

N-Channel Enhancement Mode Power MOSFET

Description

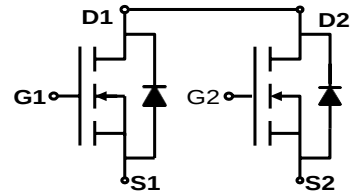
The BLM8205B uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

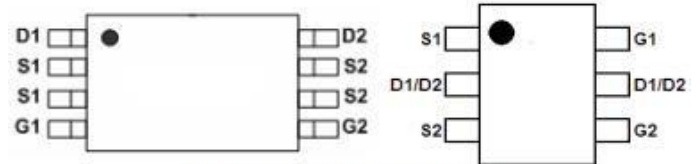
- $V_{DS} = 20V, I_D = 6.5A$
 $R_{DS(ON)} < 29m\Omega @ V_{GS}=2.5V$
 $R_{DS(ON)} < 25m\Omega @ V_{GS}=4.5V$
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- Battery protection
- Load switch
- Power management



Schematic diagram



Marking and pin assignment



Top view

Package Marking And Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
8205B	BLM8205B	SOT23-6	Ø180mm	8mm	3000 units
8205B	BLM8205B	TSSOP-8	Ø180mm	12mm	3000 units

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	6.5	A
Drain Current-Pulsed (Note 1)	I_{DM}	25	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	83	°C/W
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Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V

Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =19.5V,V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V,V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA	0.5	0.7	1.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =5A	-	18	25	mΩ
		V _{GS} =2.5V, I _D =5A	-	23	29	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V,I _D =5A	-	10	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{ISS}	V _{DS} =10V,V _{GS} =0V, F=1.0MHz	-	565	-	PF
Output Capacitance	C _{OSS}		-	108	-	PF
Reverse Transfer Capacitance	C _{RSS}		-	98	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V,I _D =5A V _{GS} =4V,R _{GEN} =10Ω	-	9	-	nS
Turn-on Rise Time	t _r		-	10	-	nS
Turn-Off Delay Time	t _{d(off)}		-	32	-	nS
Turn-Off Fall Time	t _f		-	24	-	nS
Total Gate Charge	Q _g	V _{DS} =10V,I _D =5A, V _{GS} =4.5V	-	9.5	-	nC
Gate-Source Charge	Q _{gs}		-	1.2	-	nC
Gate-Drain Charge	Q _{gd}		-	3.3	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V,I _S =6A	-	0.8	1.2	V
Diode Forward Current (Note 2)	I _S		-	-	6.5	A

