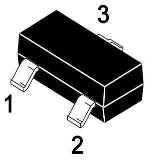
LP2305BLT1G

20V P-Channel Power MOSFET



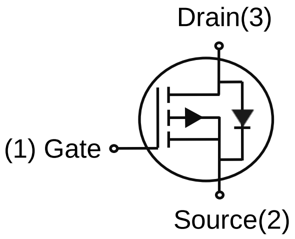
SOT23(TO-236AB)

1. FEATURES

- Low thermal impedance.
- Fast switching speed.
- We declare that the material of product compliance with RoHS requirements and Halogen Free.

2. APPLICATIONS

- Power Tools
- DC−DC conversion
- Motor Control



3. DEVICE MARKING AND RESISTOR VALUES

Device	**Marking**	**Shipping**
LP2305BLT1G	P5B	3000/Tape&Reel

4. MAXIMUM RATINGS

Parameter		**Symbol**	**Limits**	**Unit**
Drain−Source Voltage		V_{DS}	-20	V
Gate−Source Voltage		V_{GS}	± 12	V
Continuous Drain Current(V_{GS} = -4.5 V)	T_A = 25 °C	I_D	-3	A
	T_A = 100 °C		-1.9	
Pulsed Drain Current(Note 2);Single Pulse;tp ≤ 10 µs	T_A = 25 °C	I_{DM}	-12	
Avalanche Current		I_{AS}	-9	A
Avalanche Energy(L = 0.1 mH)		E_{AS}	4	mJ
Power Dissipation(Note 1)	T_A = 25 °C	P_D	0.69	W
	T_A = 100 °C		0.28	
Operating Junction and Storage Temperature		T_j,T_{stg}	-55~+150	℃

5. THERMAL CHARACTERISTICS

Parameter	**Symbol**	**Max**	**Unit**
Thermal Resistance,Junction-Ambient(Note 1)	$R_{θJA}$	180	℃/W

Note:1.Surface mounted on "1.5in x 1.5in" FR4 board using 1*1 in pad, 2 oz Cu.
2.Pulse width limited by maximum junction temperature.

6. ELECTRICAL CHARACTERISTICS(T_j = 25 ℃ unless otherwise specified)

Characteristics		Symbol	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage (V_{GS} = 0 V, I_D = -250 μA)		$V_{(BR)DSS}$	-20	-	-	V
Gate-Source Threshold Voltage (V_{DS} = V_{GS}, I_D = -250 μA)		$V_{GS(th)}$	-0.4	-0.6	-1	V
Zero Gate Voltage Drain Current (V_{DS} = -20 V, V_{GS} = 0 V)		I_{DSS}	-	-	-1	μA
Gate-Source Leakage Current (V_{DS} = 0 V, V_{GS} = ± 12 V)		I_{GSS}	-	-	±100	nA
Drain-Source On-State Resistance$^{(Note\ 3)}$ (V_{GS} = -4.5 V, I_D = -3.5 A) (V_{GS} = -2.5 V, I_D = -3 A)		$R_{DS(on)}$	- -	46 57	49 65	mΩ
Dynamic Characteristics						
Input Capacitance	(V_{DS} = -10 V, V_{GS} = 0 V, f = 1 MHz)	C_{iss}	-	420	-	pF
Output Capacitance		C_{oss}	-	64	-	
Reverse Transfer Capacitance		C_{rss}	-	56	-	
Total Gate Charge	(V_{DS} = -10 V, V_{GS} = -4.5 V,I_D = -3.5 A)	Q_g	-	5.7	-	nC
Gate-Source Charge		Q_{gs}	-	1.2	-	
Gate-Drain Charge		Q_{gd}	-	1.8	-	
Turn-On Delay Time	(V_{DS} = -10 V, I_D = - 3.5 A, V_{GS} = -4.5 V, R_G = 3 Ω)	$t_{d(on)}$	-	5.5	-	ns
Rise Time		t_r	-	8.5	-	
Turn-Off Delay Time		$t_{d(off)}$	-	37	-	
Fall Time		t_f	-	20	-	
Gate Resistance (V_{DS} = 0 V,V_{GS} = 0 V,f = 1.0 MHz)		R_G	-	15	-	Ω
Diode Characteristics						
Diode Continuous Current T_A = 25 ℃		I_S	-	-	-0.8	A
Diode Plused Current,tp ≤ 10 μs,T_A = 25 ℃		I_{SM}	-	-	-3.2	A
Diode Forward Voltage (I_S = -4.5 A,V_{GS} = 0 V)		V_{SD}	-	-0.9	-1.2	V
Reverse Recovery Time (V_R = -10 V,I_F = -3.5 A,di_F/dt = -70 A/μs)		t_{rr}	-	47	-	ns
Reverse Recovery Charge (V_R = -10 V,I_F = -3.5 A,di_F/dt = -70 A/μs)		Q_{rr}	-	17	-	nC
Reverse Recovery Current (V_R = -10 V,I_F = -3.5 A,di_F/dt = -70 A/μs)		I_{rrm}	-	-0.67	-	A

