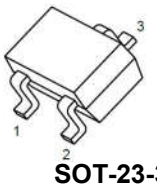
30V N -Channel MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	22mΩ@10V	5.8A
	23mΩ@4.5V	

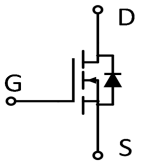


1:GATE
2:SOURCE
3:DRAIN

SOT-23-3L

Features

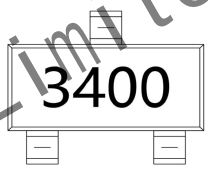
- Very Low On-resistance $R_{DS(ON)}$
- Low Crss
- Fast switching
- Improved dv/dt capability



Circuit diagram

Applications

- PWM Application
- Load Switch
- Power Management



R0 = Device code

Marking (Top View)

Order information

Device	Package	Shipping
AN3400BAL0	SOT-23-3L	3000/Tape&Reel

Absolute maximum ratings

Parameter		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current [1]	T_C = 25℃	I_D	5.8	A
	T_C = 100℃		3.8	A
Drain Current - Pulsed		I_{DM}	23	A
Power Dissipation	T_A = 25℃	P_D	1.36	W
Thermal Resistance, Junction-to-Ambient		$R_{\theta JA}$	92	℃/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	℃
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		TL	300	℃

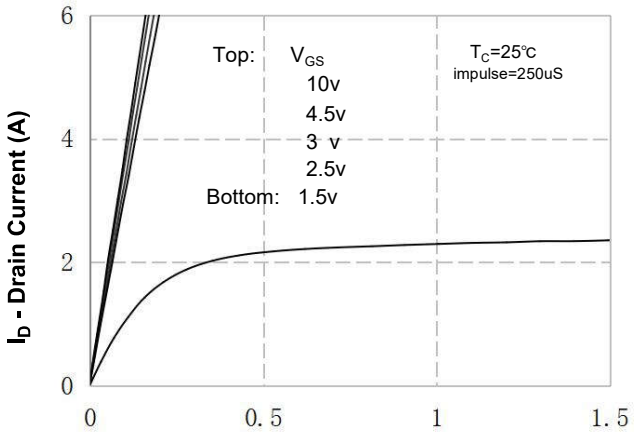
Electrical characteristics (T_A = 25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D= 250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 30V, V_{GS}= 0V			1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS}= ±12V, V_{DS}= 0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D= 250μA	0.6	0.9	1.4	V
Drain-source On-resistance [2]	$R_{DS(on)}$	V_{GS}= 10V, I_D= 5.8A		22	28	mΩ
		V_{GS}= 4.5V, I_D= 5A		23	30	
		V_{GS}= 2.5V, I_D= 4A		30	45	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 15V, V_{GS} = 0V, f = 1.0 MHz		760		pF
Output Capacitance	C_{oss}			56		
Reverse Transfer Capacitance	C_{rss}			49		
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 15 V, I_D =5.6A, V_{GS} = 4.5V		8.6		nC
Gate-source Charge	Q_{gs}			1.1		
Gate-drain Charge	Q_{gd}			2.8		
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=15V, R_G = 3 Ω ,R_L = 2.6 Ω		13		ns
Turn-on Rise Time	t_r			52		
Turn-off Delay Time	$t_{d(off)}$			25		
Turn-off Fall Time	t_f			10		
Source - Drain Diode Characteristics						
Drain to Source Diode Forward Voltage, V_{GS} = 0V, I_{SD} =5.8A,T_J = 25℃	V_{SD}			0.85	1.2	V

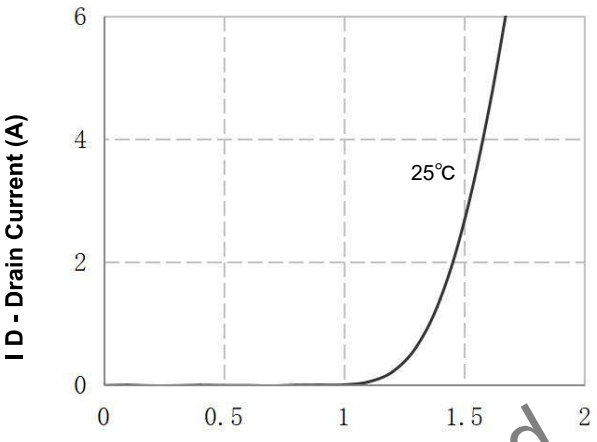
Notes:

1. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062 inch
2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

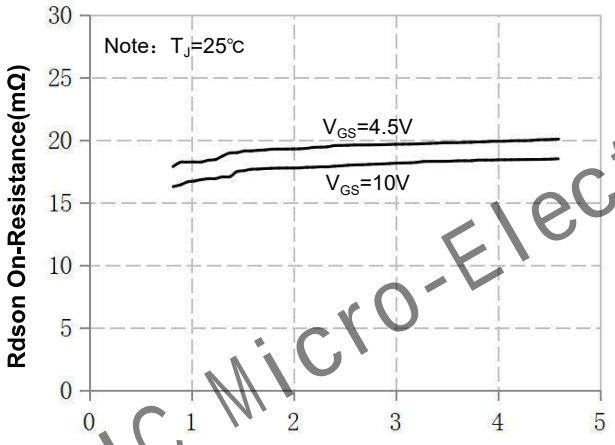
Typical characteristics (T_A = 25 °C, unless otherwise noted)



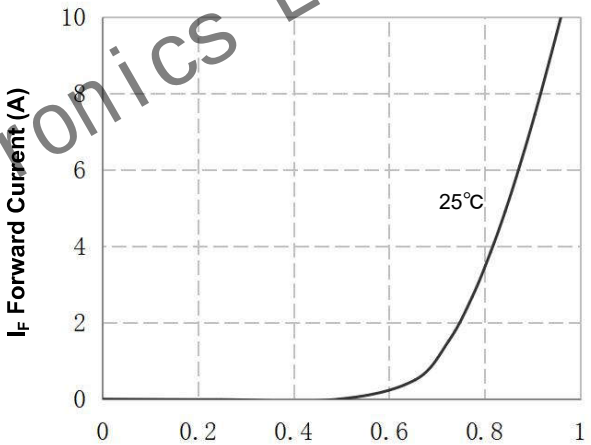
Output Characteristics



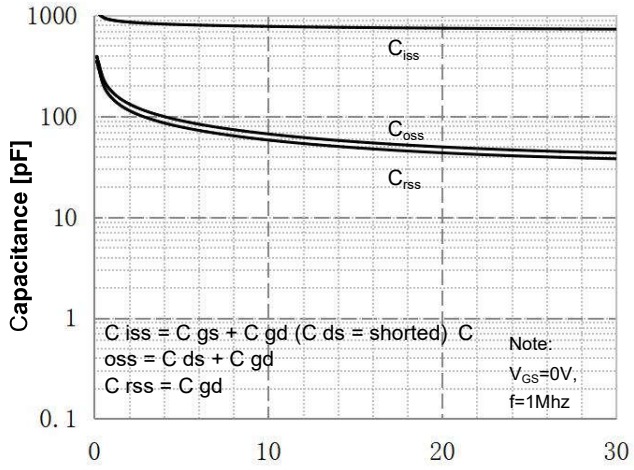
Transfer Characteristics



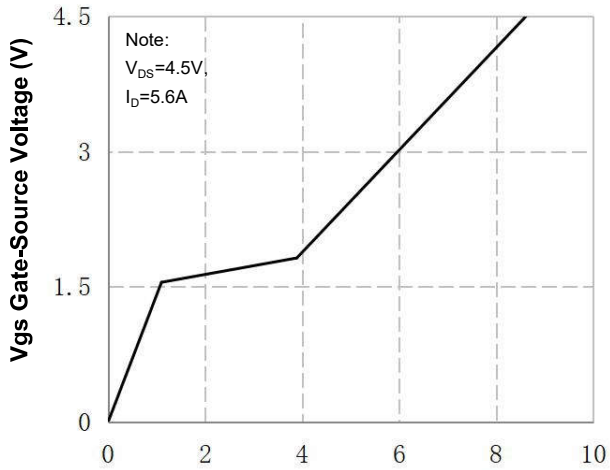