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, not subject to production

Typical Electrical and Thermal Characteristics

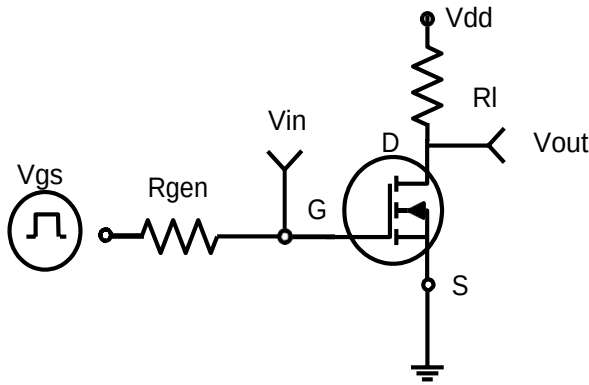


Figure 1: Switching Test Circuit

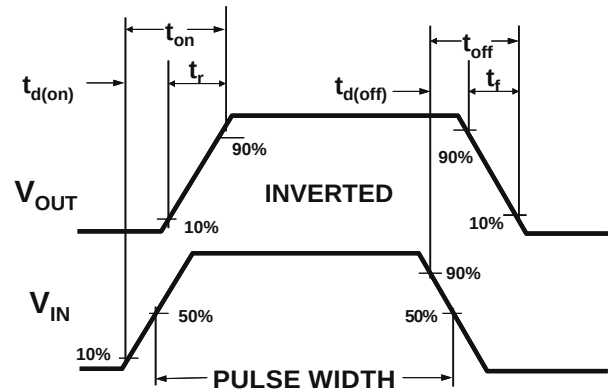


Figure 2: Switching Waveforms

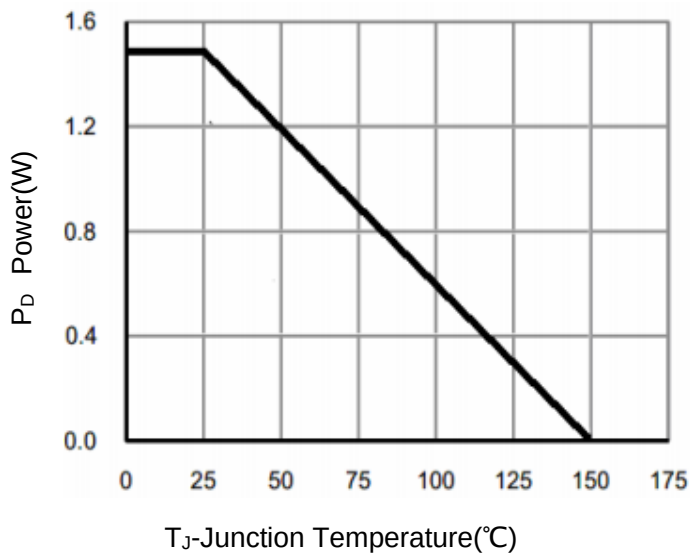


