ = -55°C

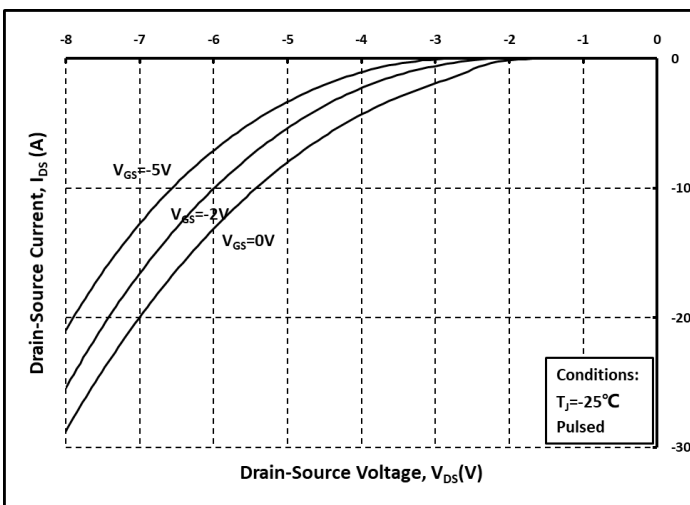


Figure. 11 Body Diode On-State @ TJ=25°C

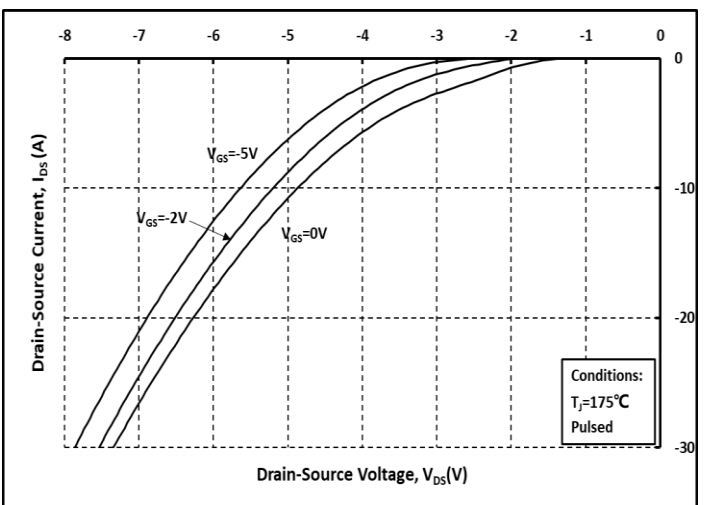


Figure. 12 Body Diode On-State @ TJ=175°C

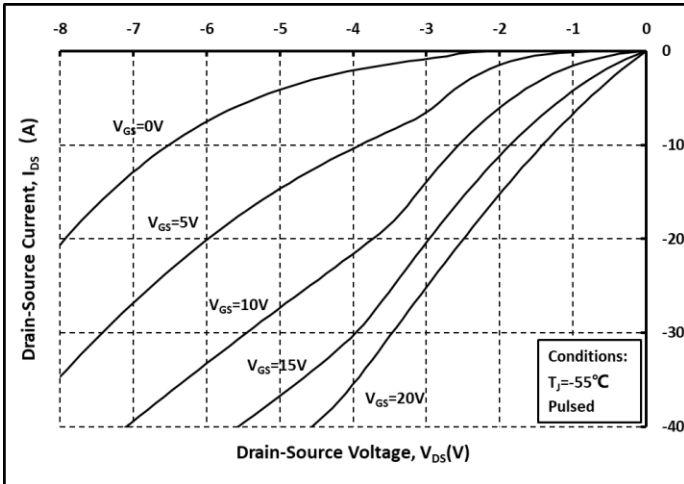


Figure. 13 Quadrant III @  $T_j = -55^\circ\text{C}$

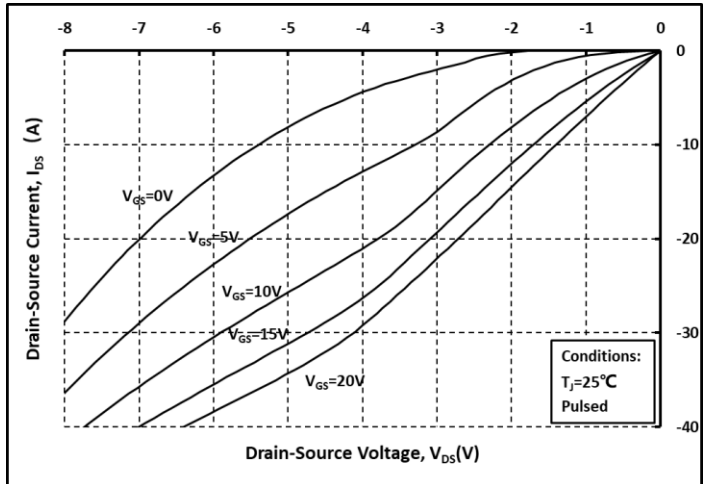


Figure. 14 Quadrant III @  $T_j = 25^\circ\text{C}$

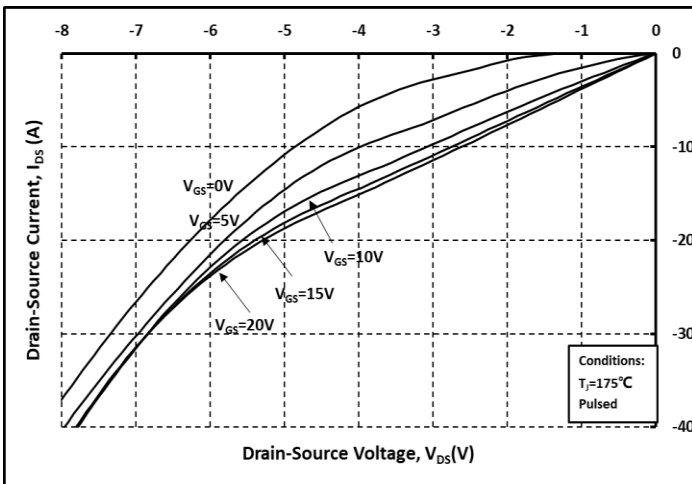


