

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D@25^{\circ}C$
1700V	0.9Ω@18V	7.4A
	0.8Ω@20V	

Feature

- Wide bandgap SiC MOSFET technology
- Low On-Resistance with high blocking voltage
- Low capacitances with High-Speed switching
- Low reverse recovery(Qrr)

Application

- Switch mode power supplies
- Auxiliary power supplies
- High voltage capacitive loads

Package

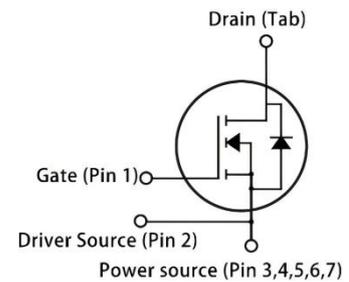


TO-263-7L

Marking



Circuit diagram



Absolute maximum ratings ($T_c=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Test Condition	Value	Unit
Drain-Source Voltage	V_{DSmax}	$V_{GS} = 0V, I_D = 100\mu A$	1700	V
Gate-Source Voltage	V_{GSmax}	AC (f > 1Hz)	-10/+25	V
Gate-Source Voltage	V_{GSOP}	Static	-4/+18	V
Continuous Drain Current	I_D	$V_{GS} = 18V$	7.4	A
	I_D	$V_{GS} = 18V, T_C = 100^{\circ}C$	5	A
Pulsed Drain Current	$I_{D,pulse}$	Pulse with t_p limited by T_{jmax} at 1 ms	8.5	A
		Pulse with t_p limited by T_{jmax} at 100 μs	15	A
Power Dissipation	P_D	$T_J = 175^{\circ}C$	71	W
Thermal Resistance (Typ)	$R_{\theta JC}$	Junction-to-Case	2.12	$^{\circ}C/W$
Junction Temperature	T_J		-55~ +175	$^{\circ}C$
Storage Temperature	T_{STG}		-55~ +175	$^{\circ}C$

Electrical characteristics (T_J=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 100μA	1700			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 1700V, V _{GS} = 0V			50	μA
Gate-Source leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} = 18V			250	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 0.5mA		2.8		V
		V _{DS} = V _{GS} , I _D = 0.5mA, T _J = 175°C		2		
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 18V, I _D = 2A		0.9	1.4	Ω
		V _{GS} = 20V, I _D = 2A		0.8		
		V _{GS} = 20V, I _D = 2A, T _J = 175°C		2		
Transconductance	g _{fs}	V _{GS} = 18V, I _D = 2A		1		S
		V _{GS} = 18V, I _D = 2A, T _J = 175°C		0.8		
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} = 1000V, V _{GS} = 0V V _{AC} = 25mV, f = 1MHz		168		pF
Output Capacitance	C _{oss}			13		
Reverse Transfer Capacitance	C _{rss}			2.7		
Total Gate Charge	Q _g	V _{DS} = 1200V, V _{GS} = -4V/18V I _D = 2A		15		nC
Gate-Source Charge	Q _{gs}			1.7		
Gate-Drain Charge	Q _{gd}			9		
Internal Gate Resistance	R _{G(int)}	V _{AC} = 25mV, f = 1MHz		6		Ω
Source-Drain Diode characteristics						
Diode Forward Current	I _S	V _{GS} = -4V, T _C = 25°C		7.6		A
Diode Forward voltage	V _{SD}	V _{GS} = -4V, I _{SD} = 1A		3.7		V
		V _{GS} = -4V, I _{SD} = 1A, T _J = 175°C		3.3		