3.Pulse test: PW ⩽ 300μs,duty cycle ⩽ 2%.

7. ELECTRICAL CHARACTERISTICS CURVES

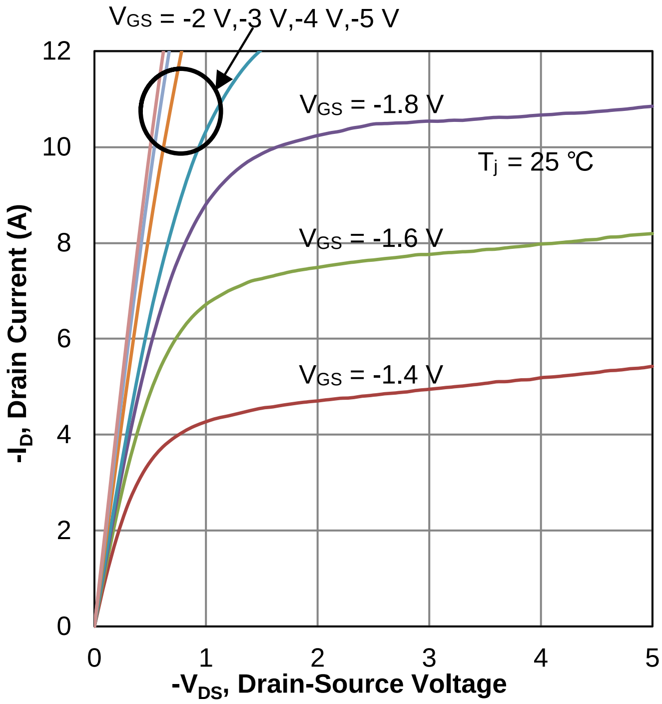


Figure 1.-I_D vs. -V_{DS}

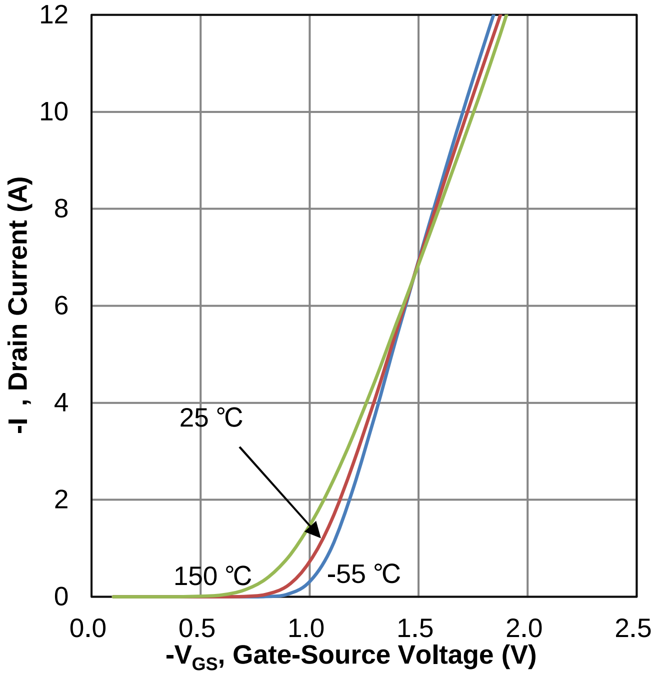


