CRMJTL1090A

N-Channel 100V, 75mΩ Typ. Power MOSFET

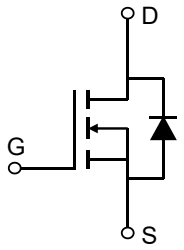
Description

Features

- 100V, 3.8A

  $R_{DS(ON)}$ Typ = 75mΩ @ V_{GS} = 10V

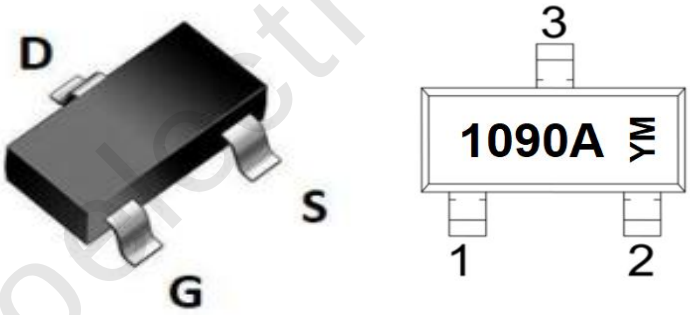
  $R_{DS(ON)}$ Typ = 83mΩ @ V_{GS} = 4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free



Schematic Diagram

Application

- Load Switch
- PWM Application
- Power Management



Marking and Pin Assignment

Package Marking and Ordering Information

Device	Marking	Package	Outline	Reel Size	Reel (pcs)	Per Carton (pcs)
CRMJTL1090A	1090A	SOT-23-3L	TAPING	7"	3000	120000

Absolute Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		100	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A = 25°C	3.8	A
		T_A = 100°C	2.3	A
I_{DM}	Pulsed Drain Current [1]		15	A
P_D	Power Dissipation	T_A = 25°C	3.125	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient[2]		40	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 100V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.2	2	2.4	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 10V, I_D = 3.8A	-	75	98	mΩ
		V_{GS} = 4.5V, I_D = 3A	-	83	108	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	-	1084	-	pF
C_{oss}	Output Capacitance		-	42	-	pF
C_{rss}	Reverse Transfer Capacitance		-	38	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 50V, I_D = 3. 8A	-	22	-	nC
Q_{gs}	Gate Source Charge		-	3	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	6.1	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 50V I_D= 3.8A, R_{GEN} = 3Ω	-	14	-	ns
t_r	Turn-On Rise Time		-	5.5	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	28	-	ns
t_f	Turn-Off Fall Time		-	5.2	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	3.8	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	15.2	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 3.8A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 3.8A, di/dt = 100A/us	-	30	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	42	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Typical Performance Characteristics