Figure 3 Power Dissipation

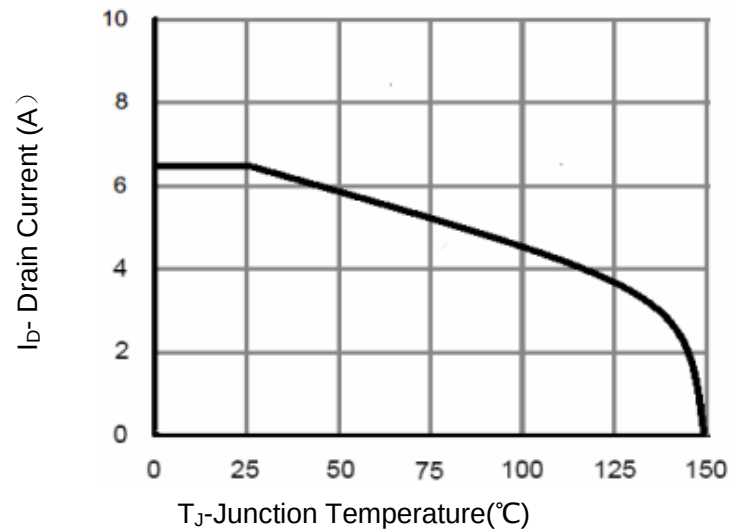


Figure 4 Drain Current

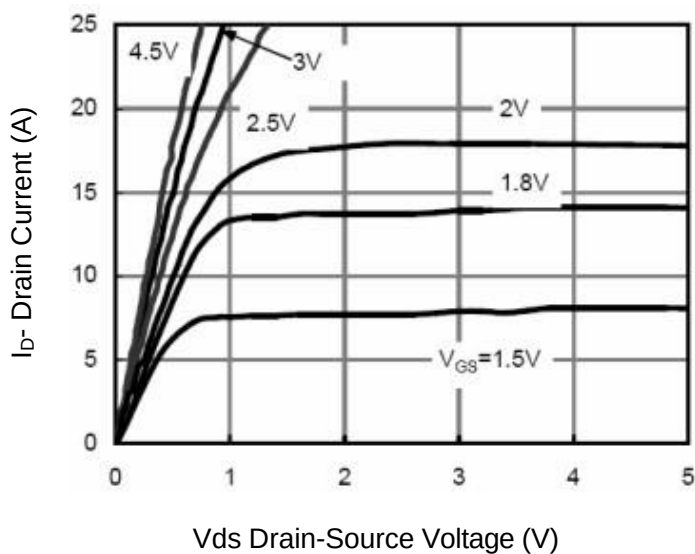


Figure 5 Output Characteristics

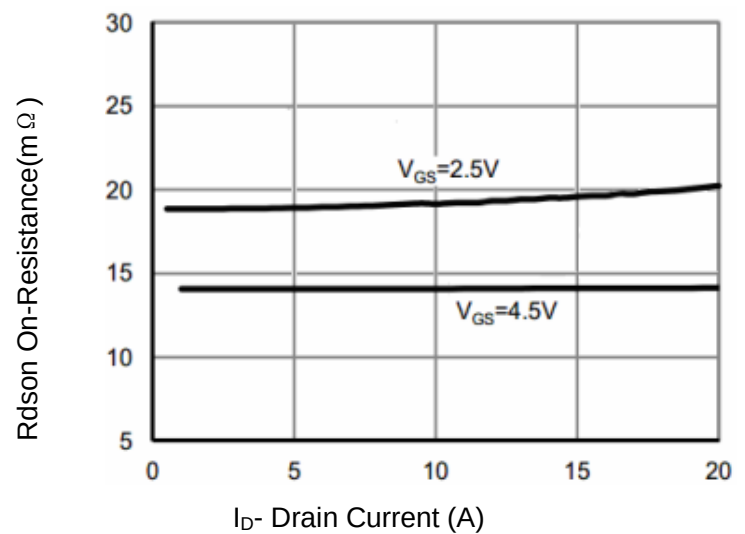
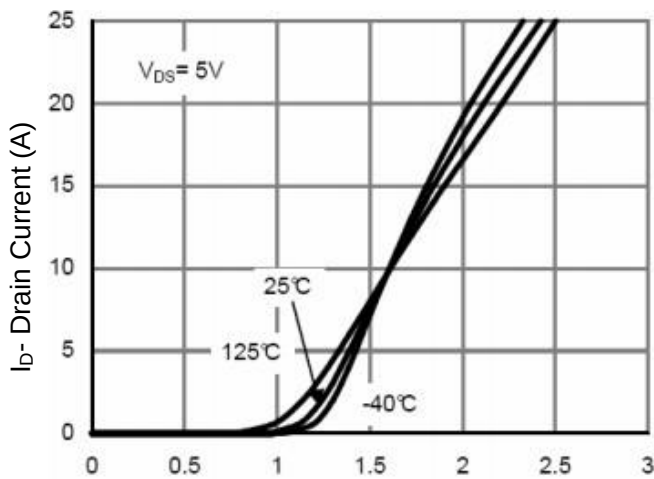
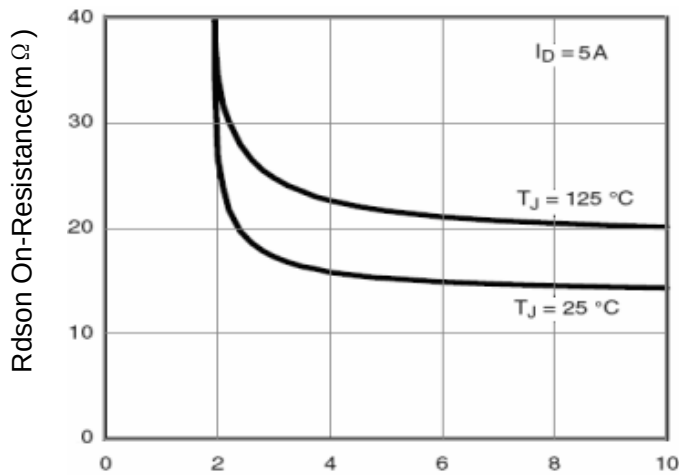