Figure 2.-I_D vs. -V_{GS}

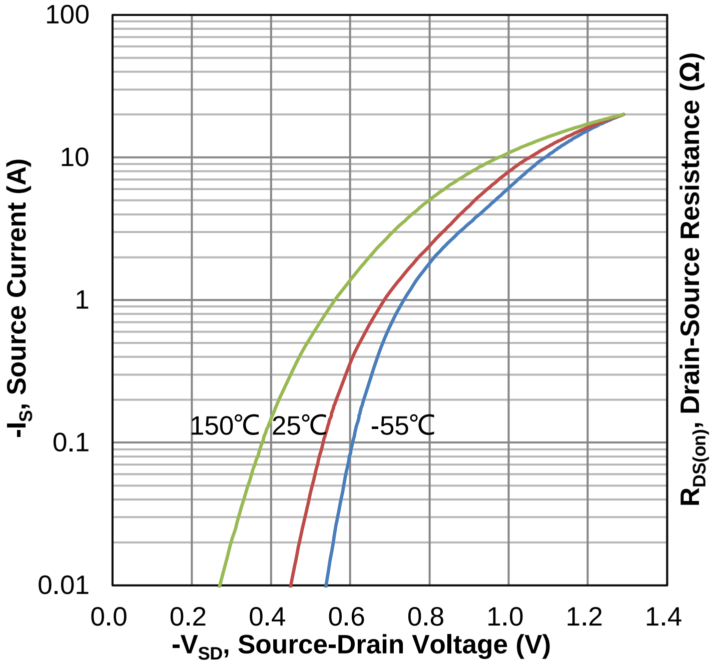


Figure 3.-I_S vs. -V_{SD}

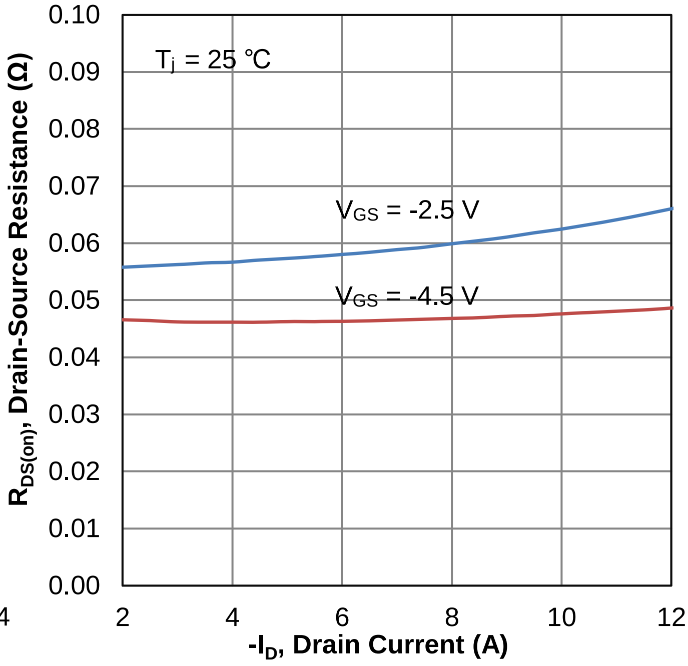


Figure 4.$R_{DS(on)}$ vs. -I_D

7. ELECTRICAL CHARACTERISTICS CURVES(Con.)