Figure 1: Output Characteristics

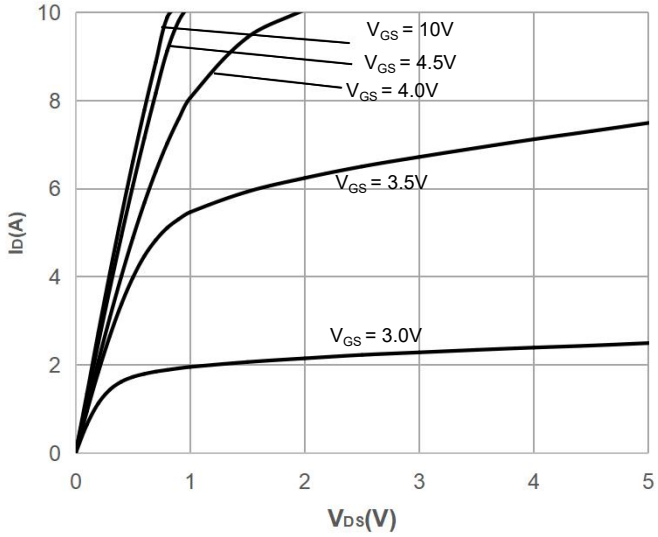


Figure 2: Typical Transfer Characteristics

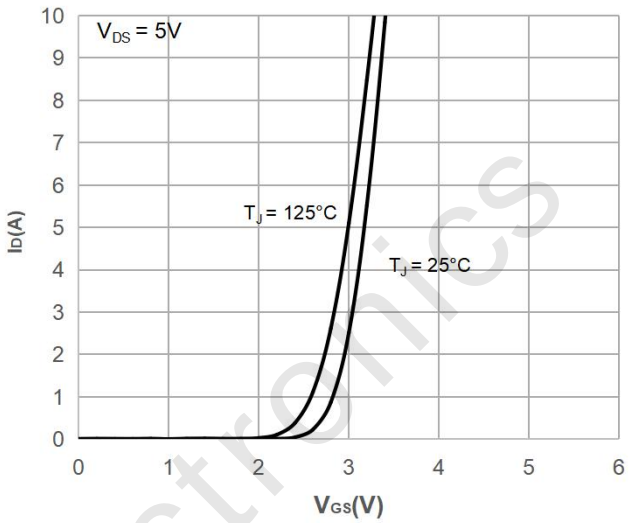


Figure 3: On-resistance vs. Drain Current