On Resistance vs. Drain Current



Body-Diode Characteristics

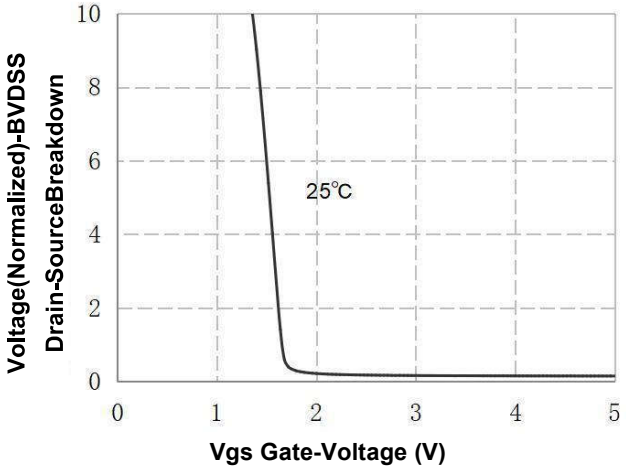


Capacitance Characteristics

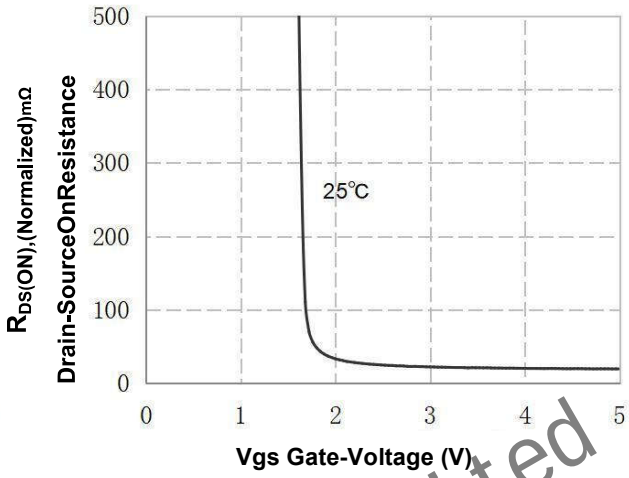


Gate Charge

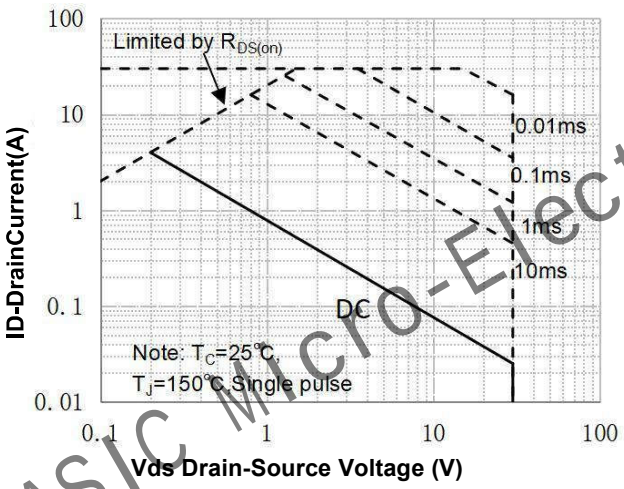
Typical characteristics (T_A = 25 °C, unless otherwise noted)



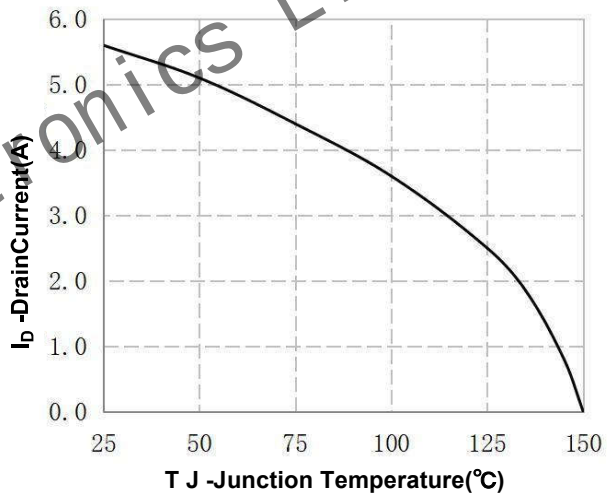
Breakdown Voltage Variation vs Gate-Voltage