Typical Characteristics

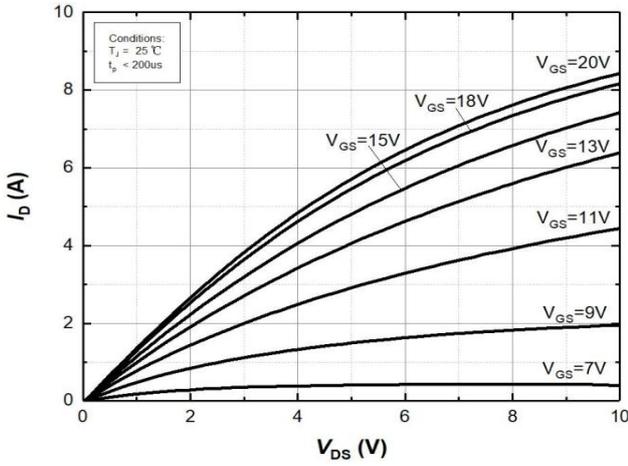


Figure 1. Output characteristics at $T_j=25^\circ\text{C}$

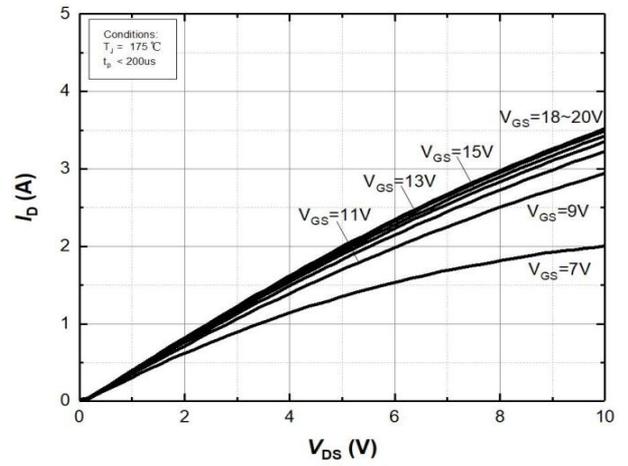


Figure 2. Output characteristics at $T_j=175^\circ\text{C}$

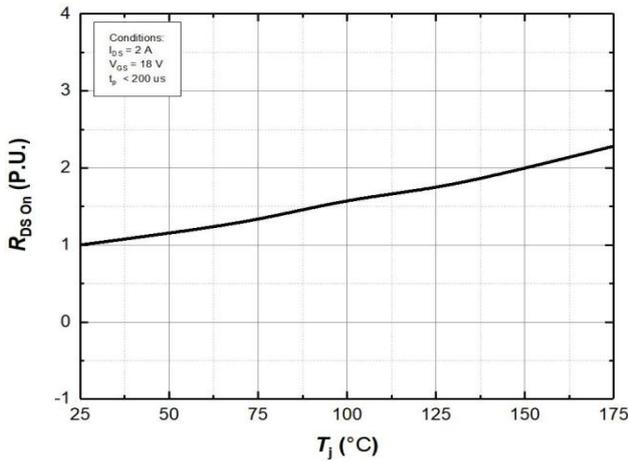


Figure 3. Normalized On-Resistance vs. Temperature

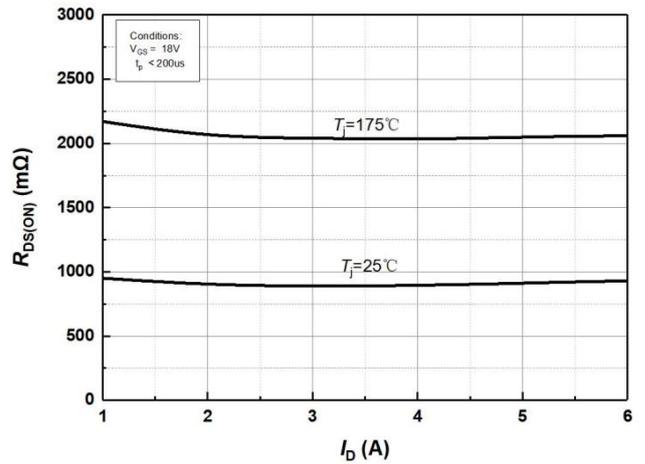


Figure 4. On-Resistance vs. Drain current for Various Temperature