Figure. 15 Quadrant III @  $T_j = 175^\circ\text{C}$

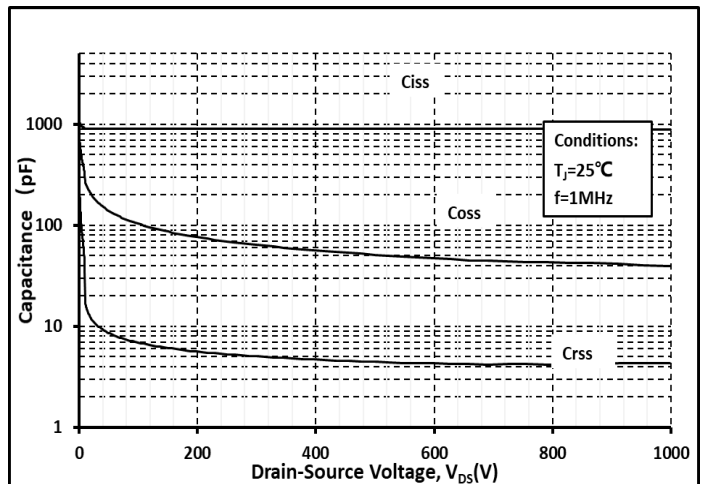


Figure. 16 Capacitances VS  $V_{DS}$

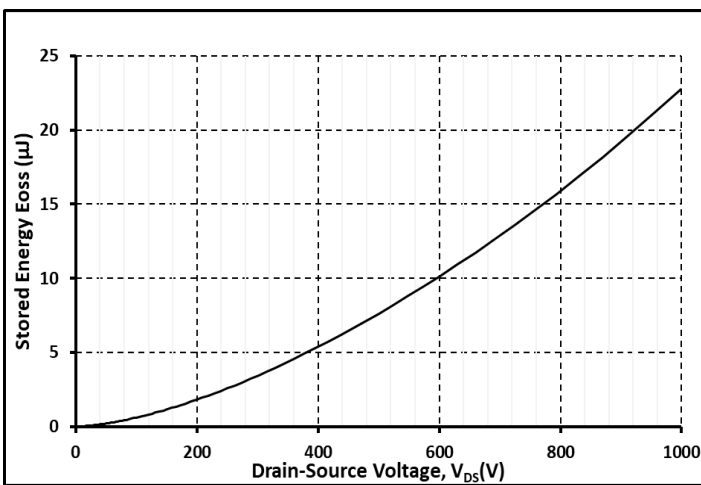


Figure. 17 Output Capacitance Storage

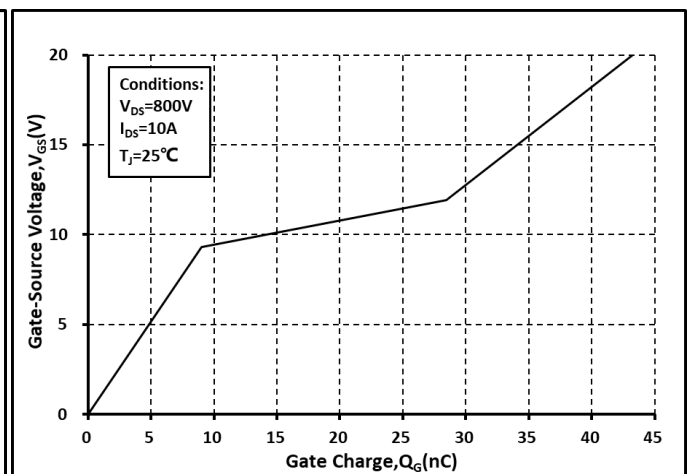


Figure. 18 Gate charge characteristic curve

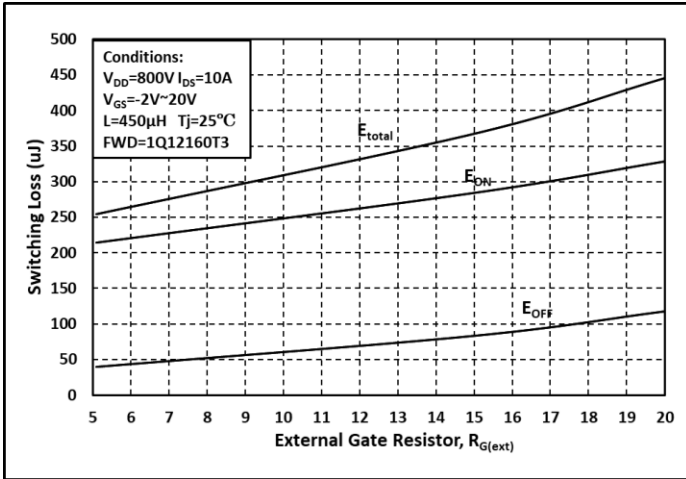


Figure. 19 Switching Energy VS Gate Resistance  $R_{G(est)}$

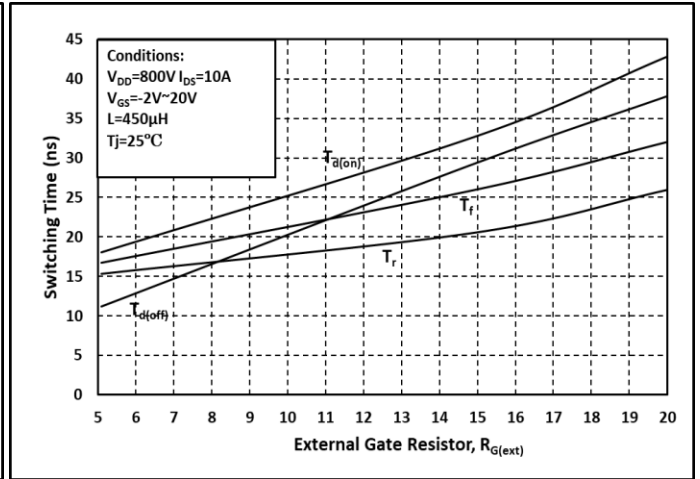


