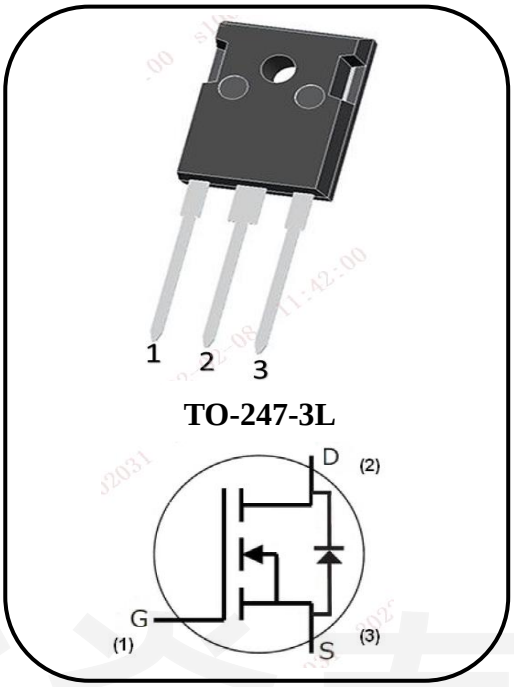
Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness



Benefits

- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

Applications

- Solar Inverters
- High Voltage DC/DC Converters
- Motor Drives
- Switch Mode Power Supplies

Device	Package	Marking
ASMC120T080G1	**TO-247-3L**	ASMC120T080G1

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	Test Conditions
Drain - Source Voltage	V_{DSmax}	1200	V	V_{GS}=0V, ID =100μA,T_C=25℃
Gate - Source Voltage	V_{GSmax}	-10/+25		Absolute maximum values, T_C=25℃
Gate - Source Voltage	V_{GSop}	-5/+20		Recommended, T_C=25℃
Continuous Drain Current	I_D	34	A	V_{GS}=20V, T_C=25℃
		24		V_{GS}=20V, T_C=100℃
Pulse Drain Current	$I_{D(pulse)}$	86	A	T_C=25℃, tp=10ms,half Sine Wave D=0.1
Total power dissipation	P_{tot}	194	W	T_C=25℃
Operating temperature and storage temperature	T_J , T_{stg}	-55~175	℃	
Solder Temperature	T_L	260	℃	1.6mm from case for 10s
Mounting Torque	M	1	Nm	M3 Screw

Electrical Characteristics T_j =25℃

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	1200			V	V_{GS}=0V,I_D=100μA
Gate Threshold Voltage	$V_{GS(th)}$	2	2.6	4		V_{DS}=V_{GS},I_D=5mA
			1.7			V_{DS}=V_{GS},I_D=5mA, T_j =175ºC
Zero Gate Voltage Drain Current	I_{DSS}		1	100	μA	V_{DS}=1200V, V_{GS}=0V
Gate-Source Leakage Current	I_{GSS}		1	250	nA	V_{GS}=20V, V_{DS}=0V
Drain-Source On-State Resistance	$R_{DS(on)}$		80	98	mΩ	V_{GS}=20V, I_D=20A
			150			V_{GS}=20V, I_D=20A, T_j =175ºC
Transconductance	g_{fs}		10		S	V_{DS}=20V, I_D=20A
			9			V_{DS}=20V, I_D=20A, T_j =175ºC
Input Capacitance	C_{iss}		937		pF	V_{GS}=0V V_{DS}=1000V f =1MHz V_{AC}=25mV
Output Capacitance	C_{oss}		65			
Reverse Transfer Capacitance	C_{rss}		8			
C_{OSS} Stored Energy	E_{oss}		37		μJ	
Avalanche Energy	E_{AS}		810		mJ	I_D=20A, V_{DD}=50V
Turn-On Switching Energy	E_{ON}		855		μJ	V_{DD}=800V, V_{GS}=-5/20V, I_D=20A, $R_{G(ext)}$=2.5Ω,L=100μH
Turn-Off Switching Energy	E_{OFF}		112			
Turn-On Delay Time	$t_{d(on)}$		8		nS	V_{DD}=800V, V_{GS}=-5/20V, I_D=20A, $R_{G(ext)}$=2.5Ω, L=100μH
Rise Time	t_r		11			
Turn-Off Delay Time	$t_{d(off)}$		26			
Fall Time	t_f		48			
Internal Gate Resistance	$R_{g(int)}$		3.9		Ω	f =1MHz, V_{AC}=25mV
Gate to Source Charge	Q_{gs}		23		nC	V_{DD}=800V, V_{GS}=-5/20V, I_D=20A, I_{GS}=5mA
Gate to Drain Charge	Q_{gd}		41			
Total Gate Charge	Q_g		86			