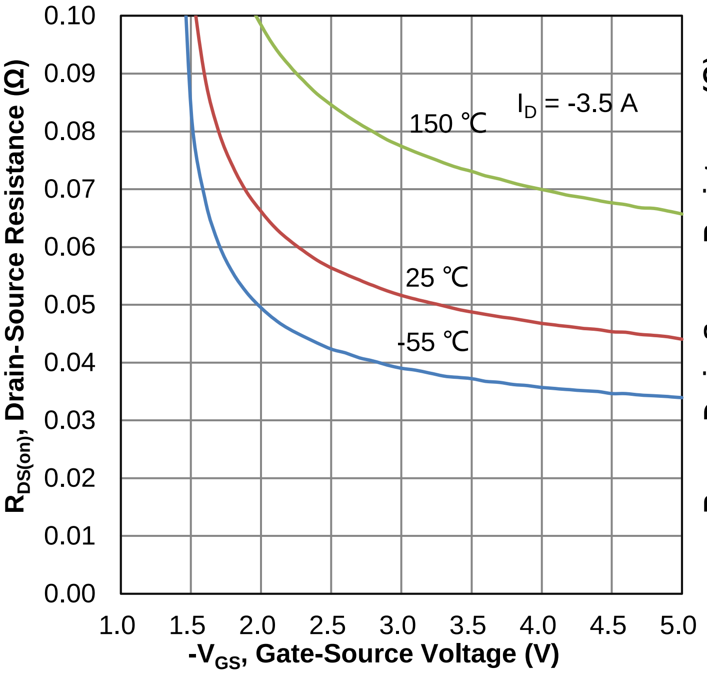


Figure 5.$R_{DS(on)}$vs. -V_{GS}

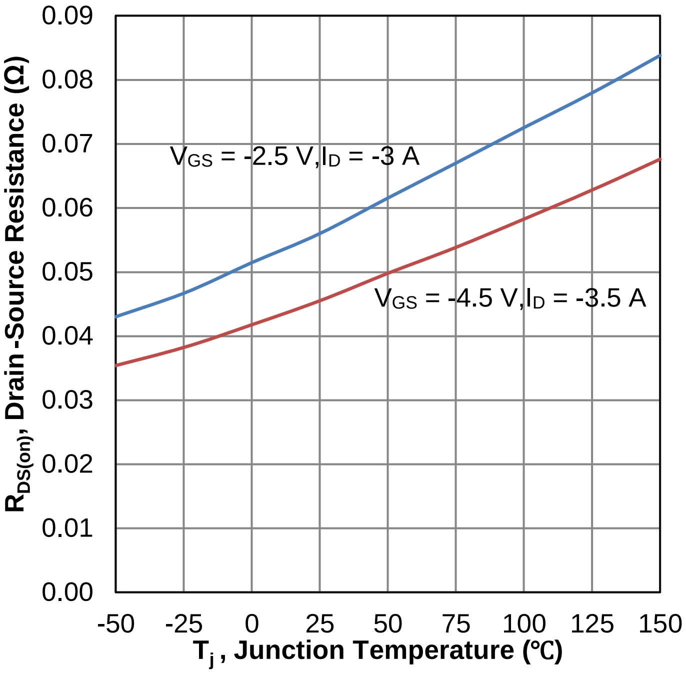


Figure 6.$R_{DS(on)}$ vs. T_j

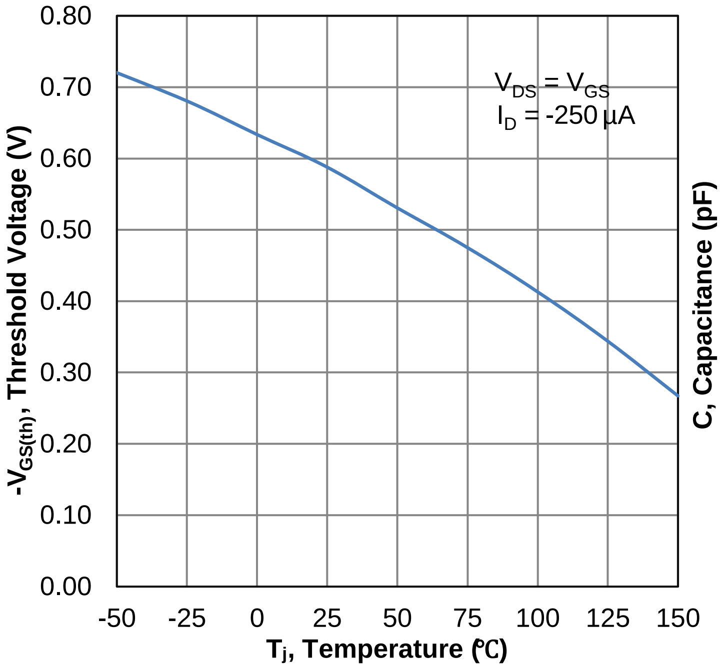