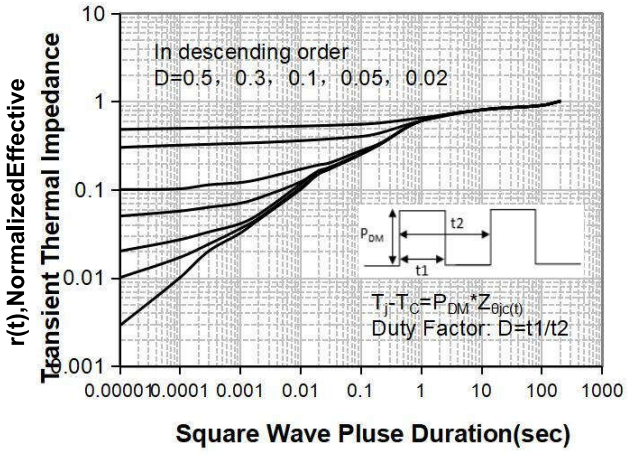
On Resistance vs. Gate-Source Bias



Maximum Safe Operating Area

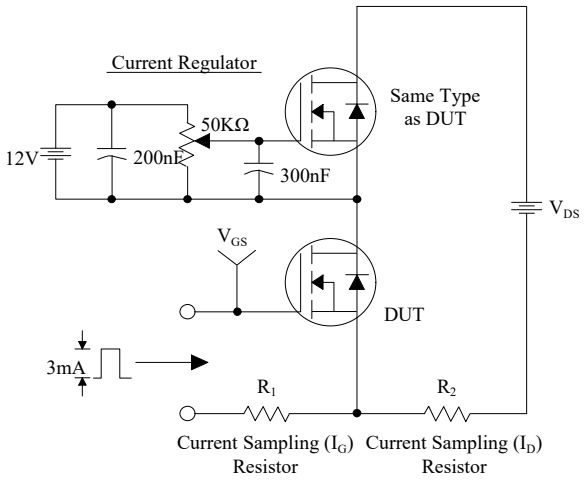


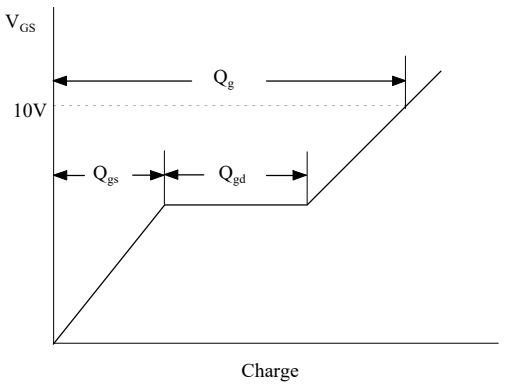
Current De-rating



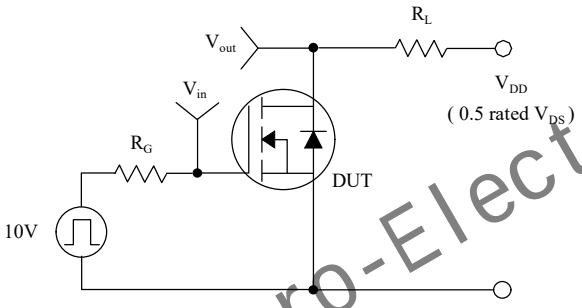
Transient Thermal Impedance, Junction-Case