Reverse Diode Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage	V_{SD}	3.8		V	V_{GS}=-5V, I_{SD}=10A
		3.5			V_{GS}=-5V, I_{SD}=10A, T_j =175°C
Continuous Diode Forward Current	I_S		34	A	T_c =25˚C
Reverse Recover time	t_{rr}	45		nS	V_{GS}=-5V, I_{SD}=20A, V_R=800V dif/dt =1620A/μs
Reverse Recovery Charge	Q_{rr}	530		nC	
Peak Reverse Recovery Current	I_{rrm}	17		A	

When using SiC Body Diode the maximum recommended V_{GS}=-5V

Thermal Characteristics

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Thermal resistance	$R_{th(j-c)}$	/	0.7	/	℃/W	

ESD Ratings

ESD Test	Total Devices Sampled	Resulting Classification
ESD-HBM	All Devices Passed 1000V	2 (>2000V)
ESD-MM	All Devices Passed 400V	C (>400V)

Typical Electrical Characteristics Curves

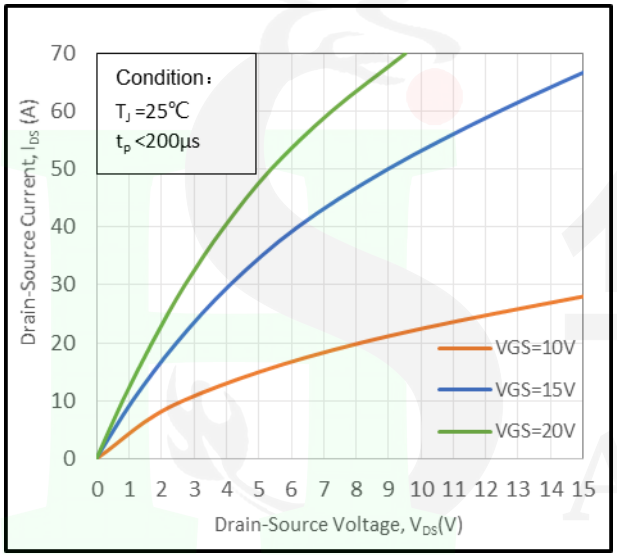


Figure 1. Output Characteristics T_J = 25 ℃