Figure 6 Drain-Source On-Resistance



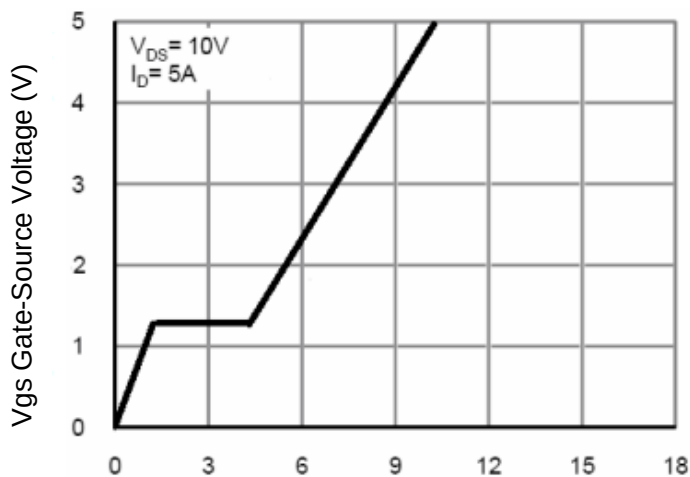
V_{GS} Gate-Source Voltage (V)

Figure 7 Transfer Characteristics



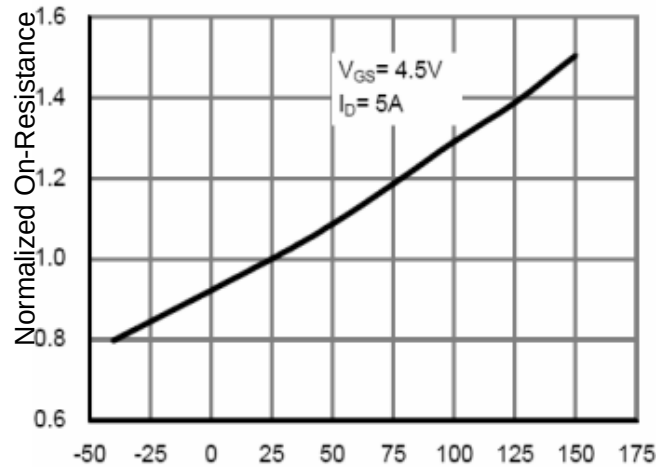
V_{GS} Gate-Source Voltage (V)

Figure 9 Rdson vs Vgs



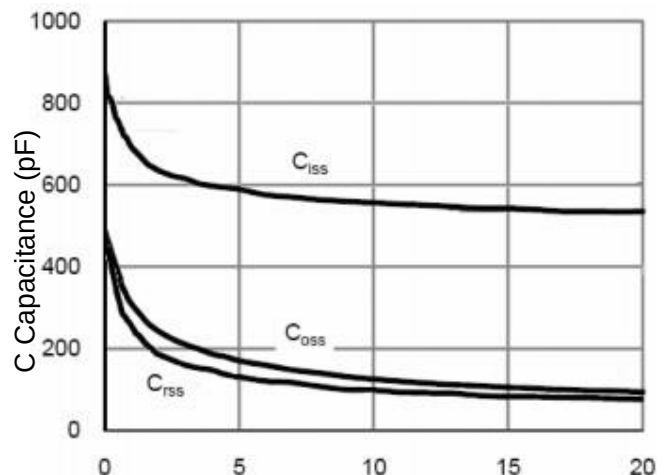
Q_g Gate Charge (nC)

Figure 11 Gate Charge



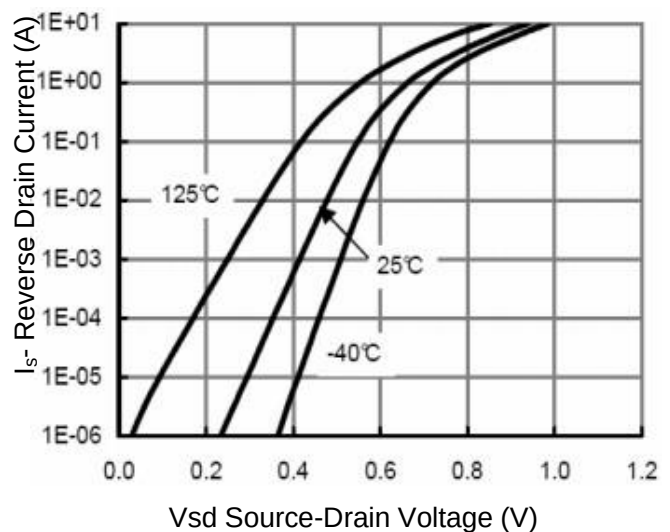
T_J Junction Temperature(°C)