Figure 7.-$V_{GS(th)}$ vs. T_j

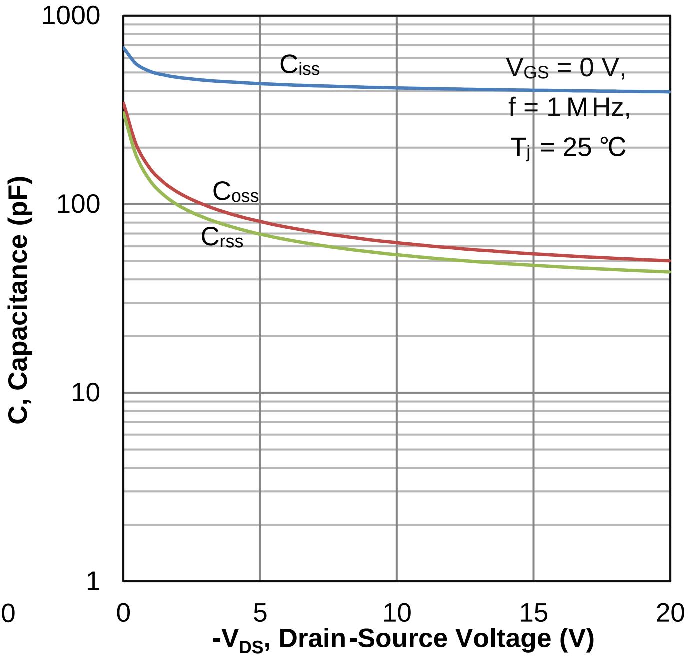


Figure 8.Capacitance

7. ELECTRICAL CHARACTERISTICS CURVES(Con.)

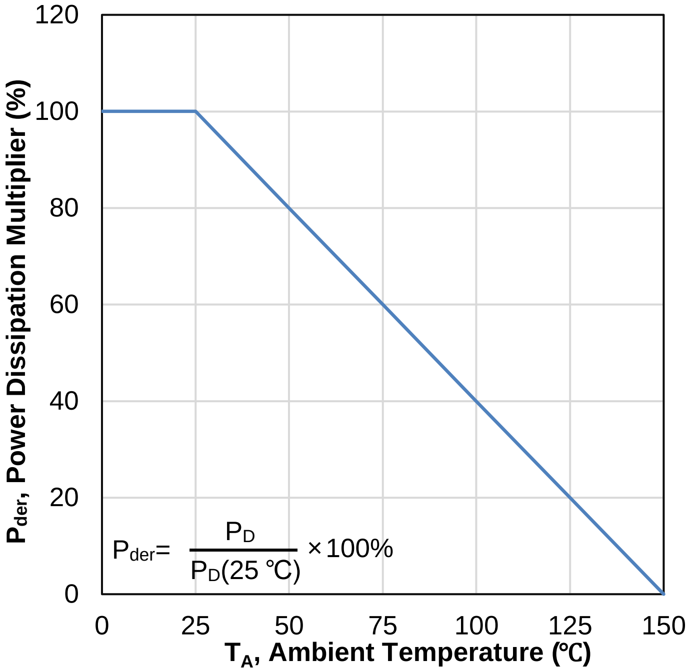


Figure 9.Normalized Derating Curve