Figure. 20 Switching Time VS Gate Resistance  $R_{G(est)}$

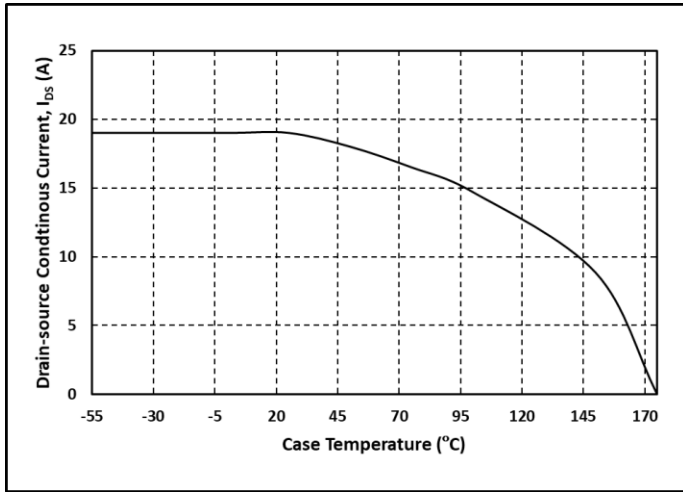


Figure. 21 Drain Current VS Temperature

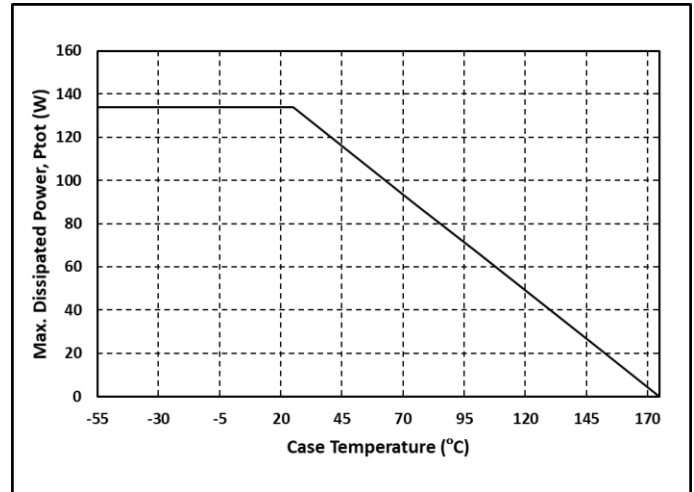


Figure. 22 Maximum Power Derating VS Temperature

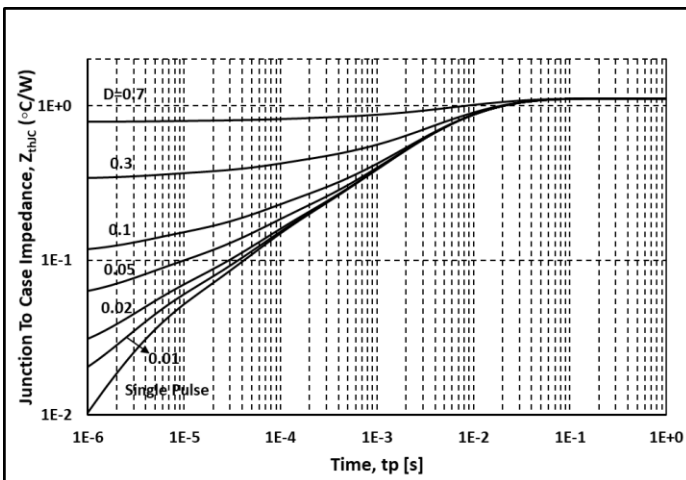


Figure. 23 Thermal Resistance

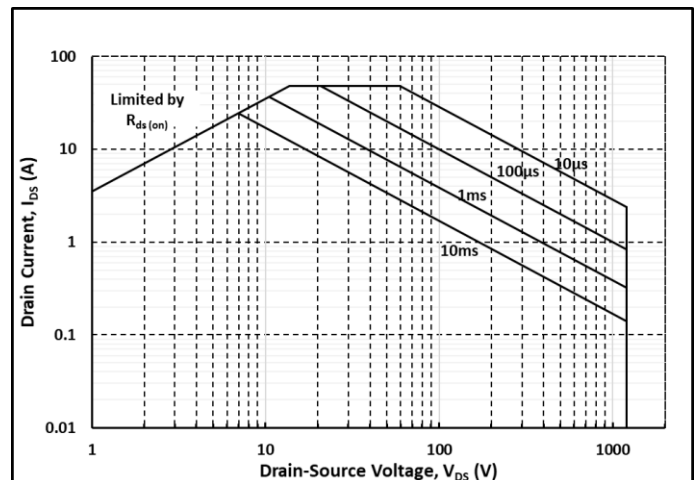
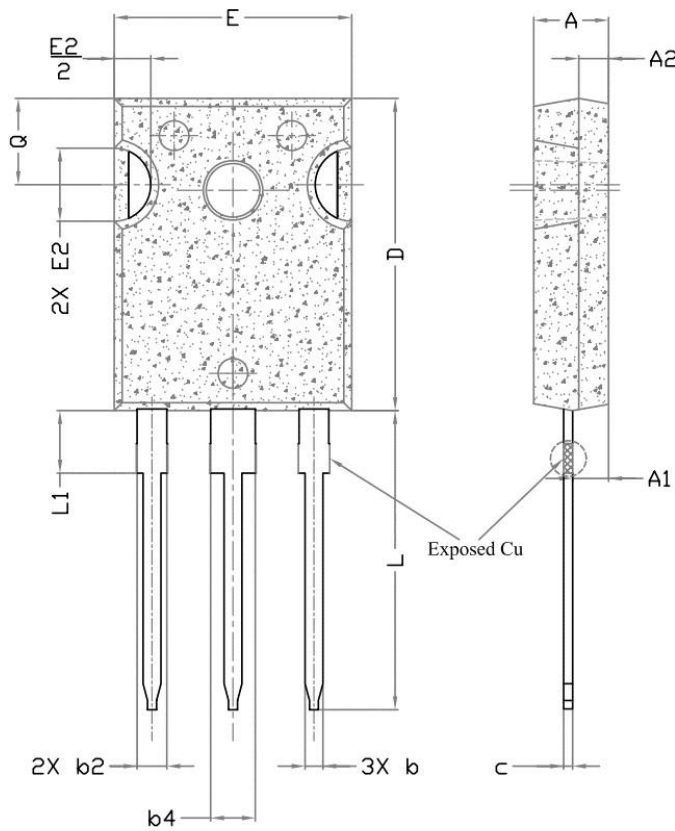
