N-Channel 100V MOSFET

E100N4P0OL1

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
100V	4 @ V_{GS} = 10V	86

TOLL-8

Features

- Low $R_{DS(on)}$ trench technology

- Low thermal impedance

- Fast switching speed

- 100% avalanche tested

Applications

- DC/DC conversion

- Power switch

- BMS

- Moto driver

Package And Ordering Information

Ordering code	Package	Marking
E100N4P0OL1	TOLL-8	E100N4P0OL1

Ordering Information

Package	Units/ Reel	Reels/ Inner Box	Units/ Inner Box
TOLL-8	2000	1	2000

Key Performance Parameters

Parameter	Value	Unit
VDS, min @ Tj(max)	100	V
ID, pulse	344	A
RDS(ON), max @ VGS=10V	4	mΩ
Qg	74.2	nC

Absolute Maximum Ratings at Tj=25°C Unless Otherwise Noted

Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	±20	
Continuous drain current	T_C=25°C	I_D	86	A
	T_C=100°C		-	
Pulsed drain current		$I_{D,pulse}$	344	
Avalanche energy, single pulse		E_{AS}	450	mJ
Power dissipation	T_C=25°C	P_D	52	W
	T_A=25°C		-	
Operating junction and storage temperature range		T_J, T_{stg}	–55 to +150	°C

Thermal Characteristics

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	2.4	°C/W
Thermal resistance, junction-to-ambient	Steady state	$R_{\theta JA}$	40	

Electrical Characteristics at Tj=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Drain to source breakdown voltage	$V_{(BR)DSS}$	100			V	V_{GS} = 0, I_D = 250 µA
Gate-source threshold voltage	$V_{GS}(th)$	1.4	1.9	2.4	V	V_{DS} = V_{GS}, I_D = 250 µA
Gate-body leakage	I_{GSS}			±100	nA	V_{DS} = 0 V, V_{GS} = ±20 V
Zero gate voltage drain current	I_{DSS}			1	µA	V_{DS} = 80 V, V_{GS} = 0 V
Drain-source on-resistance	$R_{DS}(on)$		3.6	4	mΩ	V_{GS} = 10 V, I_D = 20 A
Drain-source on-resistance	$R_{DS}(on)$		4.9	5.8	mΩ	V_{GS} = 4.5 V, I_D = 15 A

Forward transconductance	gfs		110		S	V_{DS} = 5 V, I_D = 30 A
Gate resistance	Rg		1.2		Ω	f=1MHz
Gate Charge						
Total gate charge	Qg		74.2			
Gate-source charge	Qgs		13.5		nC	V_{DS} = 25 V, I_D = 30 A, V_{GS} = 10 V
Gate-drain charge	Qgd		21.6			
Dynamic						
Turn-on delay time	$t_{d(on)}$		25.8			
Rise time	t_r		45.8		ns	V_{DS} = 25 V, I_D =30 A, V_{GS} = 10 V, R_{GEN} =3.3 Ω
Turn-off delay time	$t_{d(off)}$		23.2			
Fall time	t_f		7.6			
Input capacitance	C_{iss}		4080			
Output capacitance	C_{oss}		1860		pF	V_{DS} =25 V, V_{GS} = 0 V, f = 1MHz
Reverse transfer capacitance	C_{rss}		158			
Body Diode						
Diode forward voltage	V_{SD}			1.2	V	V_{GS} = 0 V, I_F = 20 A
Reverse recovery time	t_{rr}		48.7		ns	V_R= 50 V, I_S =30 A, di/dt = 100 A/μs
Reverse recovery charge	Q_{rr}		107.6		nC	