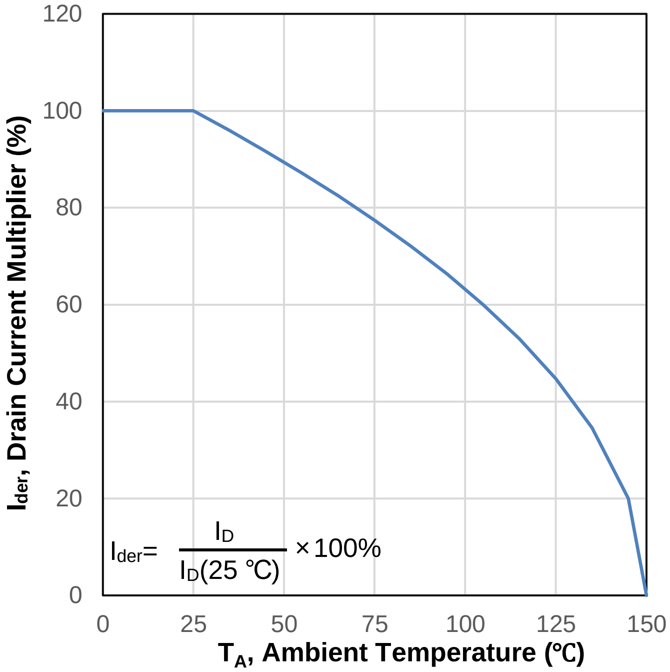


Figure 10.Normalized Drain Current

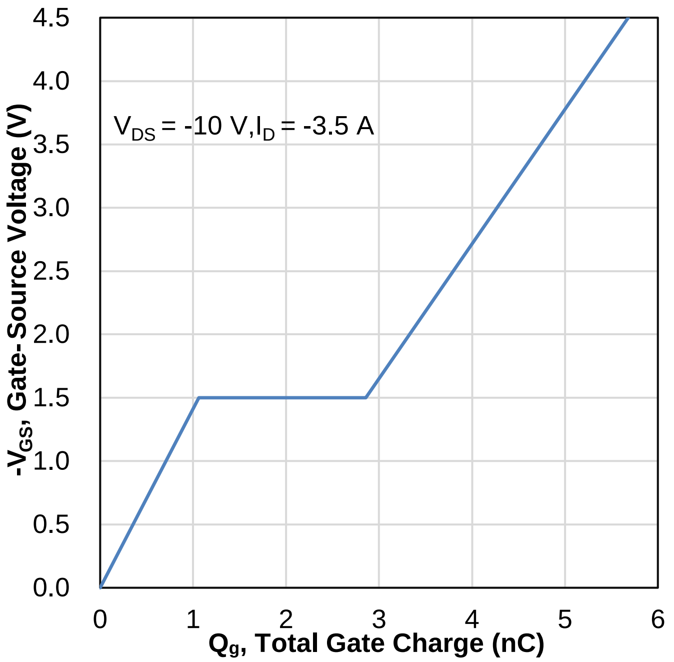


Figure 11.-V_{GS} vs. Q_g

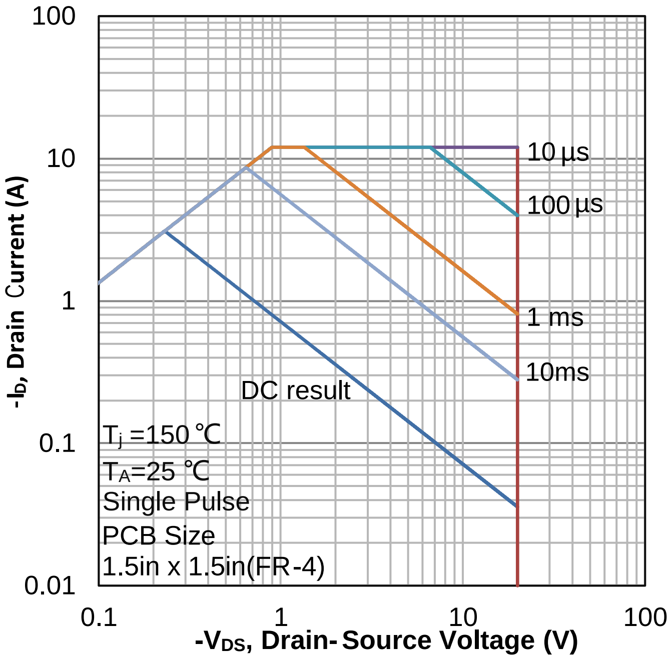