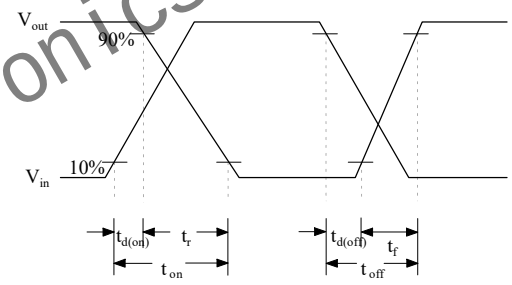
Gate Charge Test Circuit & Waveform



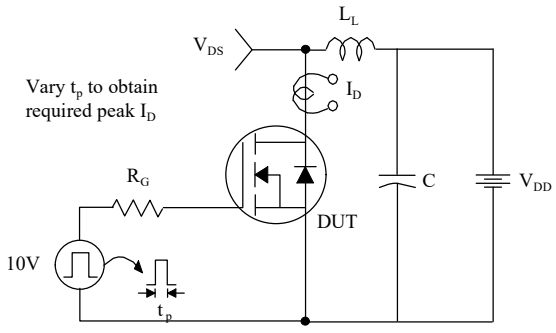


Resistive Switching Test Circuit & Waveforms

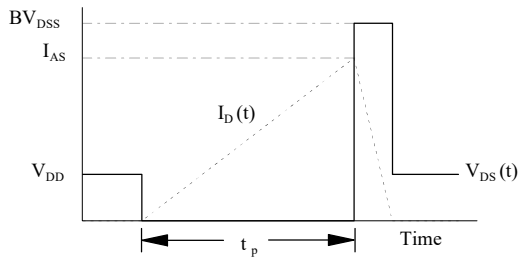




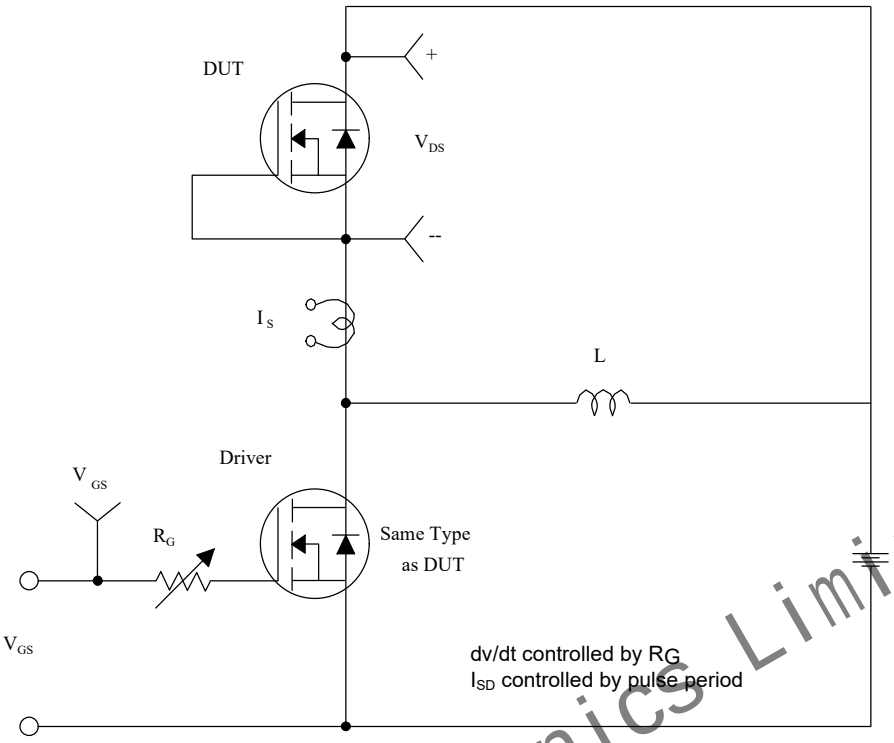
Unclamped Inductive Switching Test Circuit & Waveforms