Electrical Characteristics Diagrams

Figure 1. On-Region Characteristics
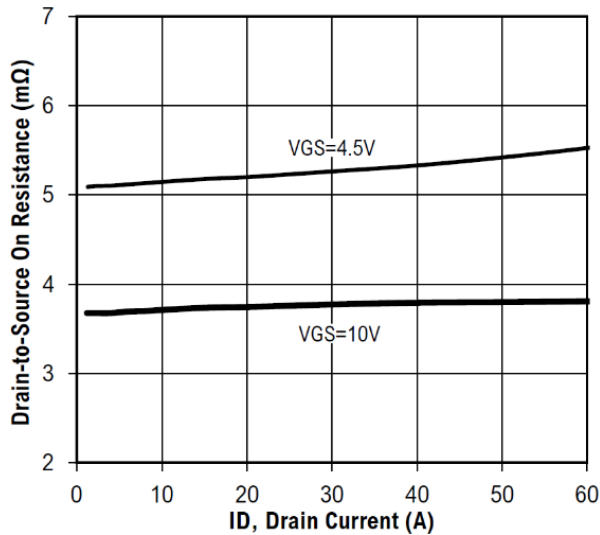
Figure 2. Transfer Characteristics
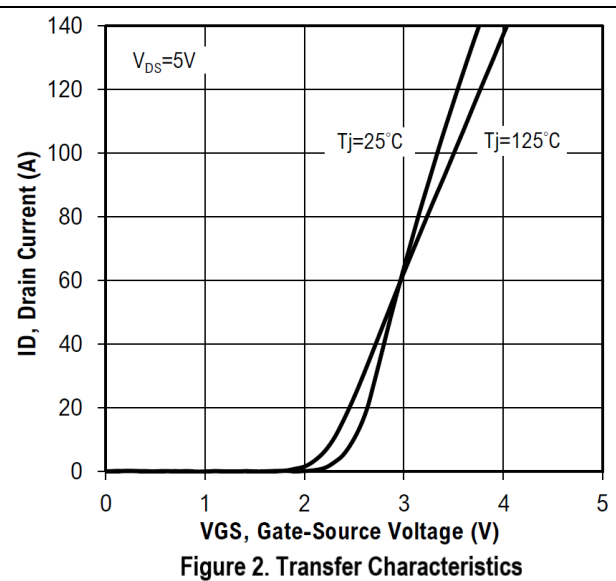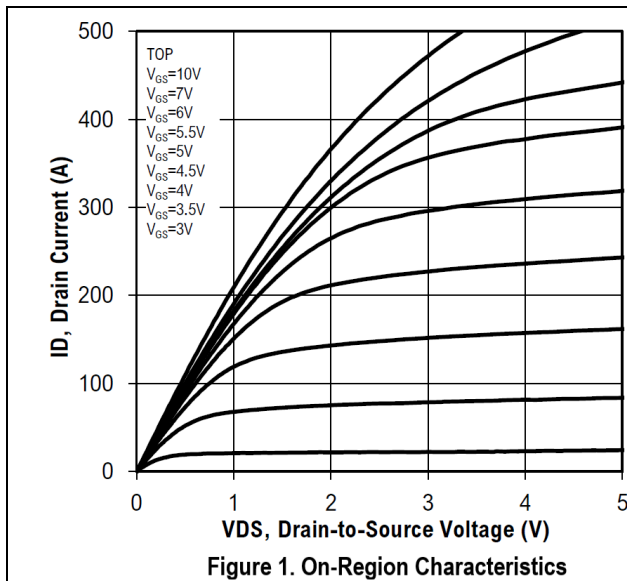
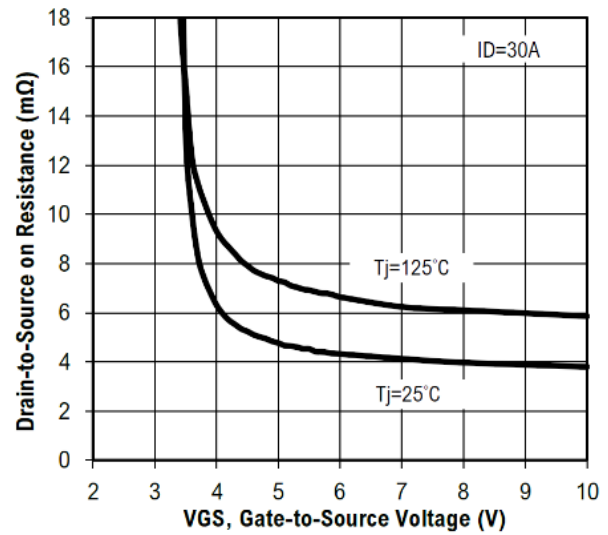Figure 3. On-Resistance vs. Drain Current and Gate

Figure 4. On-Resistance vs. Gate-Source Voltage
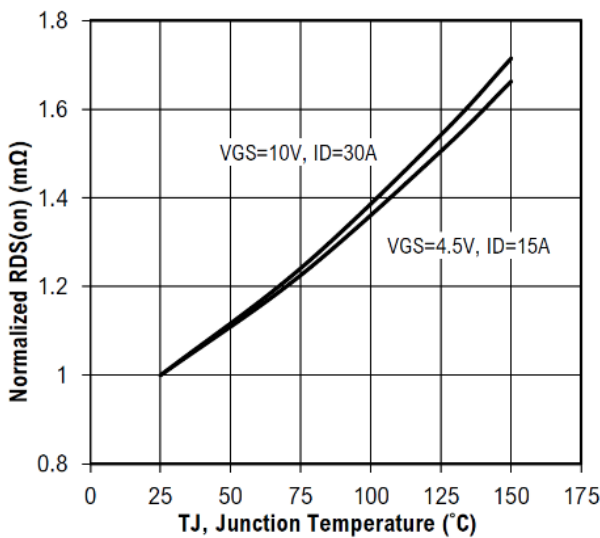