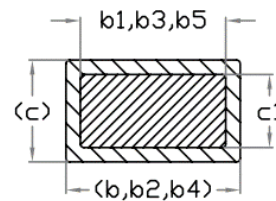
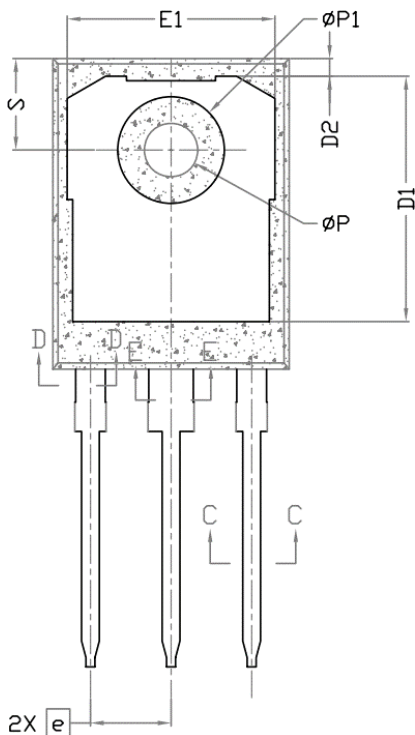


Figure. 24 The Safe Operating Area

## Package Specification



SYMBOL	DIMENSIONS			NOTES
	MIN.	NOM.	MAX.	
A	4.83	5.02	5.21	
A1	2.29	2.41	2.55	
A2	1.50	2.00	2.49	
b	1.12	1.20	1.33	
b1	1.12	1.20	1.28	
b2	1.91	2.00	2.39	6
b3	1.91	2.00	2.34	
b4	2.87	3.00	3.22	6, 8
b5	2.87	3.00	3.18	
c	0.55	0.60	0.69	6
c1	0.55	0.60	0.65	
D	20.80	20.95	21.10	4
D1	16.25	16.55	17.65	5
D2	0.51	1.19	1.35	
E	15.75	15.94	16.13	4
E1	13.46	14.02	14.16	5
E2	4.32	4.91	5.49	3
e	5.44BSC			
L	19.81	20.07	20.32	
L1	4.10	4.19	4.40	6
∅P	3.56	3.61	3.65	7
∅P1	7.19REF.			
Q	5.39	5.79	6.20	
S	6.04	6.17	6.30	



Section C--C, D--D, E--E

### Description:

1. Standard Reference: JEDEC TO247, Variation AD
2. Unit: mm
3. There shall be slots in it, and the shape can be round.
4. Mould overflowing is excluded from D and E.