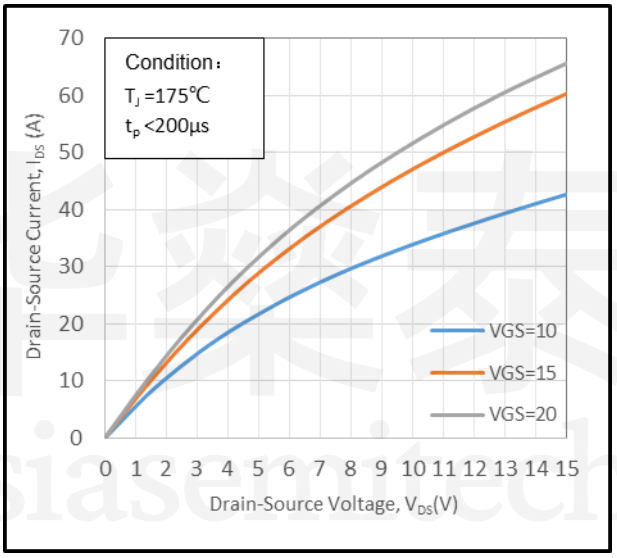


Figure 2. Output Characteristics T_J = 175 ℃

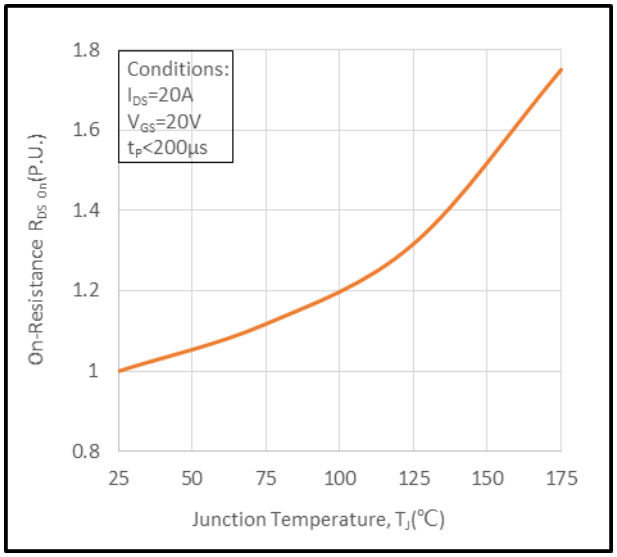


Figure 3. Normalized On-Resistance vs. Temperature

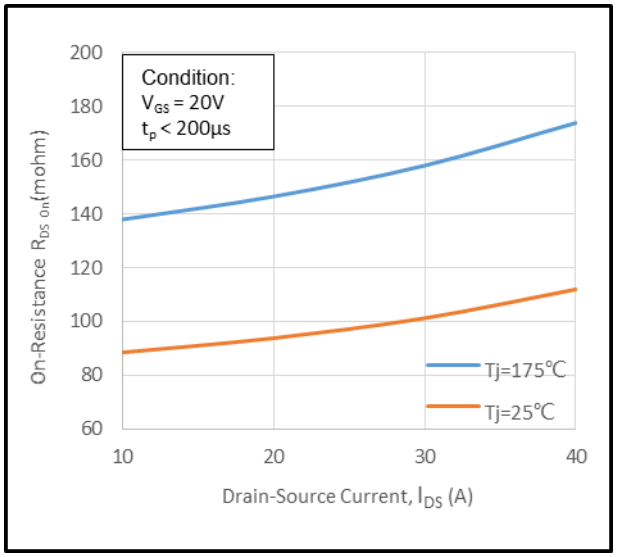


Figure 4. On-Resistance vs. Drain Current For Various Temperatures

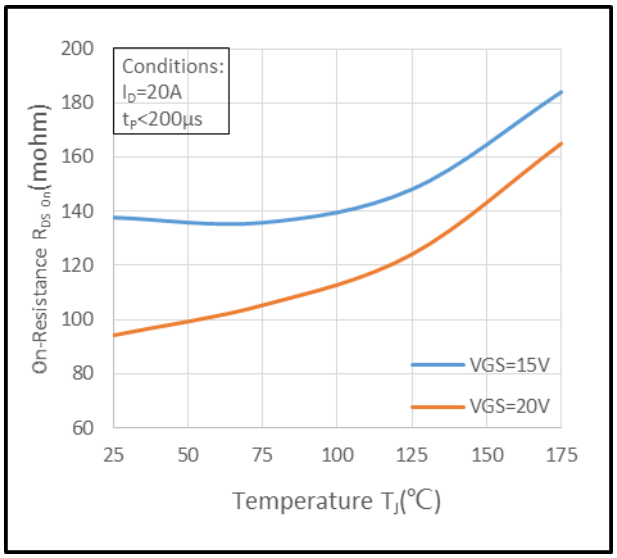


Figure 5. On-Resistance vs. Temperature For Various Gate Voltage