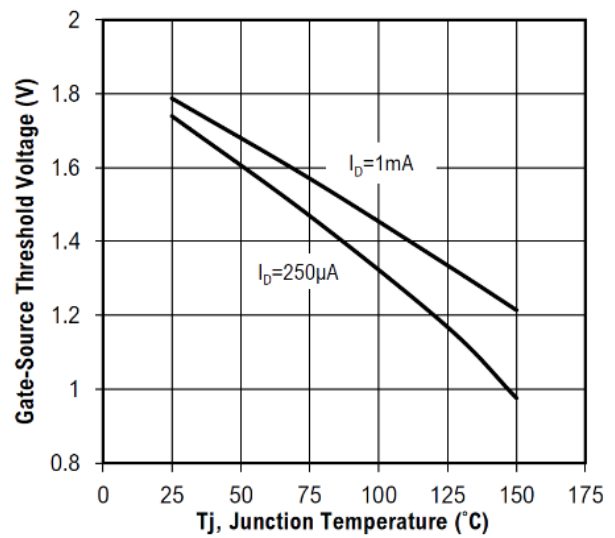Figure 5. On-Resistance vs. Junction Temperature
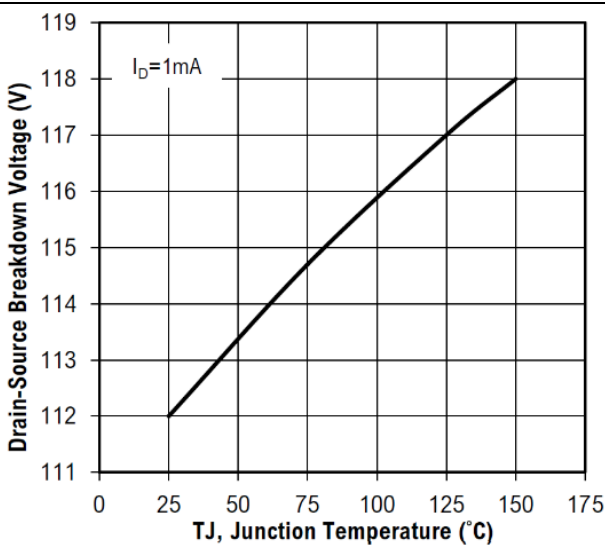

