Features

- Super Low Gate Charge
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

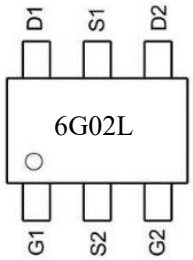
Bvdss	Rdson	ID
20V	17mΩ	6.3A
-20V	30mΩ	-4.1A

RoHS

Application

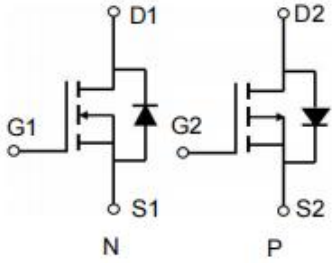
- Power management in half bridge and inverters
- Load Switch
- DC-DC Converter

Package



Marking and pin assignment

SOT23-6L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
6G02L	6G02L	SOT23-6L	3000

Absolute Maximum Ratings

Parameter	Symbol	Value		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	±12	±12	V
Continuous Drain Current,V_{GS} @ 10V[1]	I_D@T_C=25℃	6.3	-4.1	A
	I_D@T_C =100℃	4	-2.6	A
Pulsed Drain Current[2]	I_{DM}	15	-16	A
Single Pulsed Avalanche Energy[3]	EAS	72	59	mJ
Avalanche Current	I_{AS}	21	-19	A
Total Power Dissipation[4]	P_D@T_C=25℃	1	1	W
Operating Junction Temperature Range	T_J	-55 ~ 150		℃
Storage Temperature Range	T_{STG}	-55 ~ 150		℃

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	70	℃/W
Thermal Resistance Junction-Ambient[1]	$R_{\theta JA}$	125	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL6G02L	SOT23-6L	1,3	4,6	2,5	Tape Reel

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250uA	20	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=16V,V_{GS}=0V, T_J=25℃	-	-	1	uA
		V_{DS}=16V,V_{GS}=0V, T_J=55℃	-	-	5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS},I_D=250uA	0.4	-	1.2	V
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=4.5V,I_D=3A	-	17	25	mΩ
		V_{GS}=2.5V,I_D=2A	-	21	30	
Forward Transconductance	gfs	V_{DS}=5V,I_D=3A	-	10.5	-	S
Total Gate Charge (4.5V)	Q_g	V_{DS}=15V,V_{GS}=4.5V,I_D=3A	-	4.6	-	nC
Gate-Source Charge	Q_{gs}		-	0.7	-	
Gate-Drain Charge	Q_{gd}		-	1.5	-	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=10V,V_{GS}=4.5V, R_G=3.3Ω , I_D=3A	-	16	-	ns
Rise Time	T_r		-	42	-	
Turn-Off Delay Time	$T_{d(off)}$		-	14	-	
Fall Time	T_f		-	7	-	
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V,f=1MHz	-	310	-	pF
Output Capacitance	C_{oss}		-	49	-	
Reverse Transfer Capacitance	C_{rss}		-	35	-	
Continuous Source Current[1,4]	I_S	V_G=V_D=0V, Force Current	-	-	6	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V, I_S=1A,T_J=25℃	-	-	1.2	V

Notes:

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width≦300us,duty cycle≦2%.

3.The power dissipation is limited by 150℃ junction temperature.

4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250uA	-20	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V, T_J=25℃	-	-	-1	uA
		V_{DS}=-20V,V_{GS}=0V, T_J=55℃	-	-	-5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS},I_D=-250uA	-0.4	-0.7	-1	V
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=-4.5V,I_D=-4.1A	-	30	38	mΩ
		V_{GS}=-2.5V,I_D=-3A	-	38	53	
Total Gate Charge (4.5V)	Q_g	V_{DS}=-10V,V_{GS}=-4.5V,I_D=-2A	-	8.8	-	nC
Gate-Source Charge	Q_{gs}		-	1.4	-	
Gate-Drain Charge	Q_{gd}		-	1.9	-	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-10V,V_{GS}=-4.5V, R_G=1Ω , I_D=-3.3A	-	10	-	ns
Rise Time	T_r		-	32	-	
Turn-Off Delay Time	$T_{d(off)}$		-	50	-	
Fall Time	T_f		-	51	-	
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V,f=1MHz	-	830	-	pF
Output Capacitance	C_{oss}		-	132	-	
Reverse Transfer Capacitance	C_{rss}		-	85	-	
Continuous Source Current[1,4]	I_S	V_G=V_D=0V, Force Current	-	-	-4.1	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V, I_S=-4.1A,T_J=25℃	-	-	-1.2	V

Notes:

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width≦300us , duty cycle≦2%.

