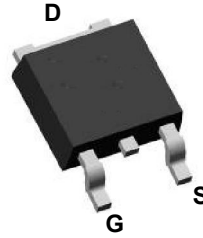
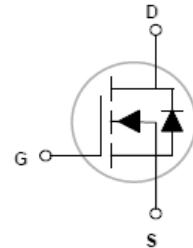


Main Product Characteristics

V_{DS}	30V
$R_{DS(ON)}$	5.5m Ω
I_D	100A



TO-252 (DPAK)



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The GSFD03100 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous(Silicon limited)	I_D	100	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)		70	A
Drain Current-Pulsed	I_{DM}	400	A
Single Pulse Avalanche Energy ⁵	E_{AS}	350	mJ
Maximum Power Dissipation	P_D	110	W
Derating Factor		0.73	W/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	1.36	$^\circ\text{C}/\text{W}$
Storage Temperature Range	T_{STG}	-55 To +175	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 To +175	$^\circ\text{C}$

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics³						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	4.0	5.5	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	4.2	6.0	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.6	3.0	V
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=20A$	50	-	-	S
Dynamic and Switching Characteristics⁴						
Total Gate Charge	Q_g	$V_{DS}=15V, I_D=30A, V_{GS}=10V$	-	70	-	nC
Gate-Source Charge	Q_{gs}		-	8.8	-	
Gate-Drain Charge	Q_{gd}		-	16.3	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=15V, R_{GEN}=1.8\Omega, V_{GS}=4.5V, I_D=60A$	-	11	-	nS
Turn-On Rise Time	t_r		-	160	-	
Turn-Off Delay Time	$t_{d(off)}$		-	25	-	
Turn-Off Fall Time	t_f		-	60	-	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, F=1MHz$	-	3400	-	pF
Output Capacitance	C_{oss}		-	356	-	
Reverse Transfer Capacitance	C_{rss}		-	308	-	
Drain-Source Diode Characteristics						
Diode Forward Current ²	I_S		-	-	100	A
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=20A$	-	-	1.2	V
Reverse Recovery Time	T_{rr}	$T_J=25^\circ\text{C}, I_F=I_S=60A, di/dt=100A/\mu s^3$	-	56	-	nS
Reverse Recovery Charge	Q_{rr}		-	110	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on is negligible(turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design.
5. EAS condition : $T_J=25^\circ\text{C}, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25\Omega$