Figure 6. Gate Threshold Voltage

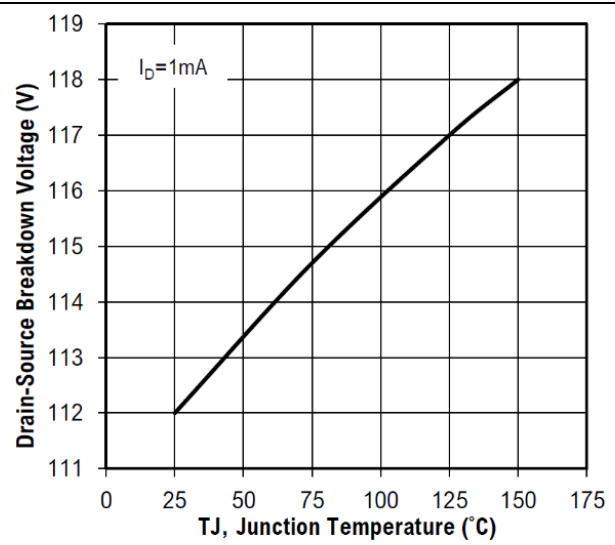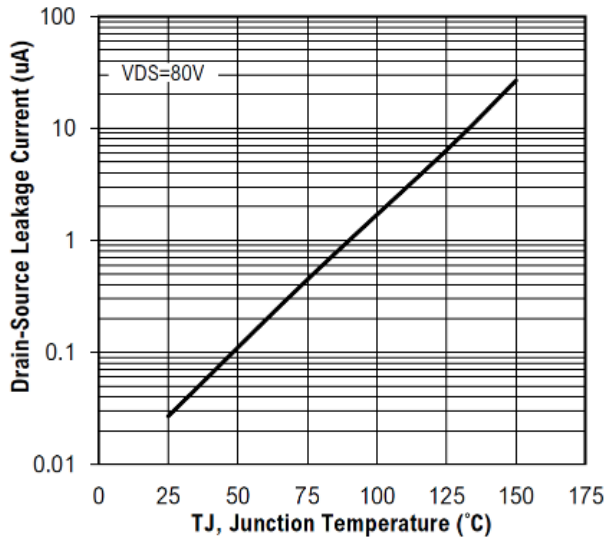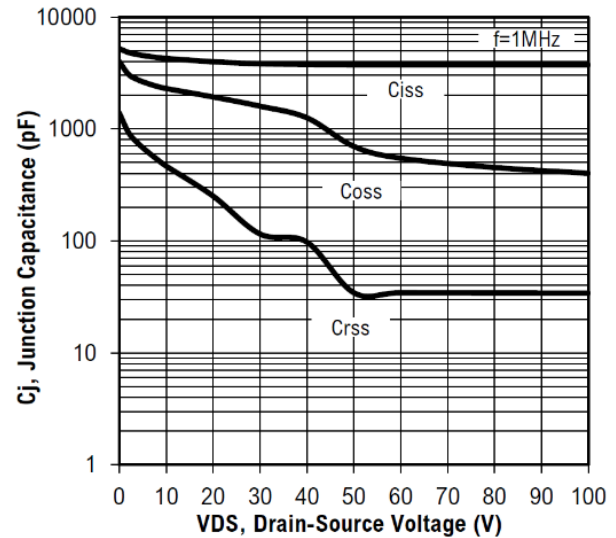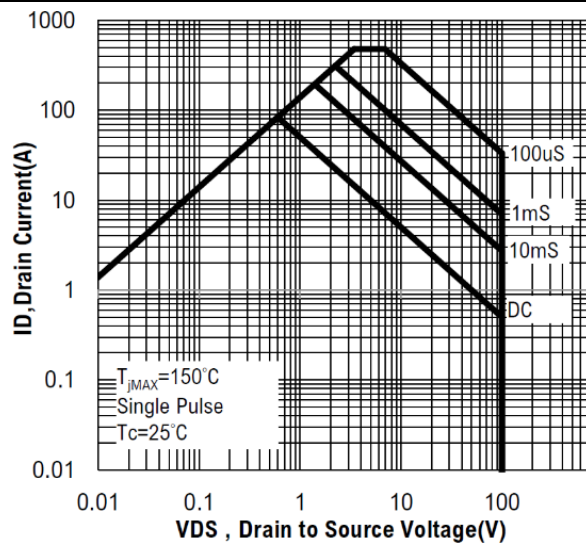Figure 7. Drain-source