Figure 12.Safe Operating Area

7. ELECTRICAL CHARACTERISTICS CURVES(Con.)

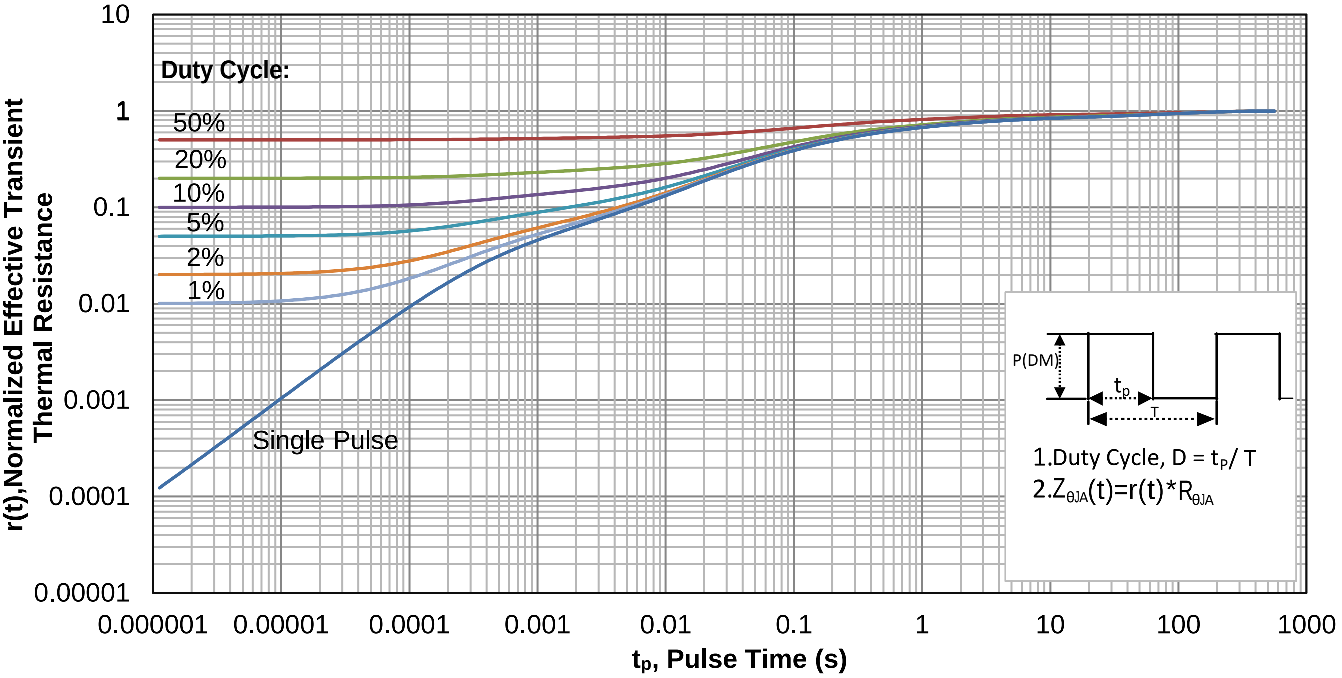
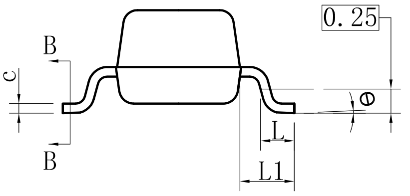
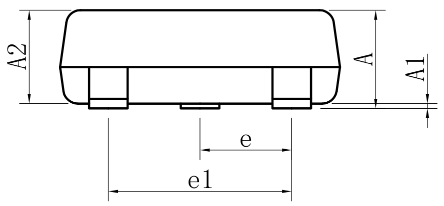