Typical Electrical and Thermal Characteristic Curves

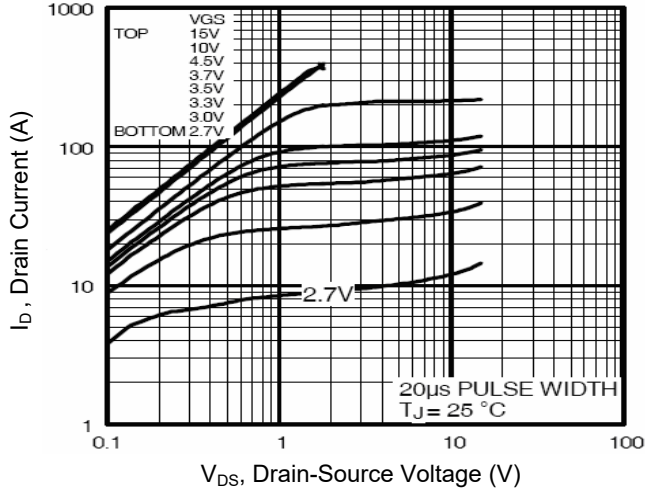


Figure 1. Output Characteristics

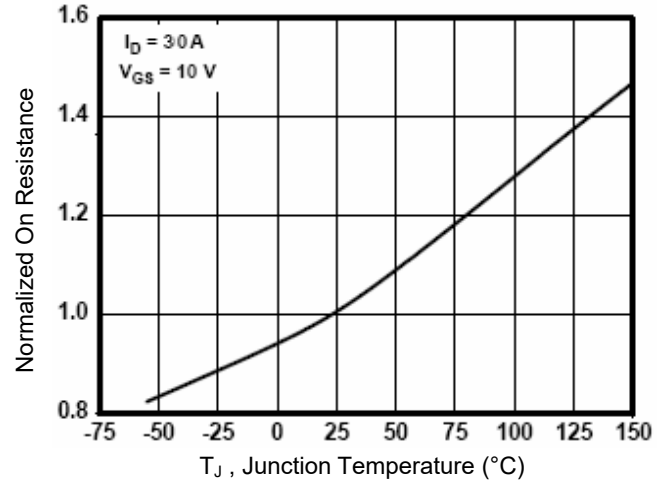


Figure 2. Rdson-Junction Temperature

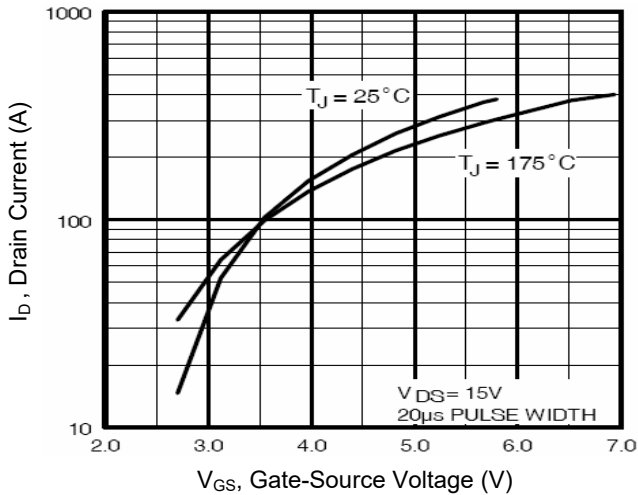


Figure 3. Transfer Characteristics

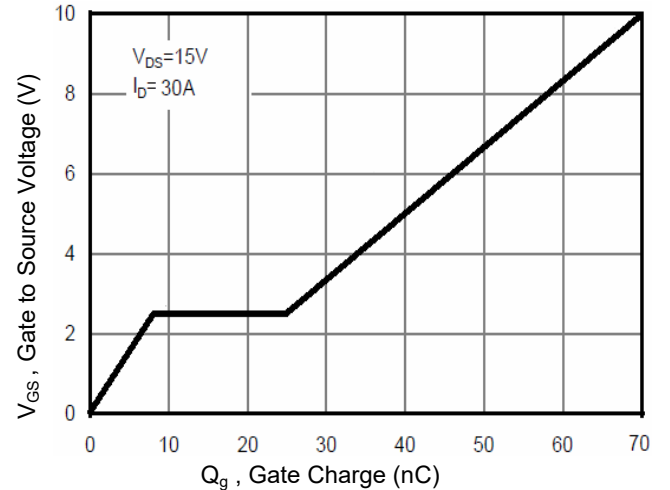


Figure 4. Gate Charge