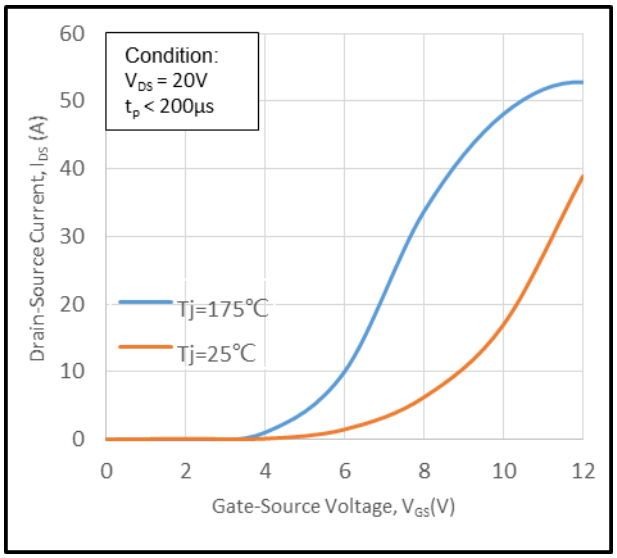


Figure 6. Transfer Characteristic for Various Junction Temperatures

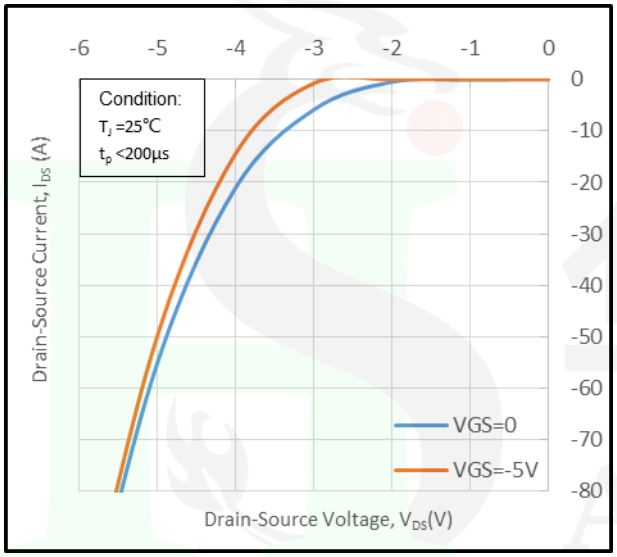


Figure 7. Body Diode Characteristic at 25 ℃

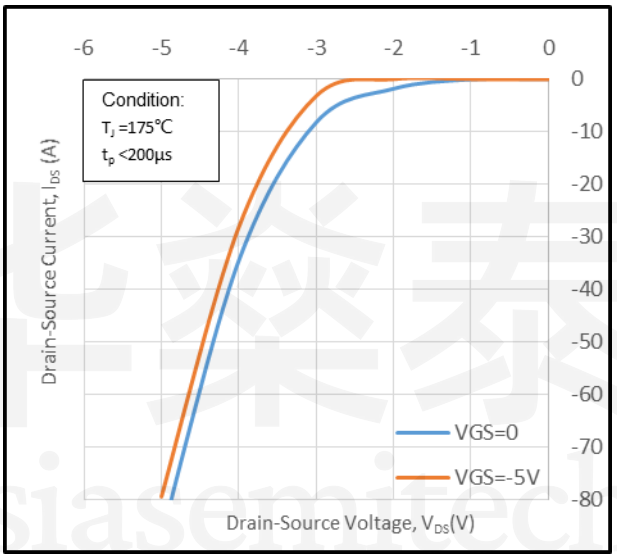


Figure 8. Body Diode Characteristic at 175 ℃

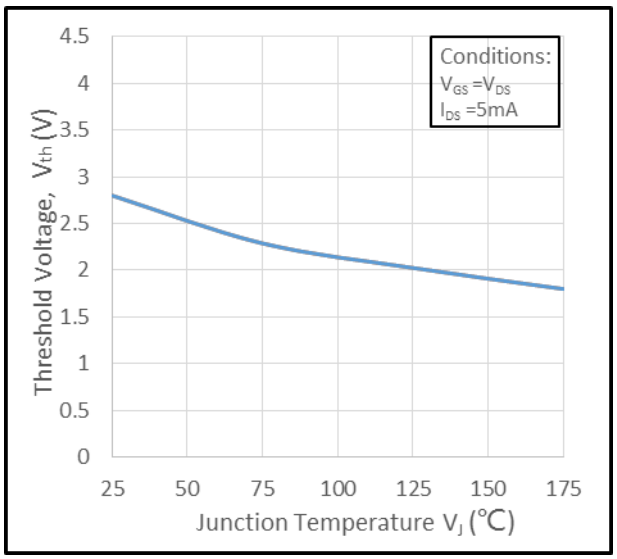


Figure 11. Threshold Voltage vs. Temperature

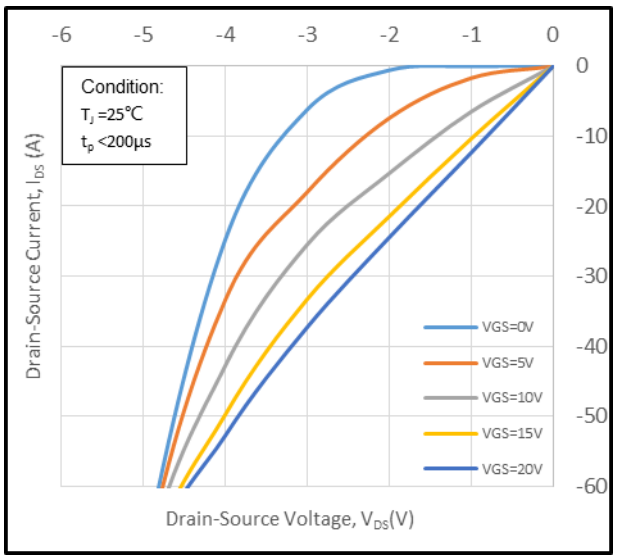