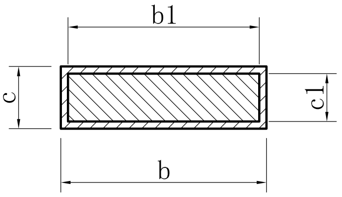
Figure 13.Thermal Response

8.OUTLINE AND DIMENSIONS

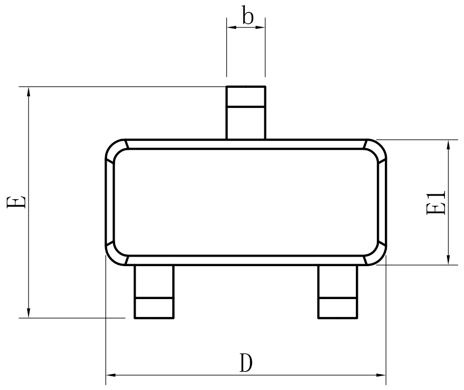




SOT23			
DIM	MIN	NOR	MAX
A	0.89	-	1.12
A1	0.01	-	0.10
A2	0.88	0.95	1.02
b	0.30	-	0.50
b1	0.30	0.40	0.45
c	0.08	-	0.20
c1	0.08	0.10	0.16
D	2.80	2.90	3.04
E	2.10	-	2.64
E1	1.20	1.30	1.40
e	0.95BSC		
e1	1.90BSC		
L	0.40	0.46	0.60
L1	0.54REF		
θ	0°	-	8°
All Dimensions in mm			



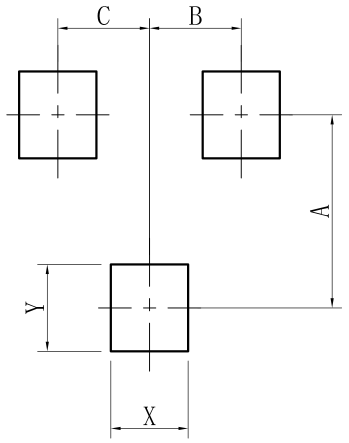
SECTION B-B



GENERAL NOTES

1. Top package surface finish Ra0.4±0.2um
2. Bottom package surface finish Ra0.7±0.2um
3. Side package surface finish Ra0.4±0.2um

9.SOLDERING FOOTPRINT



SOT23	
DIM	(mm)
X	0.80
Y	0.90
A	2.00
B	0.95
C	0.95

DISCLAIMER

- Curve guarantee in the specification. The curve of test items with electric parameter is used as quality guarantee. The curve of test items without electric parameter is used as reference only.

- Before you use our Products for new Porject, you are requested to carefully read this document and fully understand its contents. LRC shall not be in any way responsible or liable for failure, malfunction or accident arising from the use of any LRC’s Products against warning, caution or note contained in this document.

- All information contained in this document is current as of the issuing date and subject to change without any prior notice. Before purchasing or using LRC's Products,please confirm the latest information with a LRC sales representative.