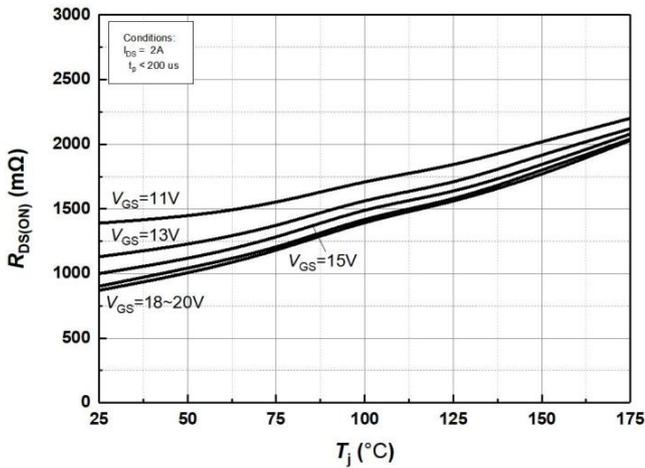


Figure 5. On-Resistance vs. Temperature for Various Gate Voltage

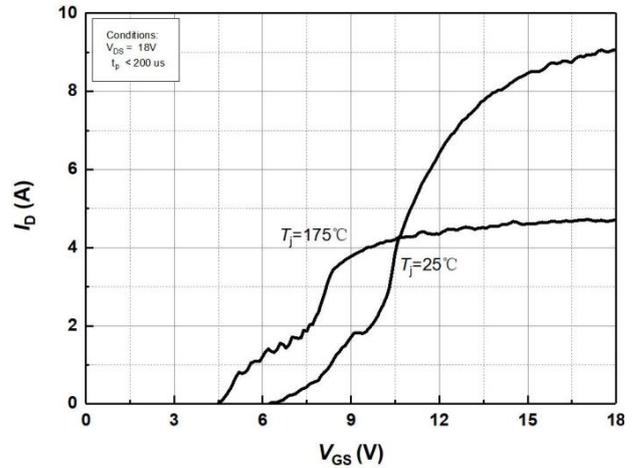


Figure 6. Transfer Characteristics for Various Junction Temperatures

Typical Characteristics

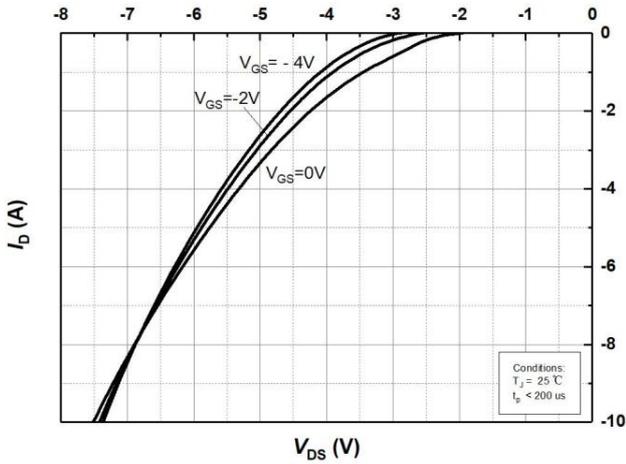


Figure 7. Body Diode Characteristics at Tj=25°C

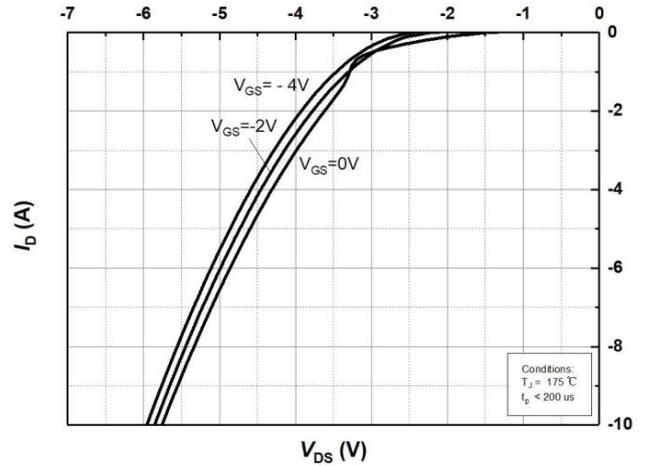


Figure 8. Body Diode Characteristics at Tj=175°C

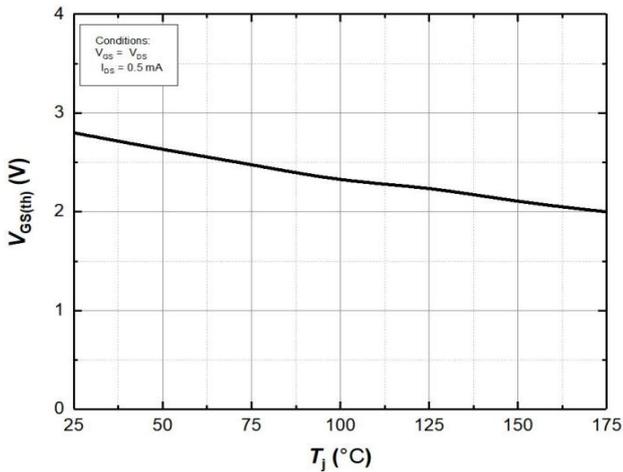