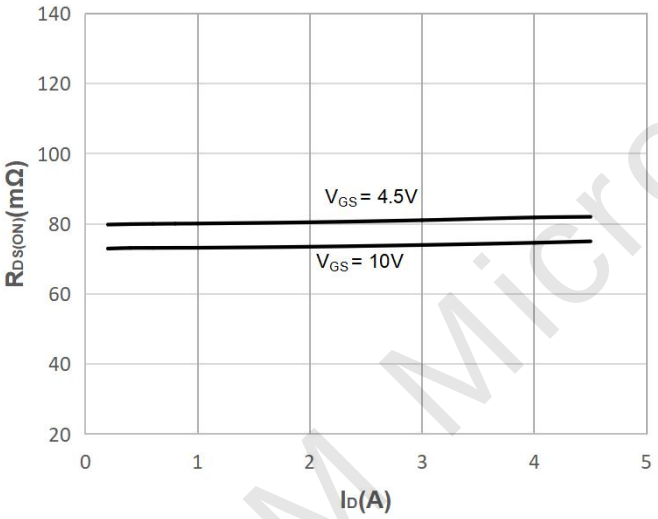


Figure 4: Body Diode Characteristics

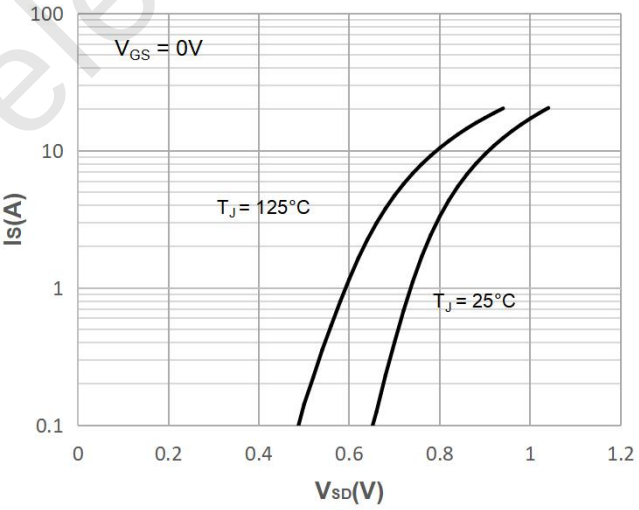


Figure 5: Gate Charge Characteristics

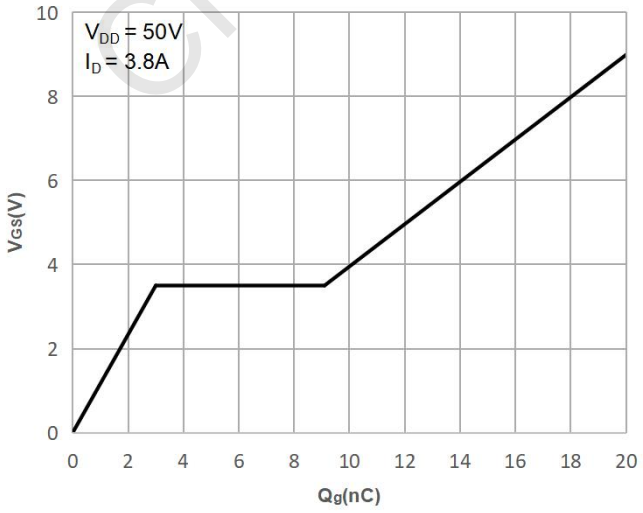
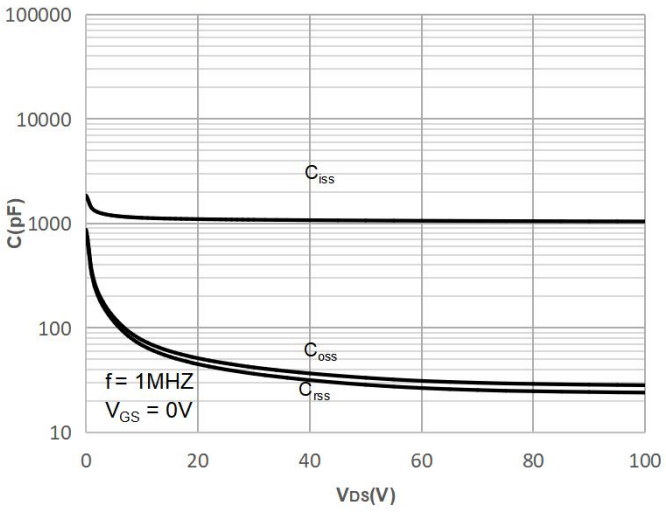