3.The power dissipation is limited by 150℃ junction temperature.

4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

N-Channel Typical Characteristics

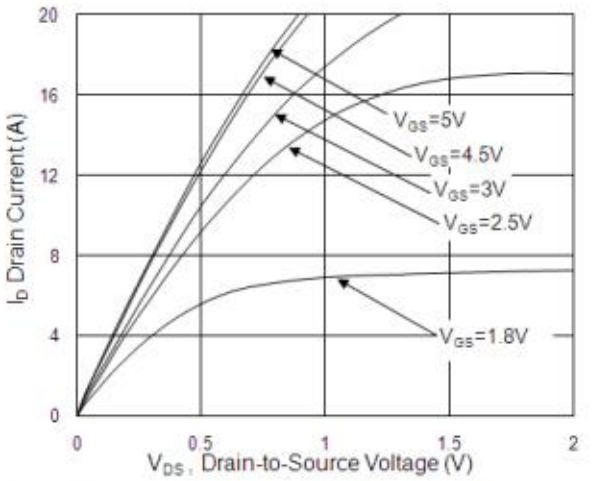


Fig.1 Typical Output Characteristics

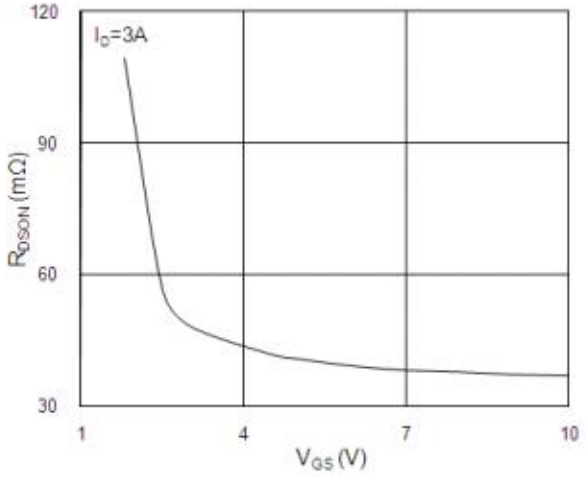


Fig.2 On-Resistance vs. Gate-Source Voltage

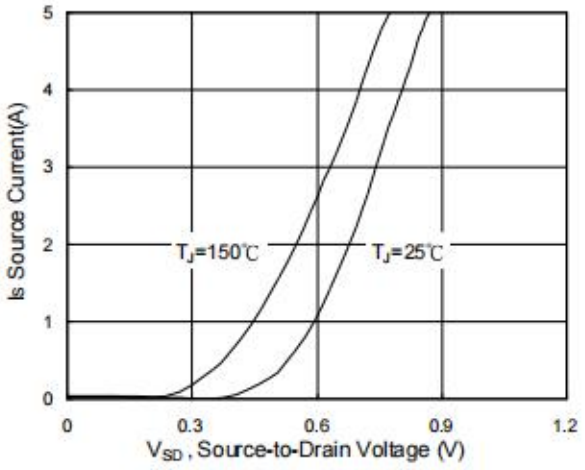


Fig.3 Forward Characteristics of Reverse

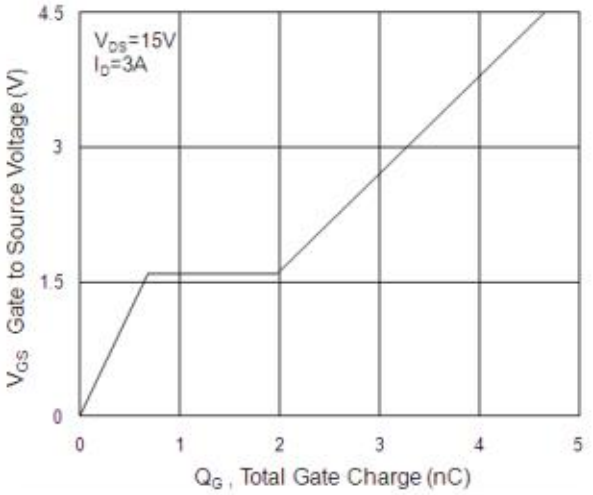