Figure 9. Threshold Voltage vs. Temperature

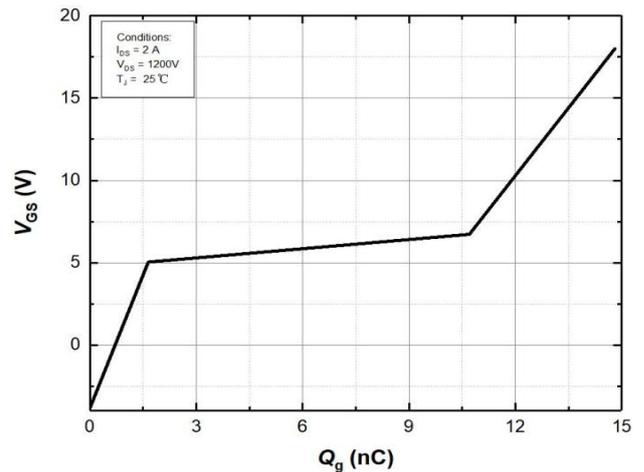


Figure 10 Gate Charge Characteristics

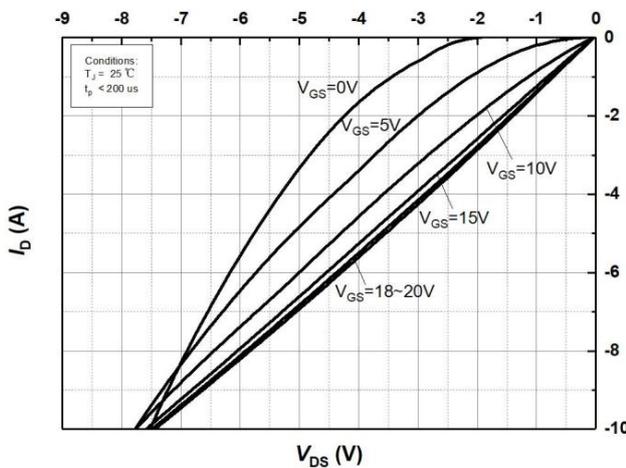


Figure 11. 3rd Quadrant Characteristic at Tj=25°C

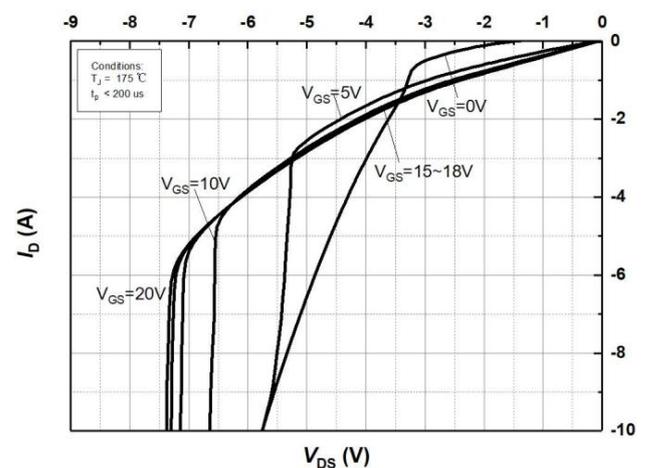


Figure 12. 3rd Quadrant Characteristic at Tj=175°C

Typical Characteristics

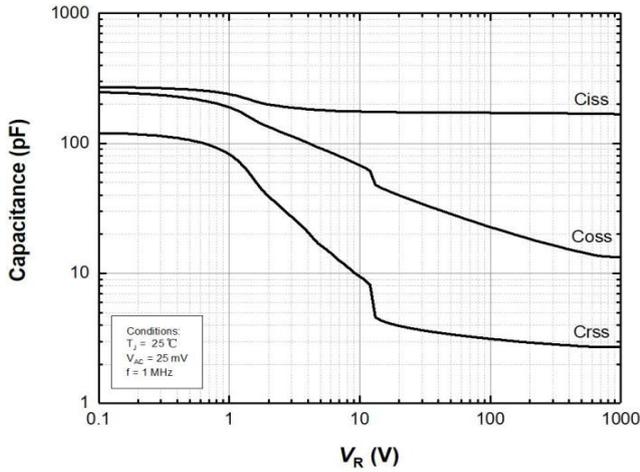


Figure 13. Capacitances vs. Drain-Source Voltage (0 – 1000V)