Figure 12. 3rd Quadrant Characteristic at 25 ℃

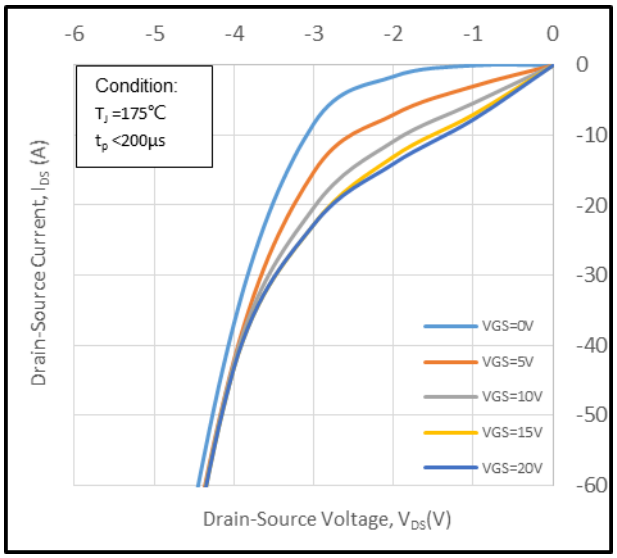


Figure 13. 3rd Quadrant Characteristic at 175℃

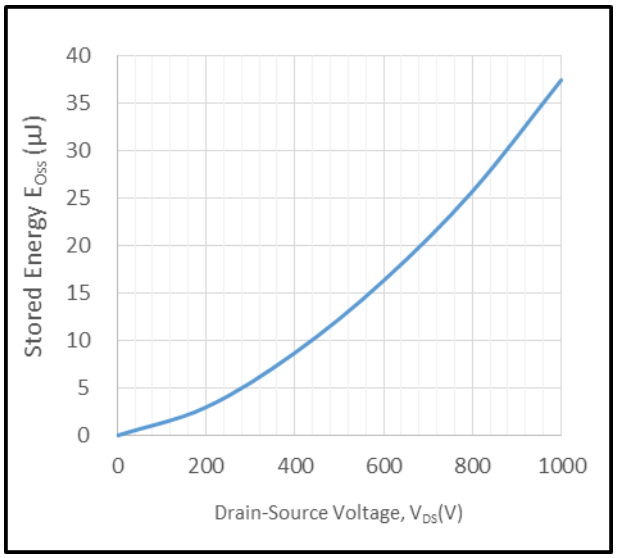


Figure 14. Output Capacitor Stored Energy

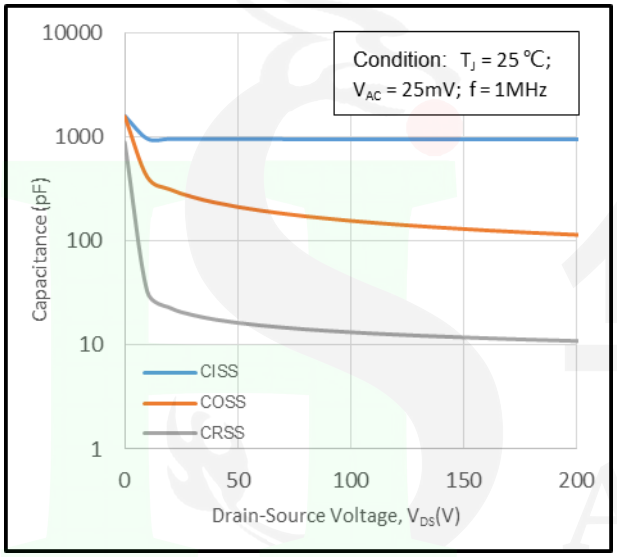


Figure 15. Capacitances vs. Drain-Source Voltage (0 - 200V)

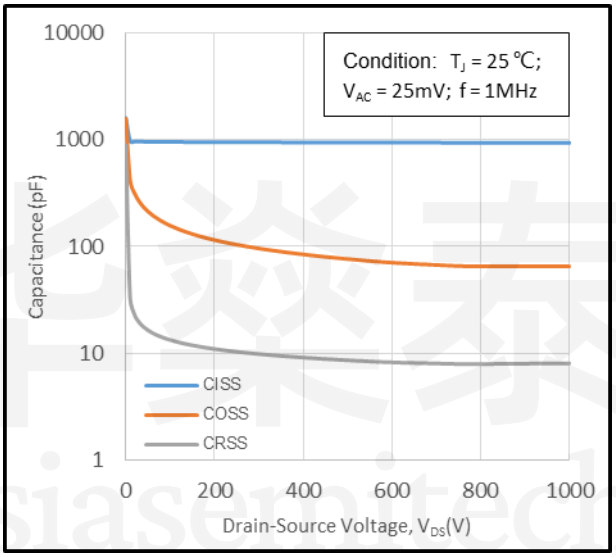


Figure 16. Capacitances vs. Drain-Source Voltage (0 - 1000V)