Fig.4 Gate-Charge Characteristics

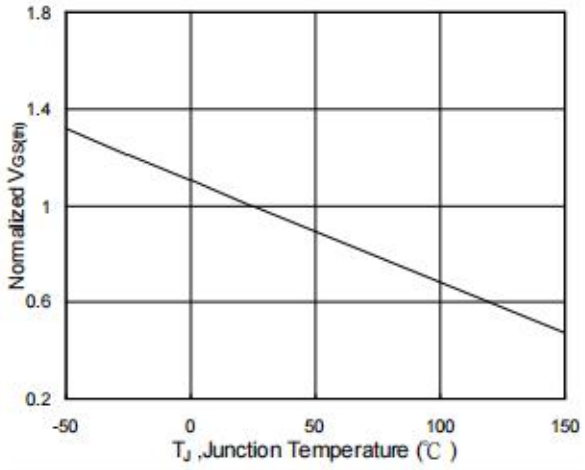


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

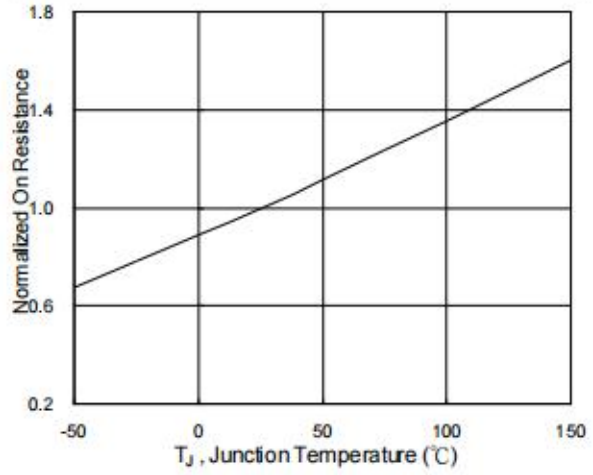


Fig.6 Normalized R_{DSON} vs. T_J

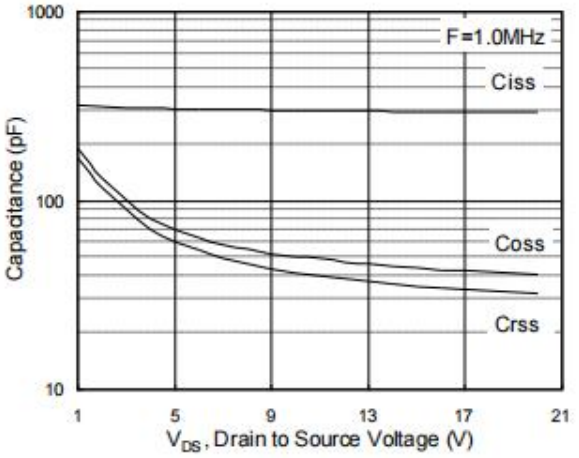


Fig.7 Capacitance

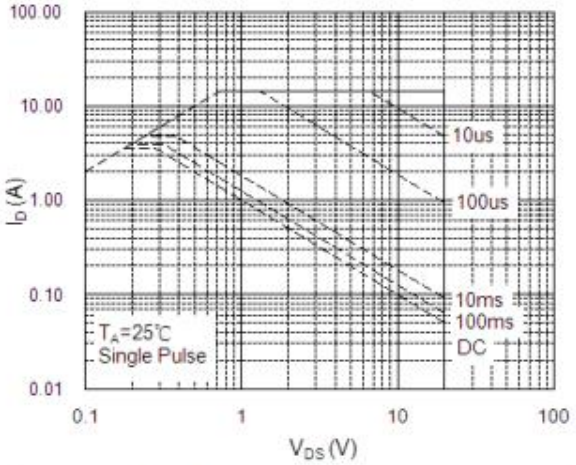


Fig.8 Safe Operating Area

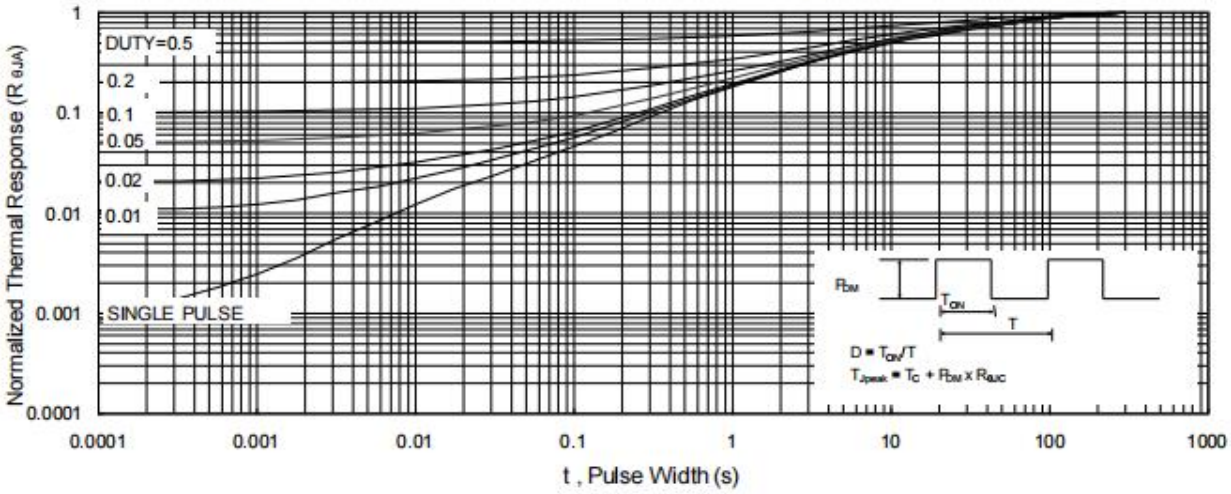


Fig.9 Normalized Maximum Transient Thermal Impedance