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

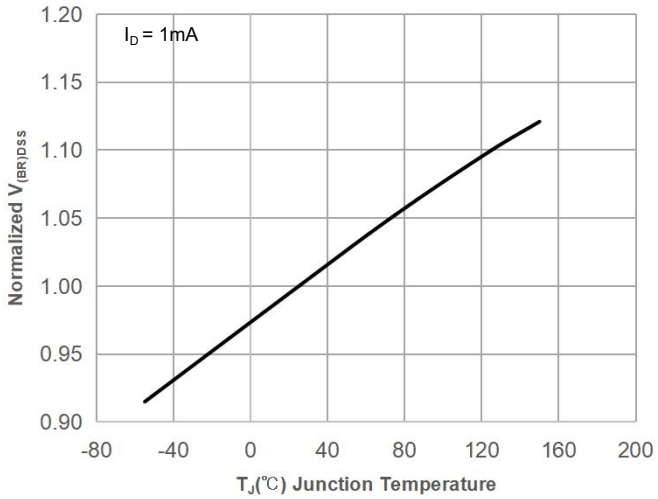


Figure 8: Normalized on Resistance vs. Junction Temperature

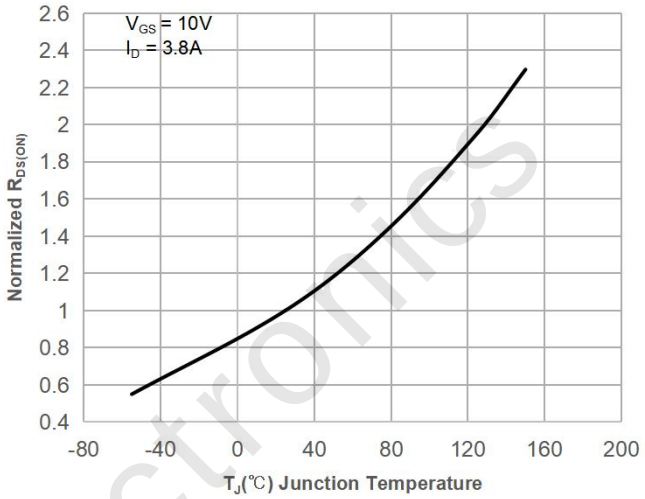


Figure 9: Maximum Safe Operating Area