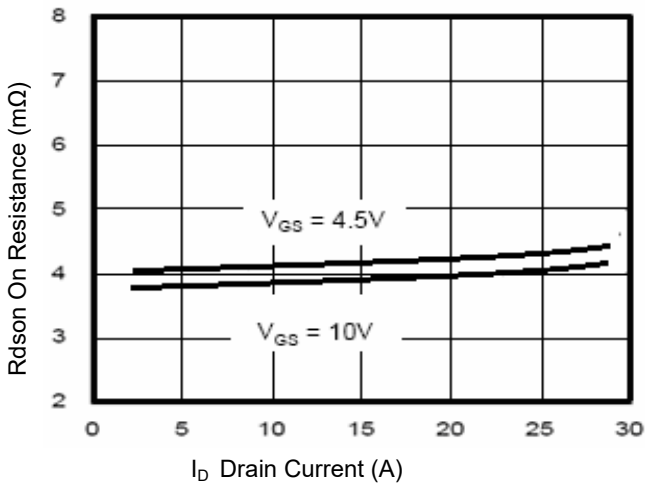


Figure 5. Rdson-Drain Current

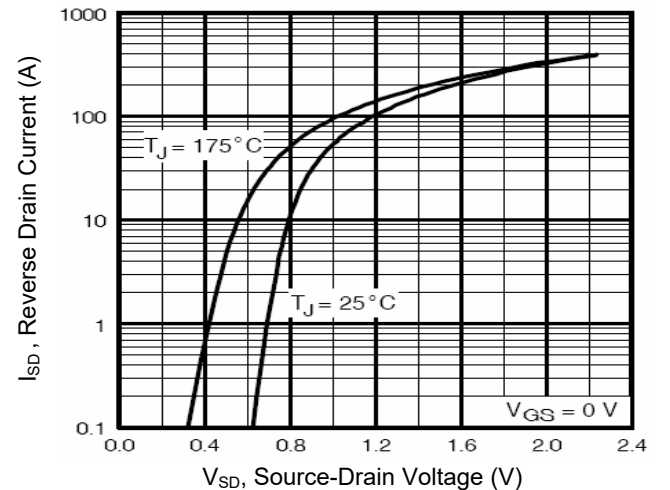


Figure 6. Source-Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

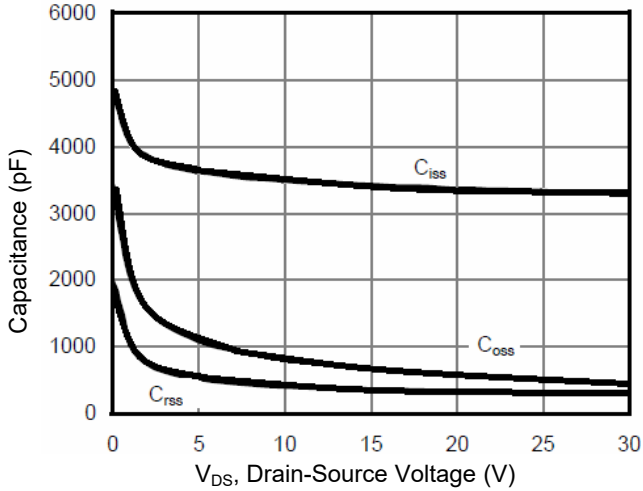


Figure 7. Capacitance Characteristics

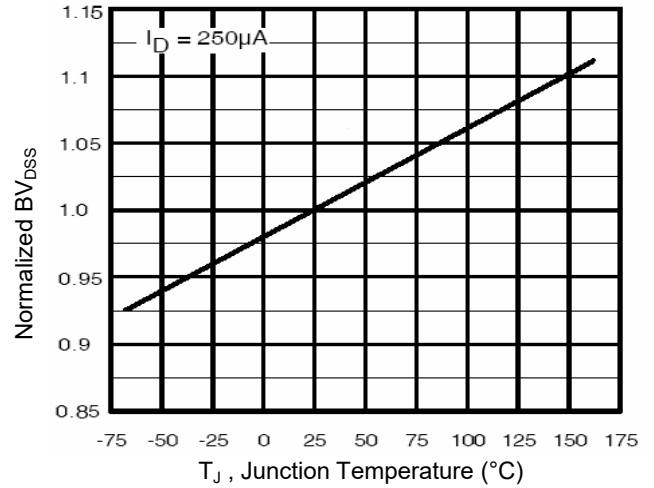


Figure 8. BV_{DSS} Vs. Junction Temperature