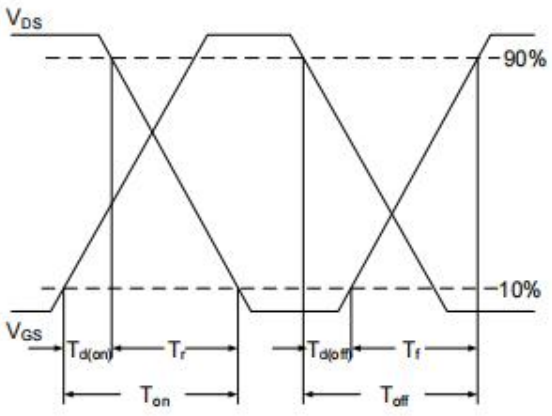


Fig.10 Switching Time Waveform

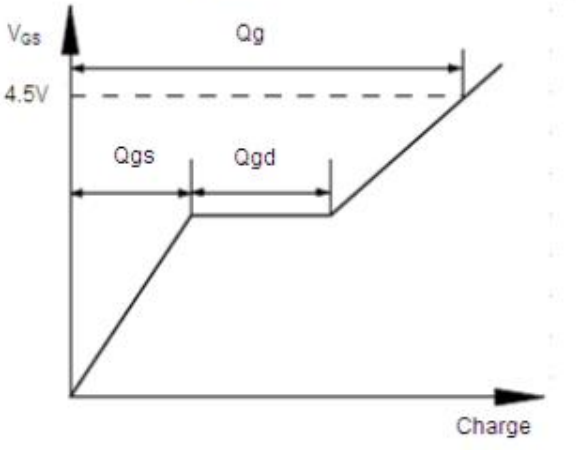


Fig.11 Gate Charge Waveform

P-Channel Typical Characteristics

Q-

Figure1: Output Characteristics

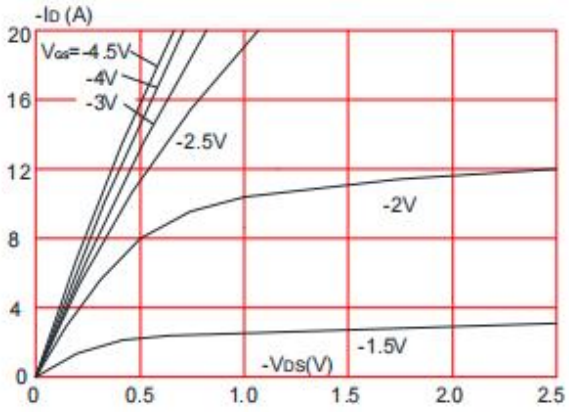


Figure 2: Typical Transfer Characteristics

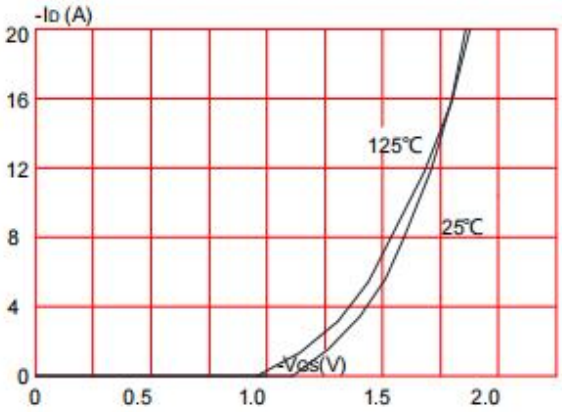


Figure 3: On-resistance vs. Drain Current

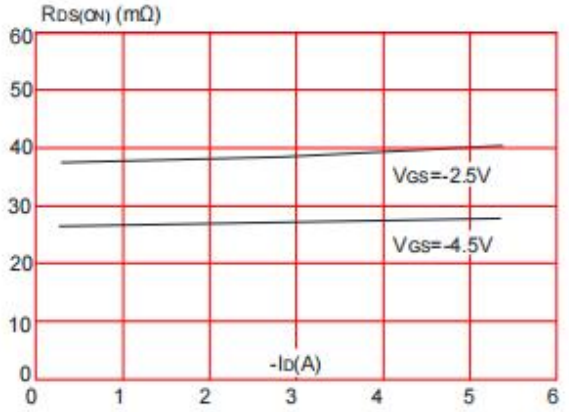