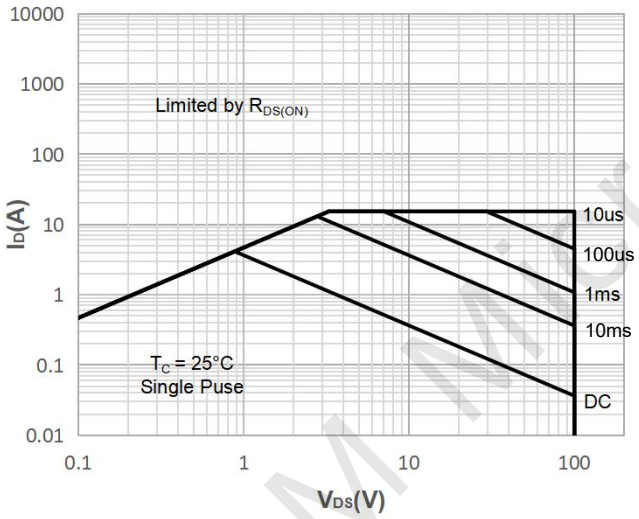


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

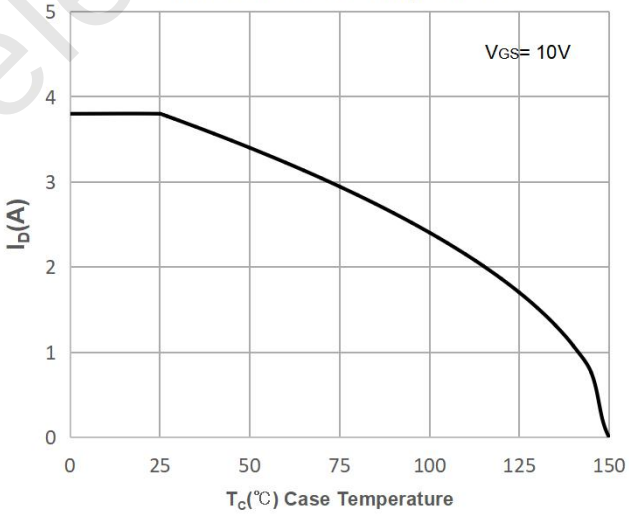


Figure 11: Normalized Maximum Transient Thermal Impedance

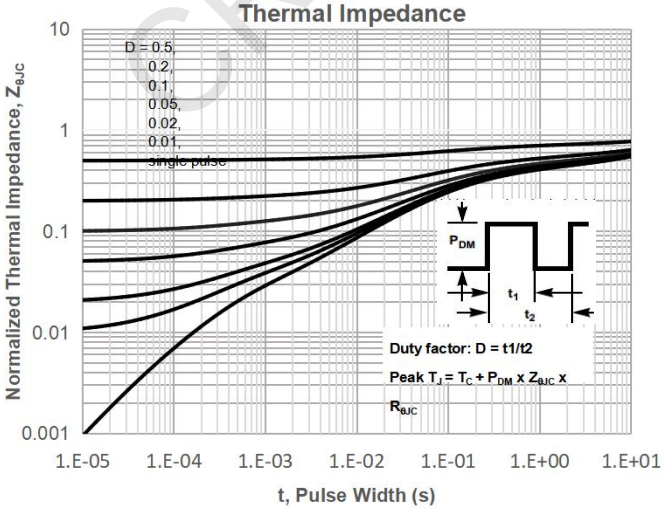
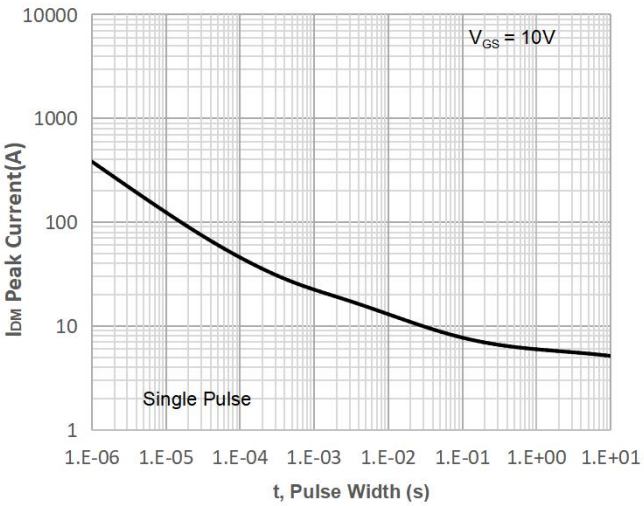