Figure 8 Drain-Source On-Resistance



V_{DS} Drain-Source Voltage (V)

Figure 10 Capacitance vs Vds



V_{SD} Source-Drain Voltage (V)

Figure 12 Source- Drain Diode Forward

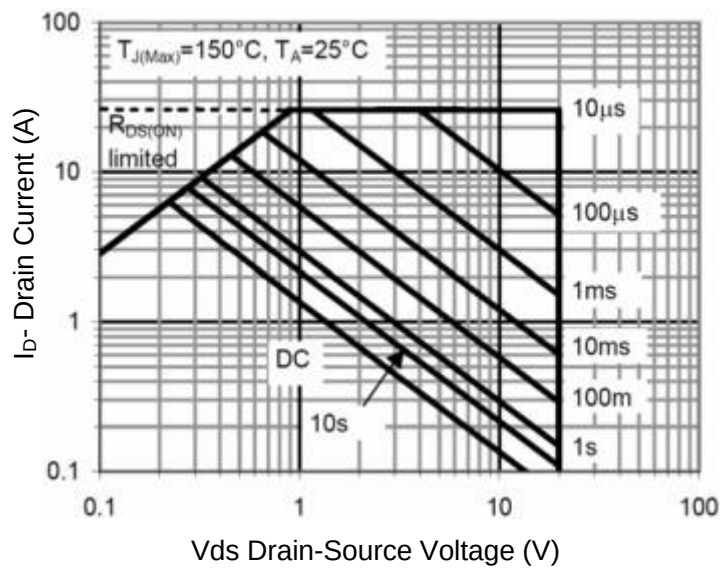


Figure 13 Safe Operation Area