Figure 4: Body Diode Characteristics

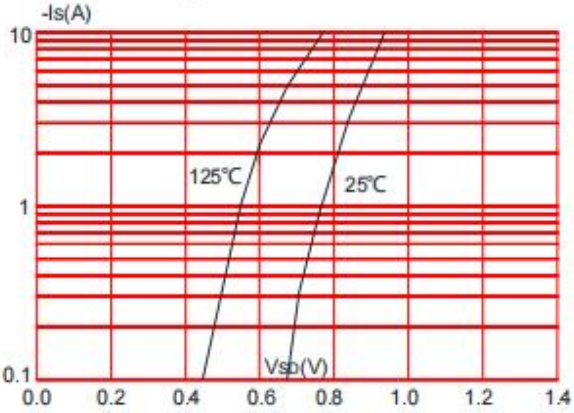


Figure 5: Gate Charge Characteristics

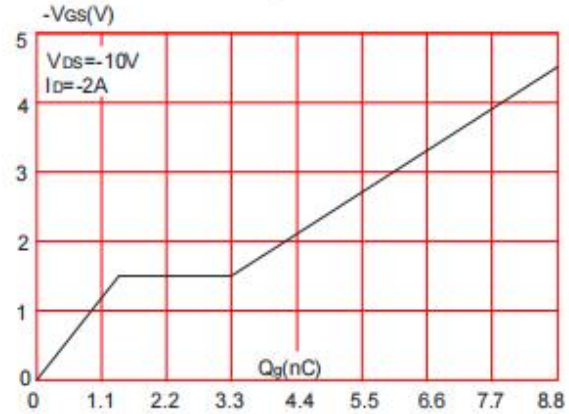


Figure 6: Capacitance Characteristics

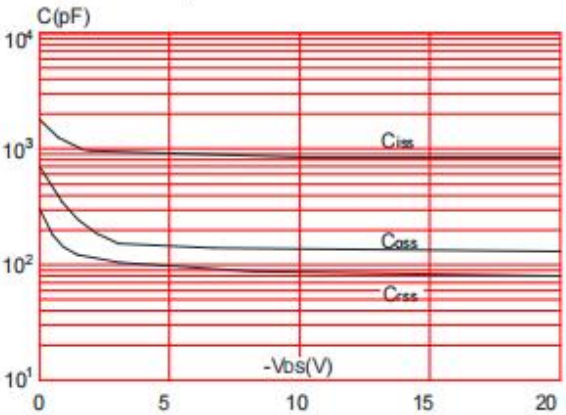


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

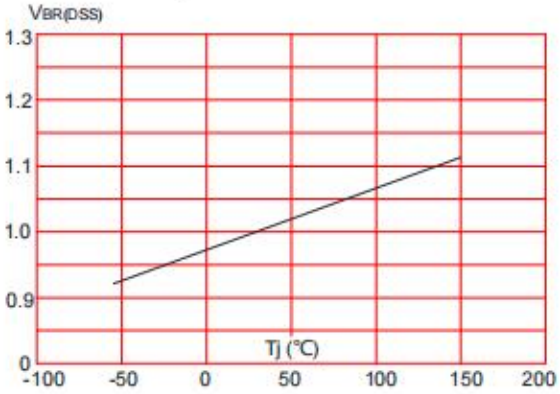


Figure 8: Normalized on Resistance vs. Junction Temperature

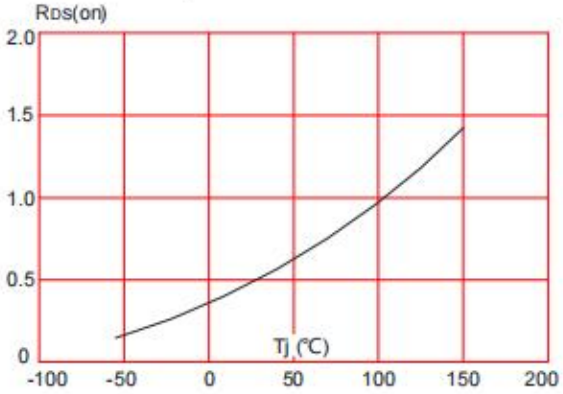