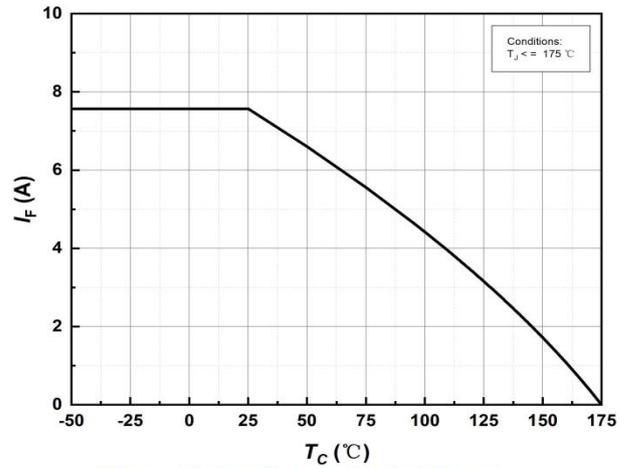


Figure 14. Continuous Drain Current Derating vs Case Temperature

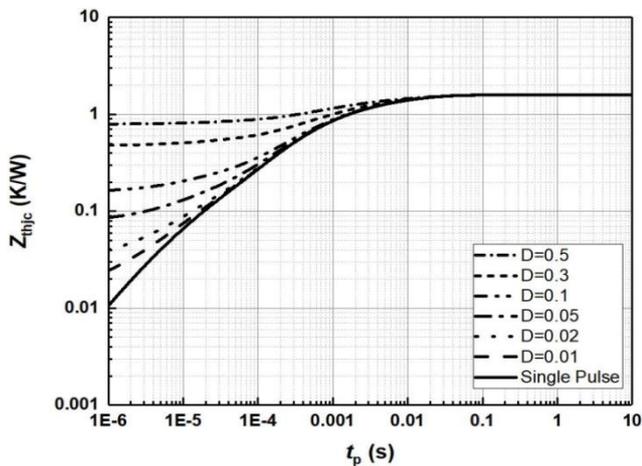


Figure 15. Transient Thermal Impedance (Junction – Case)