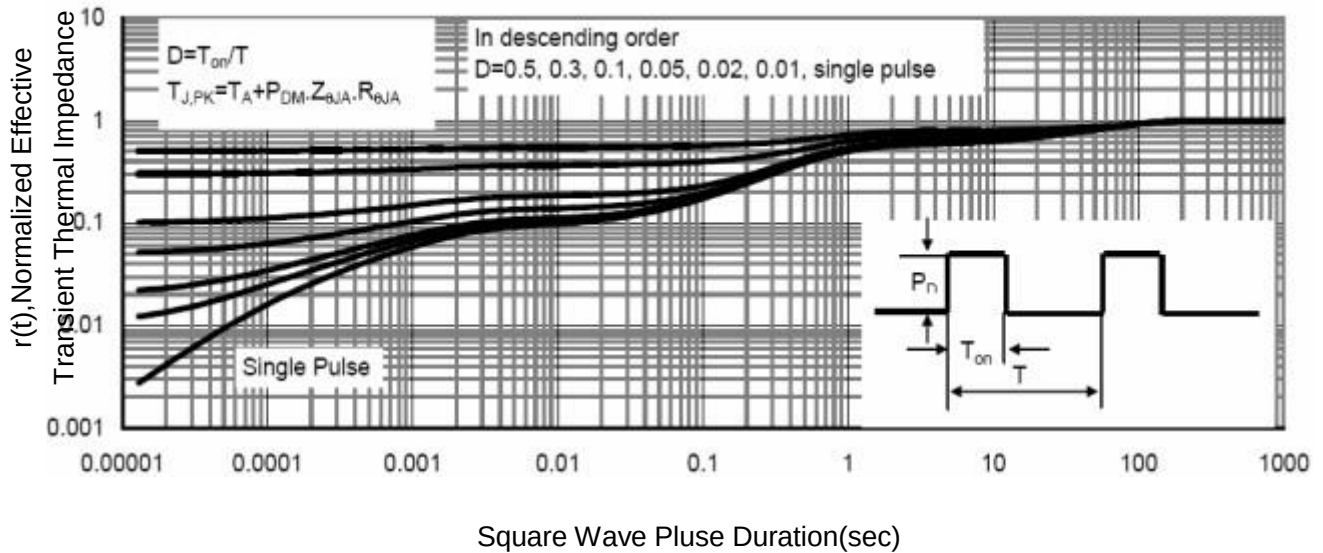
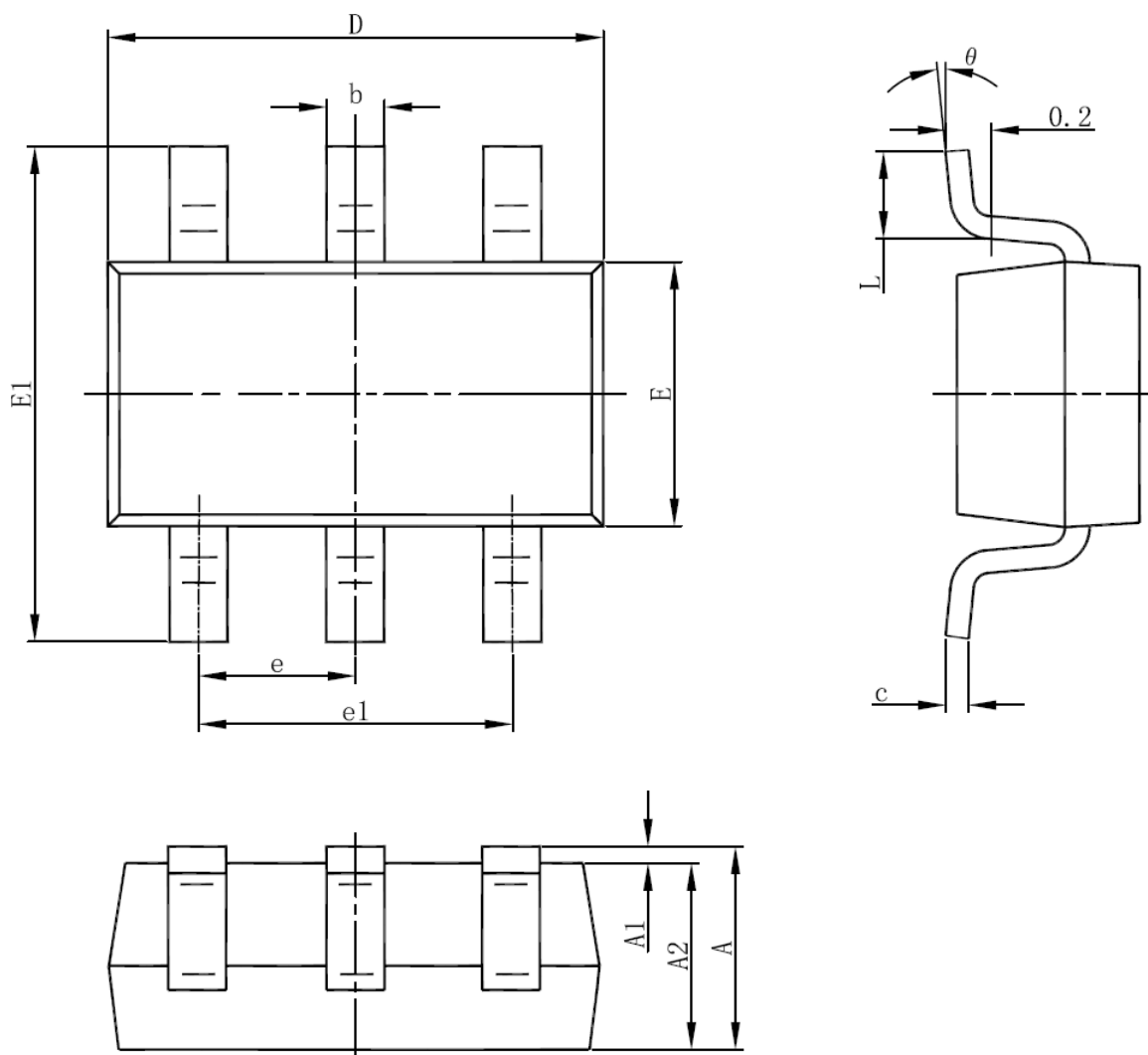
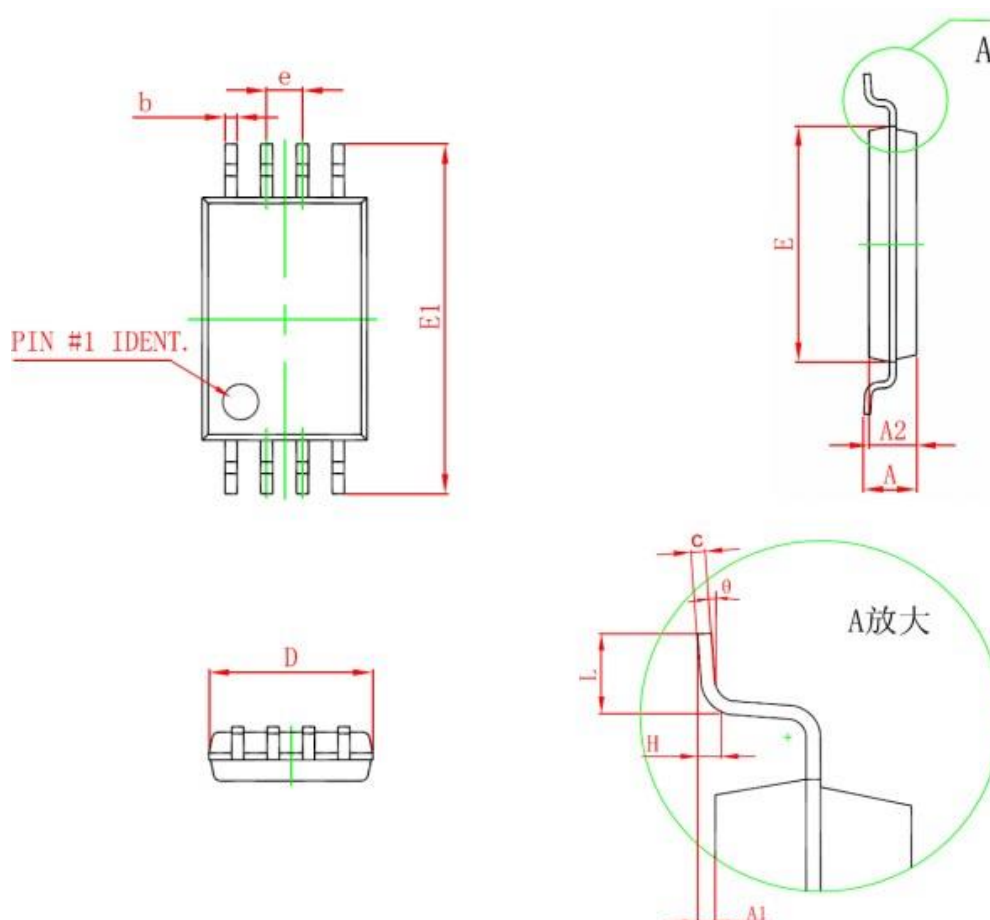


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT23-6L Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

TSSOP-8 PACKAGE IN FORMATION



Symbol	Dimensions In Millimeters	
	Min	Max
D	2.900	3.100
E	4.300	4.500
b	0.190	0.300
c	0.090	0.200
E1	6.250	6.550
A		1.100
A2	0.800	1.000
A1	0.020	0.150
e	0.65(BSC)	
L	0.500	0.700
H	0.25(TYP)	
θ	1°	7°