Figure 9: Maximum Safe Operating Area

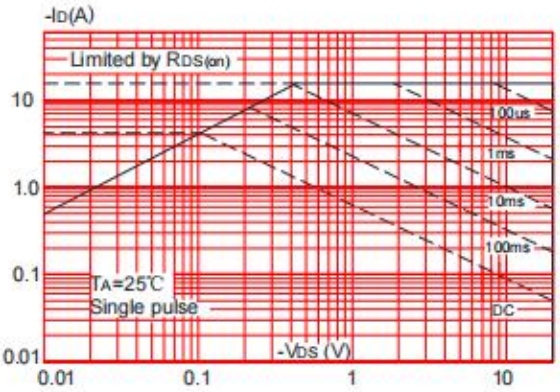


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

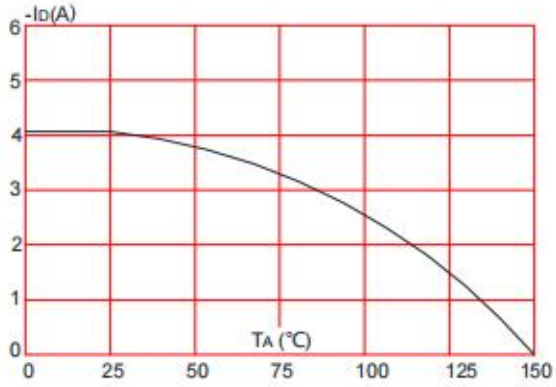
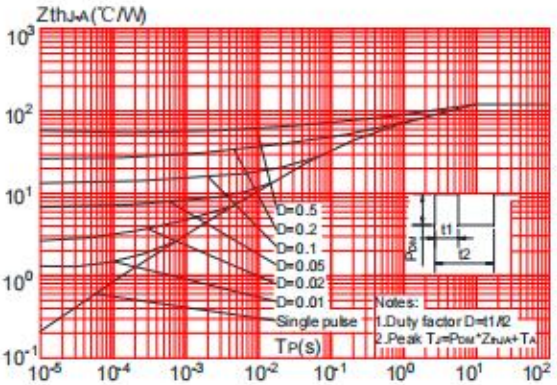
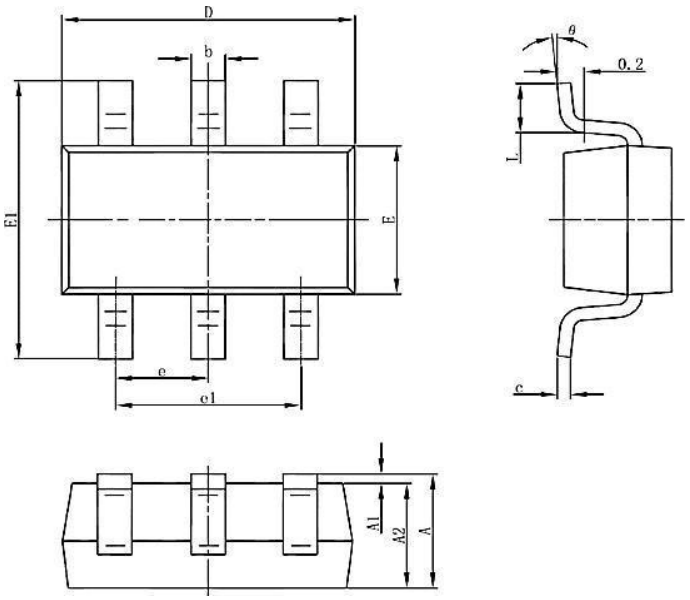


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Package Dimensions SOT23-6L



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

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