breakdown voltage vs. Junction Temperature
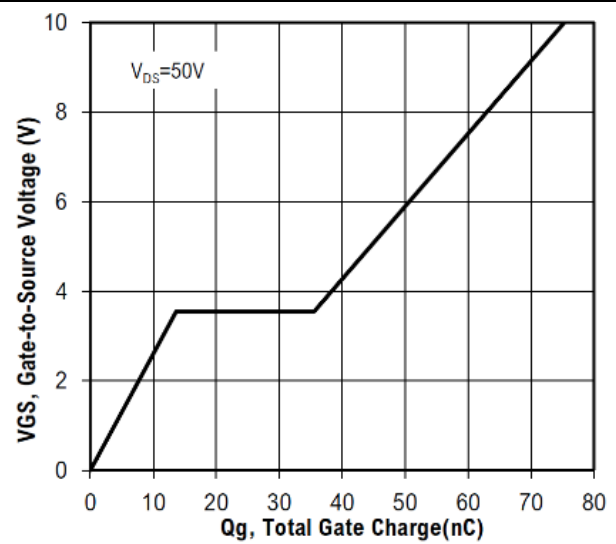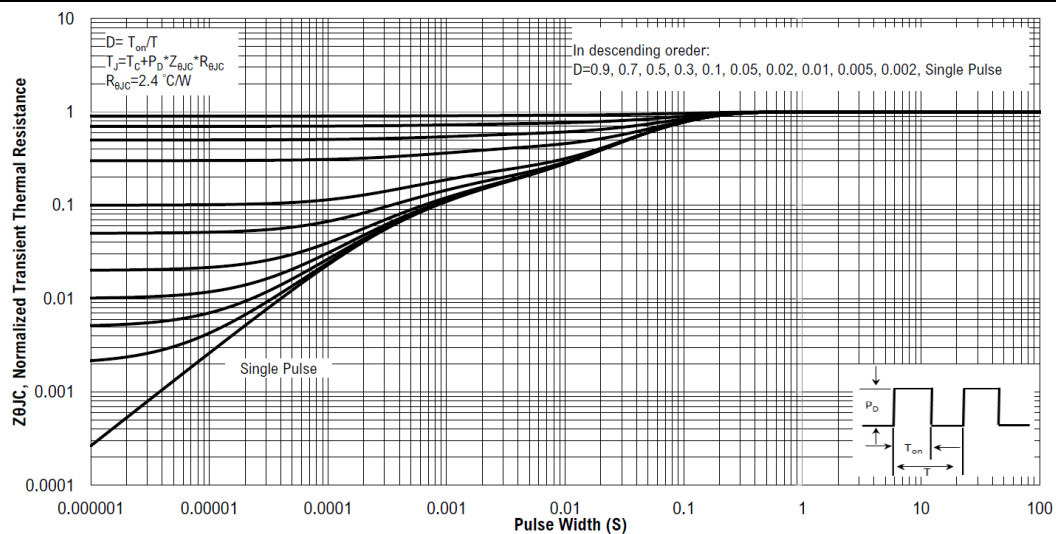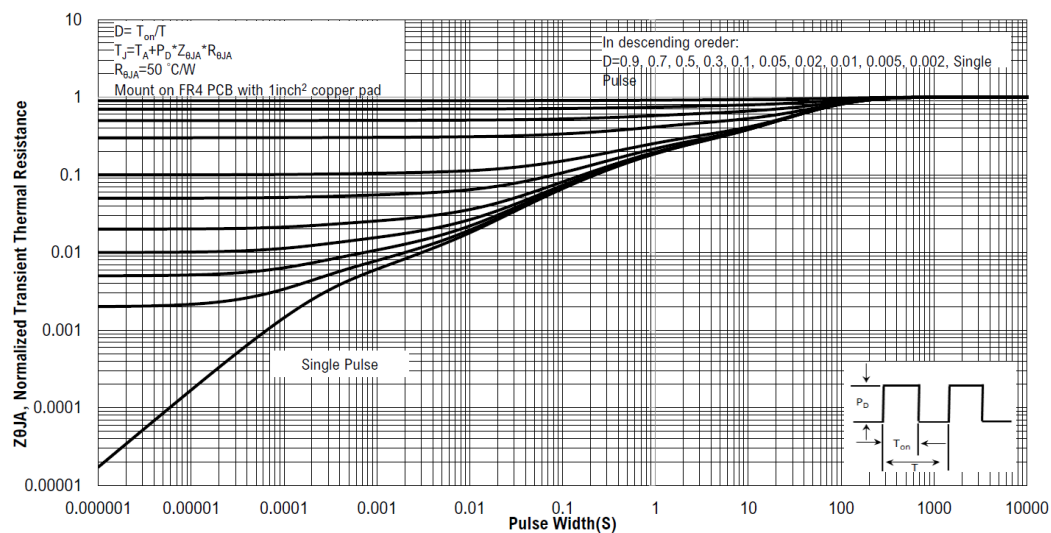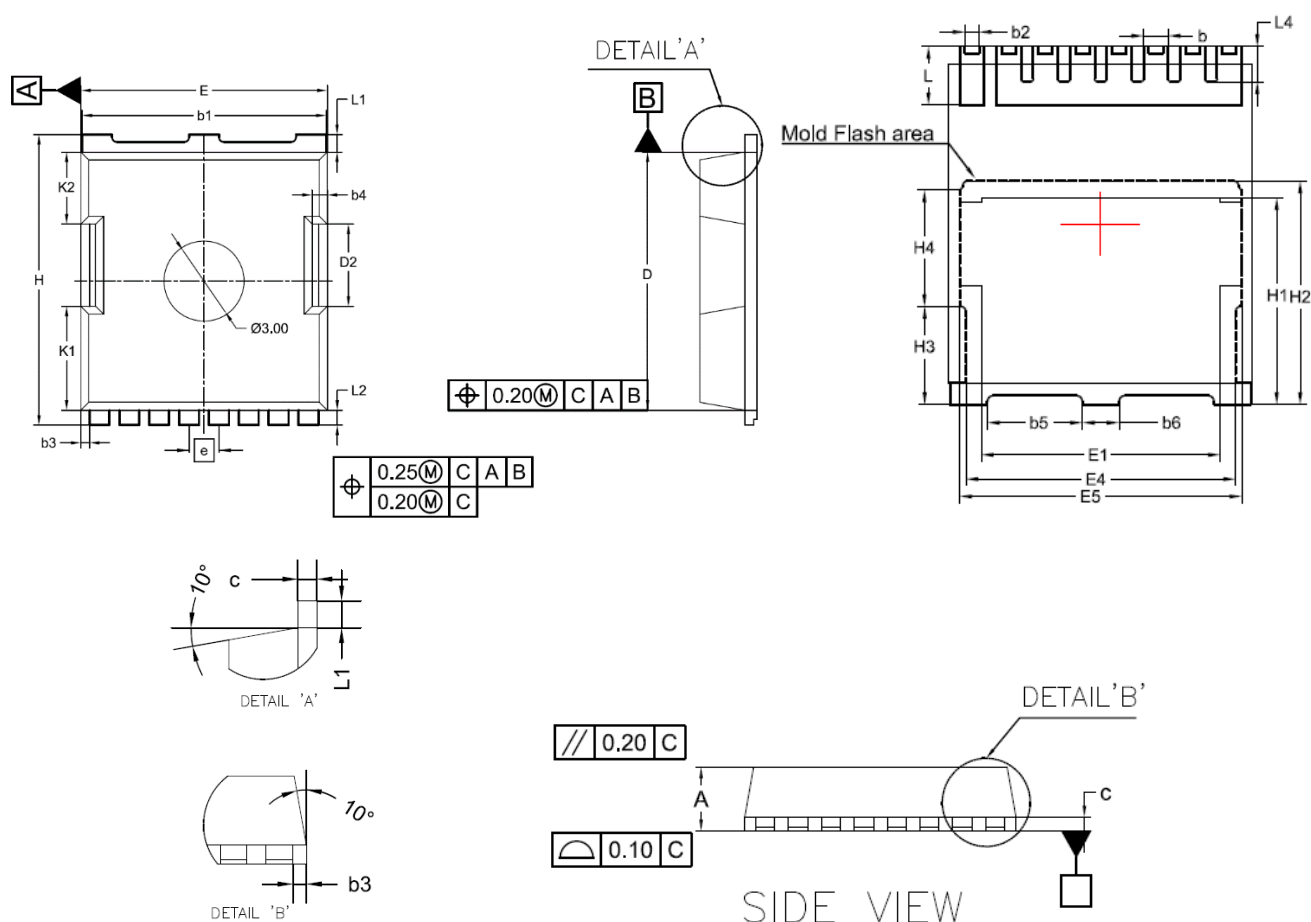