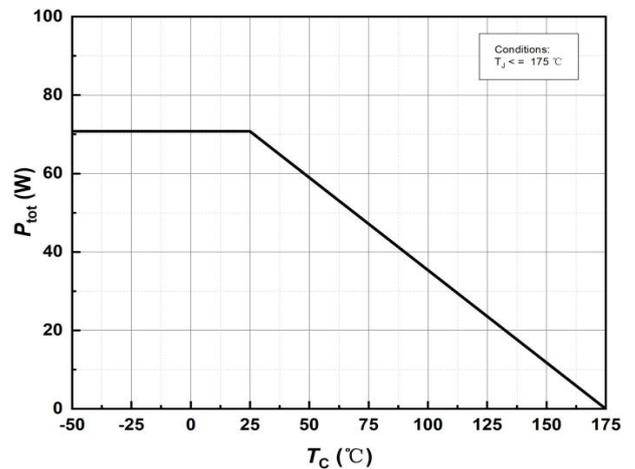


Figure 16. Maximum Power Dissipation Derating vs. Case Temperature

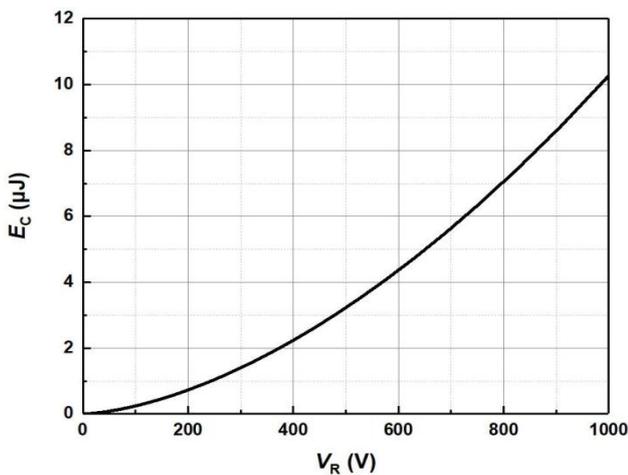


Figure 17. Output Capacitor Stored Energy

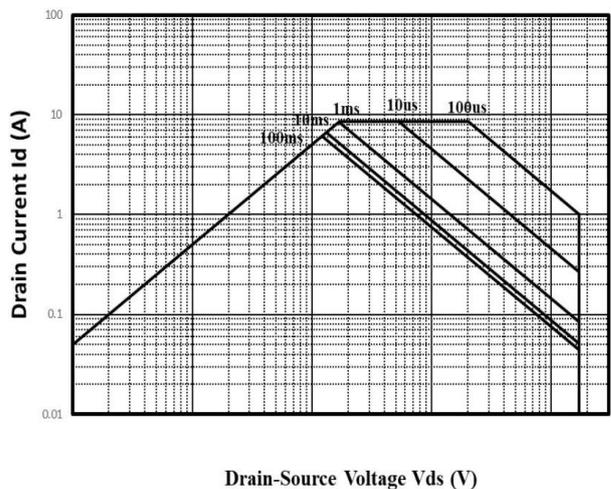
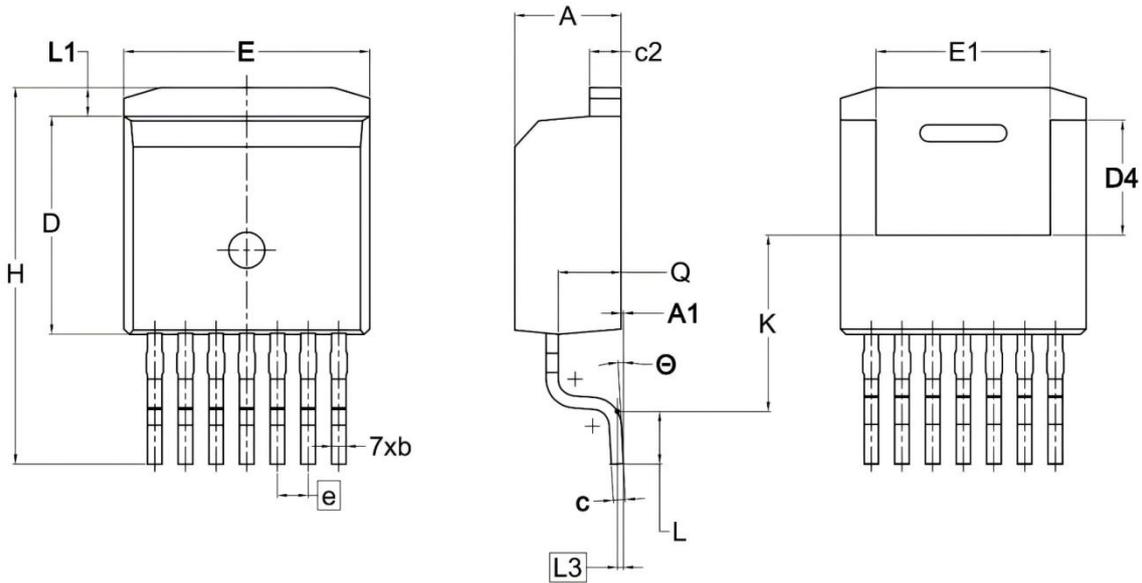


Figure 18. Safe Operating Area

TO-263-7L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.500	0.169	0.177
A1	0.000	0.250	0.000	0.010
b	0.500	0.700	0.020	0.028
c	0.450	0.600	0.018	0.024
c2	1.200	1.400	0.047	0.055
D	8.930	9.230	0.352	0.363
D4	4.650	4.950	0.183	0.195
E	10.080	10.280	0.397	0.405
E1	6.820	7.620	0.269	0.300
e	1.270 BSC.		0.050 BSC.	
H	15.000	16.000	0.591	0.630
K	7.300 BSC.		0.287 BSC.	
L	1.900	2.500	0.075	0.098
L1	1.000	1.400	0.039	0.055
L3	0.250 BSC.		0.010 BSC.	
Q	2.450	2.750	0.096	0.108
θ	0°	7°	0°	7°