Figure 12: Peak Current Capacity



Test Circuit

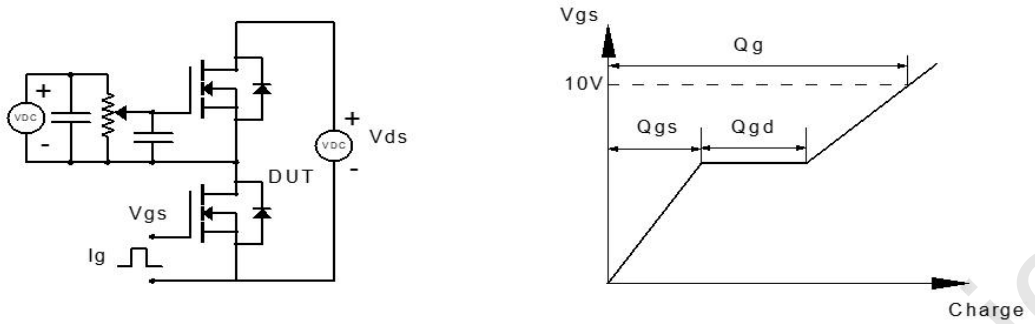


Figure 1: Gate Charge Test Circuit & Waveform

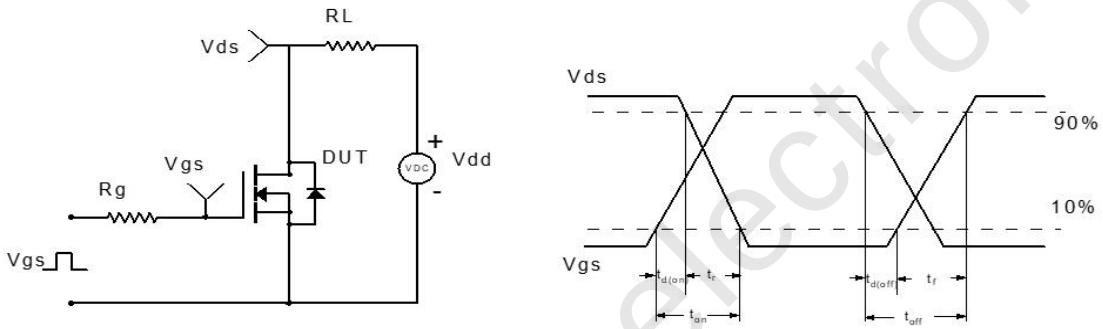


Figure 2: Resistive Switching Test Circuit & Waveform

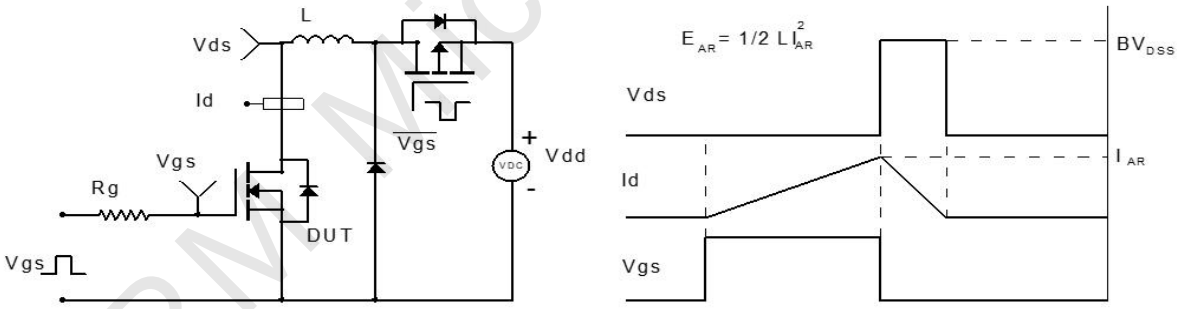


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

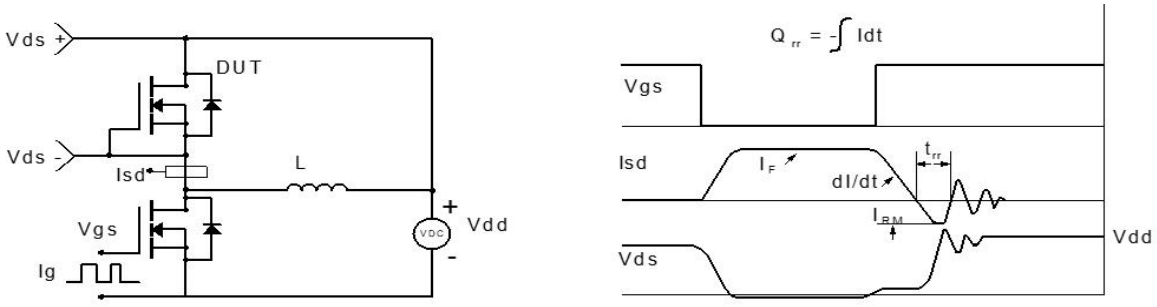
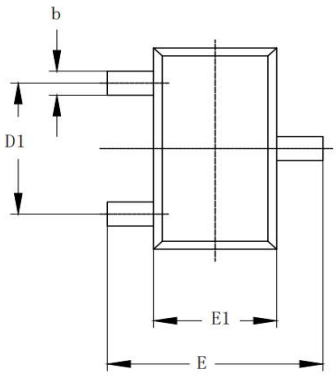
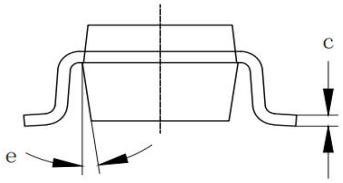
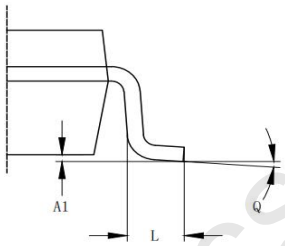


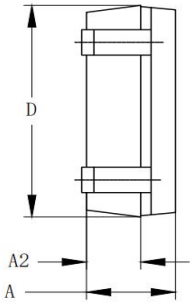
Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOT-23-3L)









COMMON DIMENSION(MM)			
PKG	SOT-23-3L		
SYMBOL	MIN	TYP	MAX
A	1.080	1.100	1.120
A1	0.010	0.060	0.150
A2	0.640	0.670	0.700
b	0.325	0.350	0.375
c	0.125	0.135	0.150
D	2.920	2.930	2.980
D1	1.875	1.900	1.925
E	2.650	2.800	2.950
E1	1.580	1.600	1.670
L	0.300	0.450	0.600
e	8°		
Q	0°	4°	8°

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