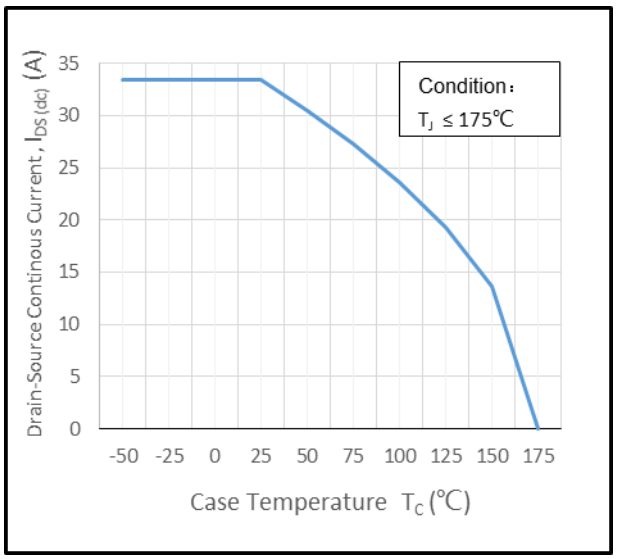


Figure 17. Continuous Drain Current Derating vs. Case Temperature

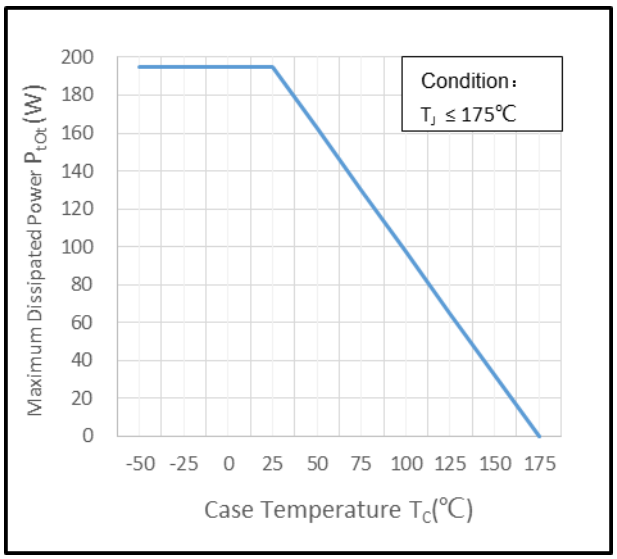
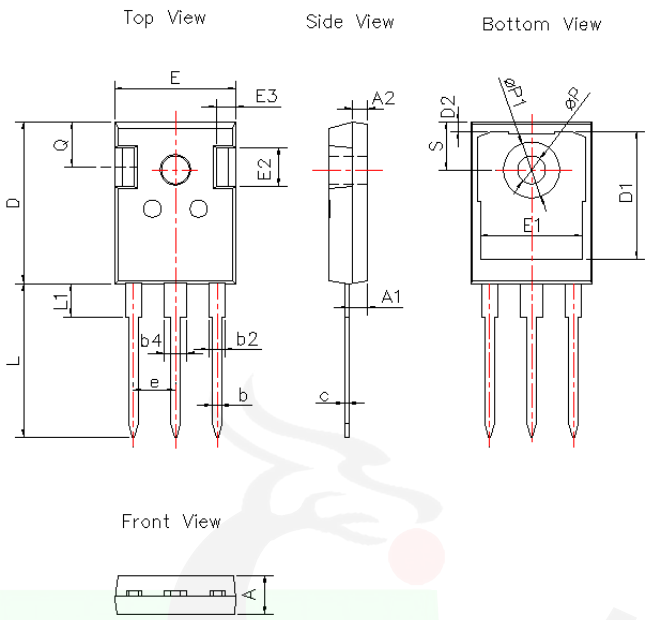


Figure 18. Maximum Power Dissipation Derating vs. Case Temperature

Package



Dimension unit:[mm]			
SYMBOL	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.60	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
D2	1.00	1.20	1.35
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44 BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
øP	3.40	3.60	3.80
øP1	-	-	7.30
Q	5.40	5.80	6.20
S	6.20 BSC		

Ordering information

Part Number	ASMC120T080G1
Package	TO-247-3L
Unit Quantity	300 EA
Packing Type	Tube
RoHS	Yes