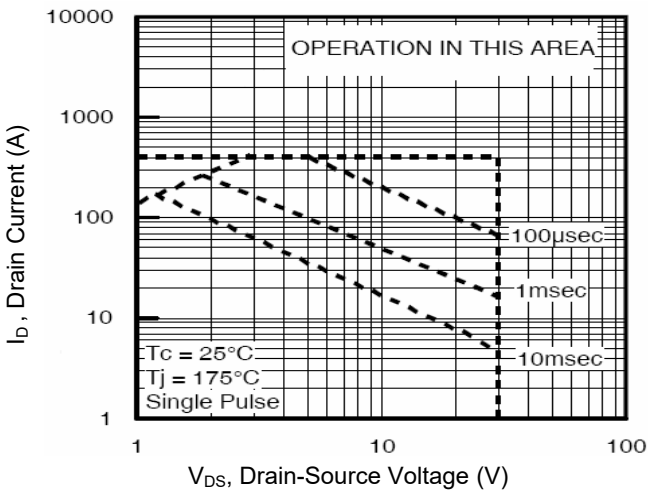


Figure 9. Safe Operation Area

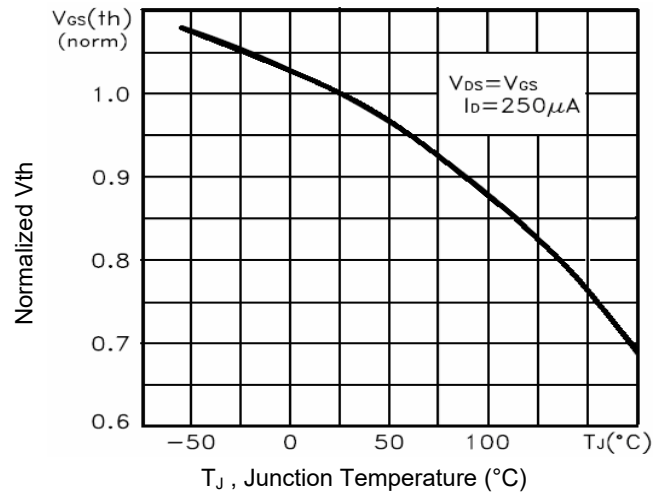


Figure 10. V_{th} Vs. Junction Temperature

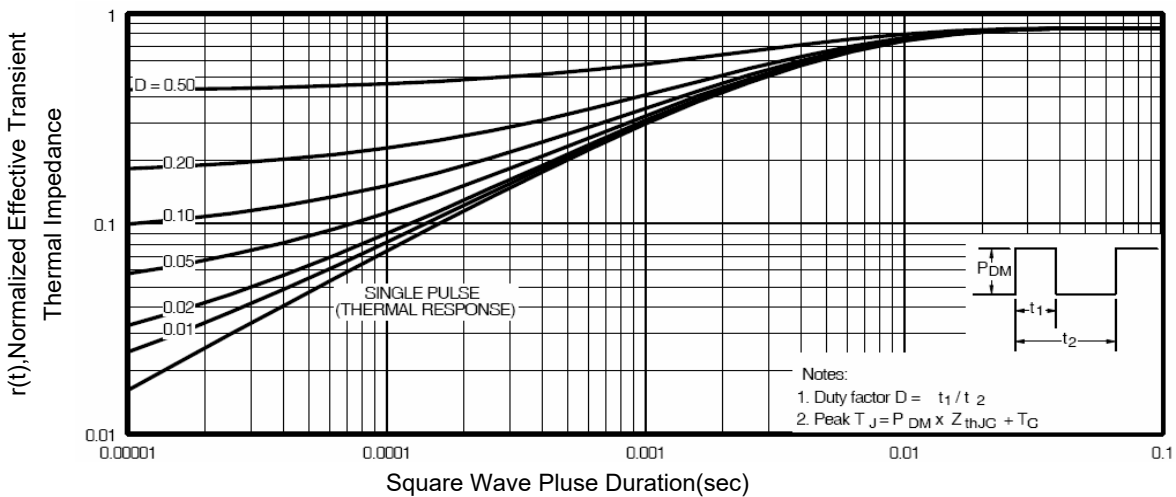


Figure 11. Normalized Maximum Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

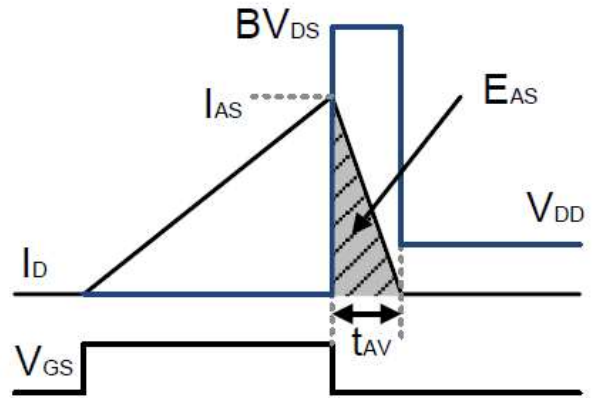
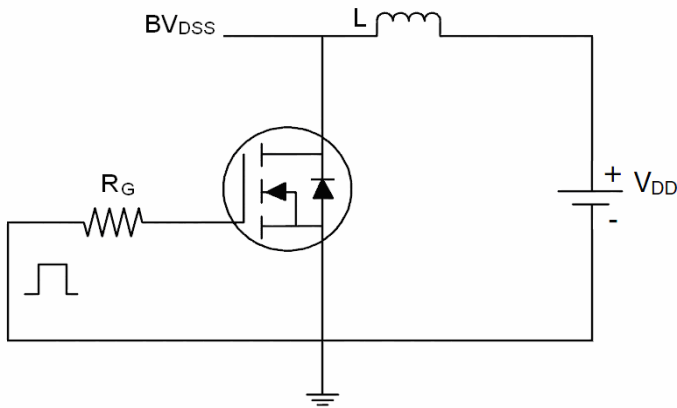