Figure 8. Body-Diode Characteristics

Figure 9. Zero Gate Voltage Drain Current vs. Junction Temperature

Figure 10. Capacitance vs. Drain to Source Voltage

Figure 11. Maximum Forward Biased Safe Operating Area

Figure 12. Gate-Charge Characteristics

Figure 13. Transient Thermal Resistance

Figure 14. Transient Thermal Resistance

Package Outline Dimensions

SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
* A	2.200	2.300	2.400	0.087	0.091	0.094
c	0.492	0.500	0.508	0.019	0.020	0.020
* D	10.280	10.380	10.480	0.405	0.409	0.413
* E	9.800	9.900	10.000	0.386	0.390	0.394
e		1.20 BSC			0.047 BSC	
* H	11.580	11.680	11.780	0.456	0.460	0.464
H1	6.650	6.750	6.850	0.262	0.266	0.270
H2		7.300			0.287	
H3		3.200			0.126	
H4		3.800			0.150	
K1		4.180			0.165	
K2		2.900			0.114	
* D2		3.300			0.130	
b	0.700	0.800	0.900	0.028	0.031	0.035
b1	9.700	9.800	9.900	0.382	0.386	0.390
b2	0.420	0.460	0.500	0.017	0.018	0.020
b3		0.350			0.014	
b4		0.600			0.024	
b5		3.100			0.122	
b6		1.200			0.047	
L	1.700	1.900	2.100	0.067	0.075	0.083
L1		0.700			0.028	
L2		0.600			0.024	
L4	1.050	1.150	1.250	0.041	0.045	0.049
L5	0.500	0.600	0.700	0.020	0.024	0.028
E1		7.800			0.31	
E4		8.800			0.35	
E5		9.200			0.36	

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