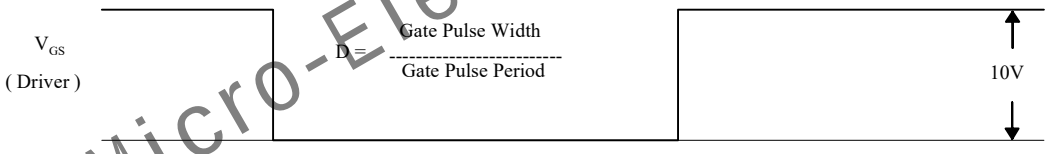


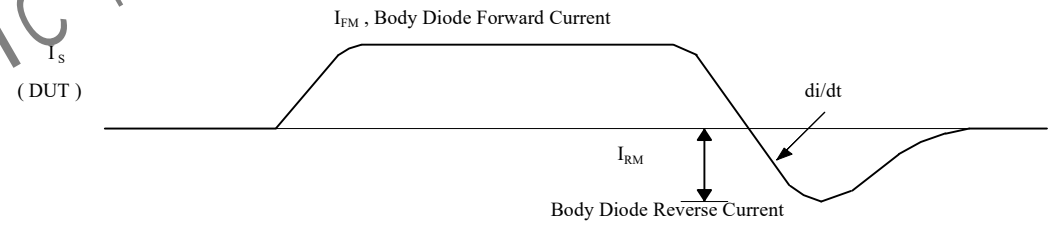
$$E_{AS} = \frac{1}{2} L_L I_{AS}^2$$

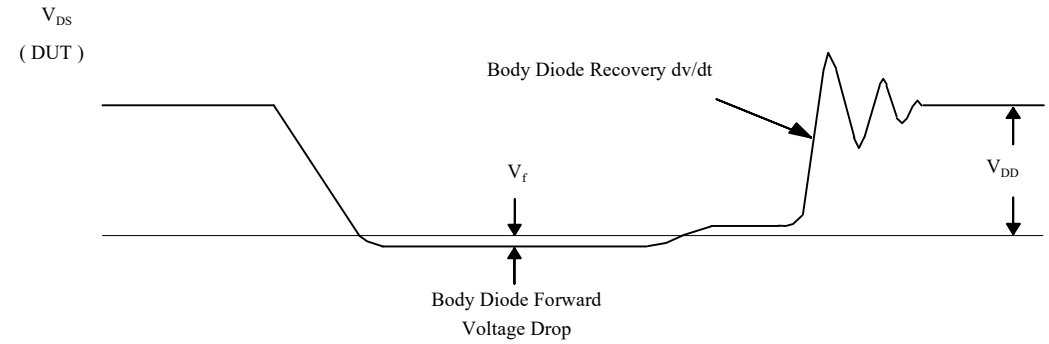


Peak Diode Recovery dv/dt Test Circuit & Waveforms



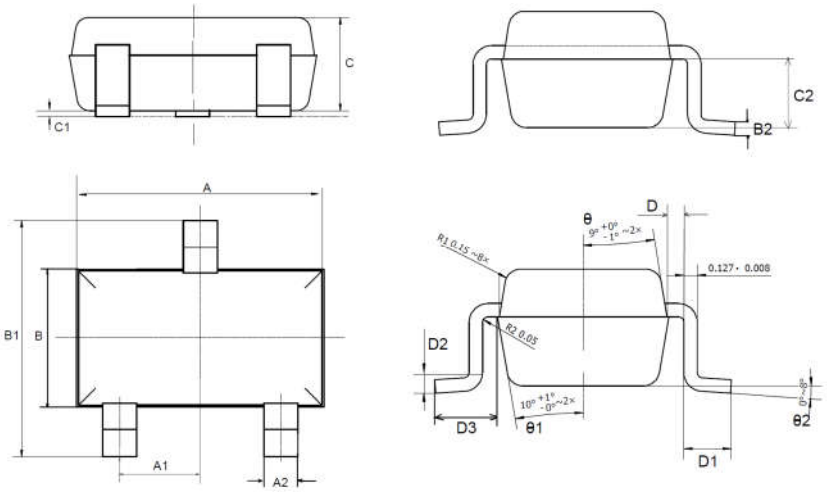






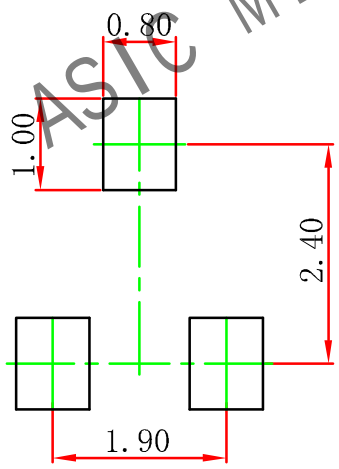
PACKAGE OUTLINE DIMENSIONS

SOT-23-3L



Symbol	Dimensions in millimeters		
	Min.	Typ.	Max.
A	2.82	2.92	3.02
A1	0.90	0.95	1.0
A2	0.35	0.4	0.45
B	1.52	1.62	1.72
B1	2.80	2.90	3.0
B2	0.12	0.128	0.135
C	1.05	1.10	1.15
C1	0.03	0.08	0.13
C2	0.6	0.65	0.7
D	0.03	0.08	0.13
D1	0.4	0.45	0.5
D2	0.25TYP		
D3	0.6	0.65	0.7

Recommended PCB Layout (Unit: mm)



Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.