Figure 12. E_{AS} Test Circuit and waveforms

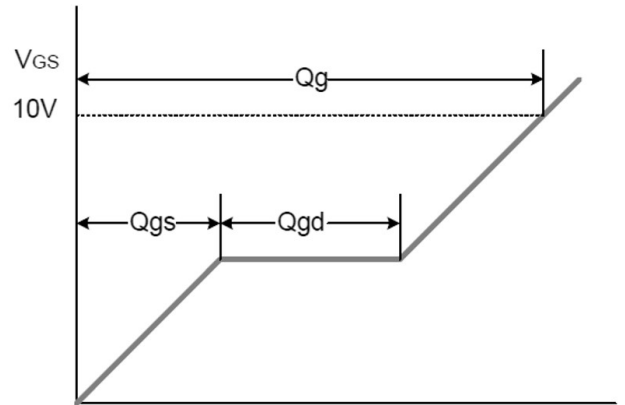
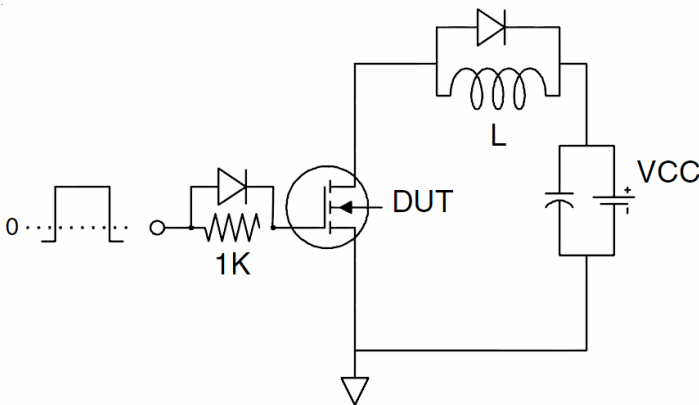


Figure 13. Gate Charge Test Circuit and waveforms

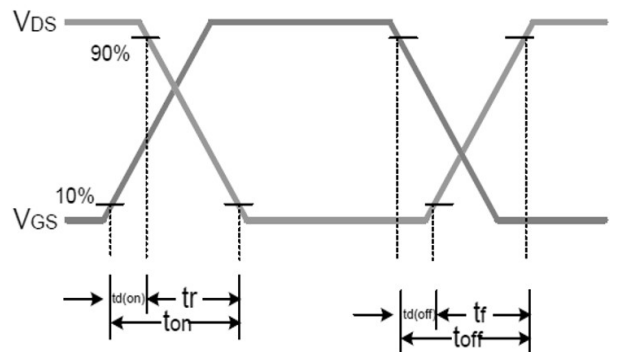
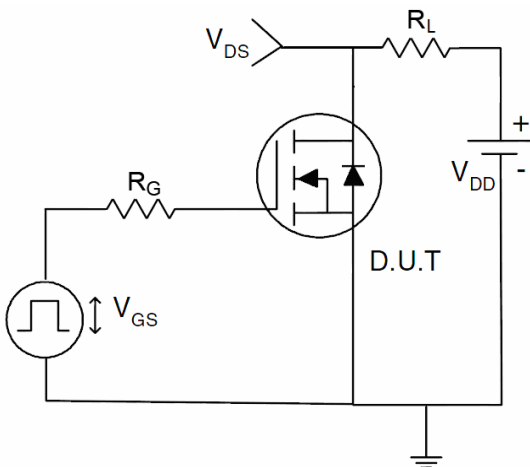
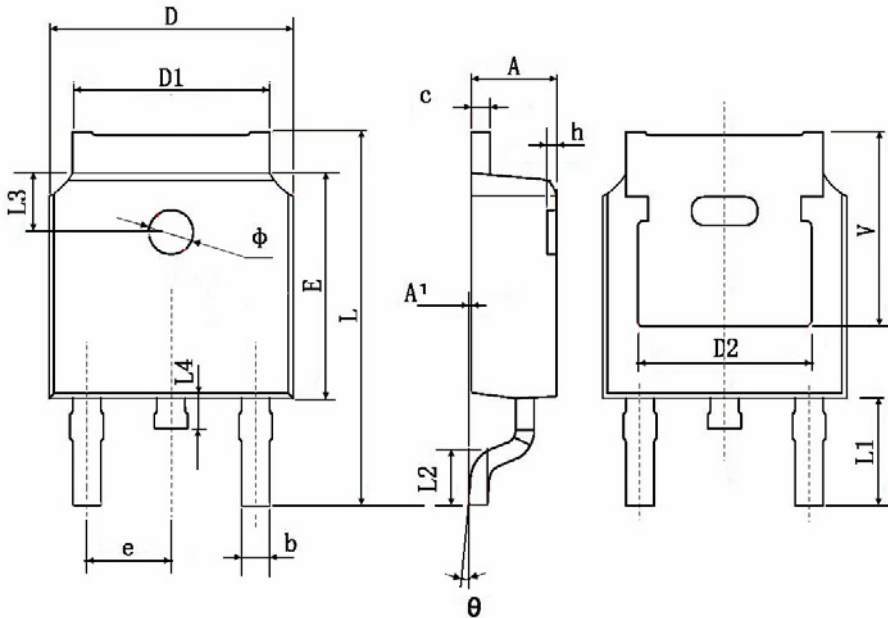


Figure 14. Switch Time Test Circuit and waveforms

Package Outline Dimensions (TO-252/DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	