

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D	$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
20V	25mΩ@4.5V	5.6A	-20V	64mΩ@-4.5V	-3.7A
	32mΩ@2.5V			80mΩ@-2.5V	
	49mΩ@1.8V			110mΩ@-1.8V	

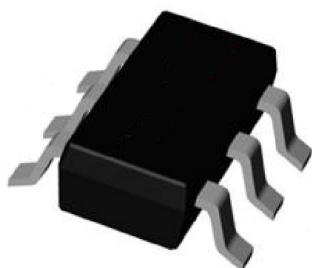
Feature

- Trench Power LV MOSFET technology
- High density cell design for low $R_{DS(ON)}$
- High Speed switching
- Suffix "-Q1" for AEC-Q101

Application

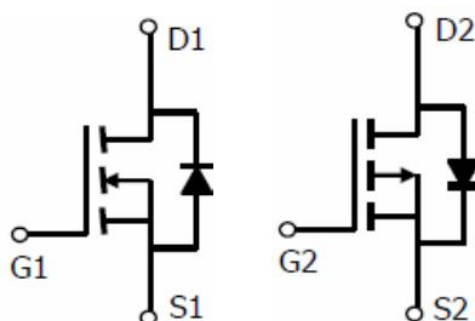
- Wireless charger
- Load switch
- Power management

Package

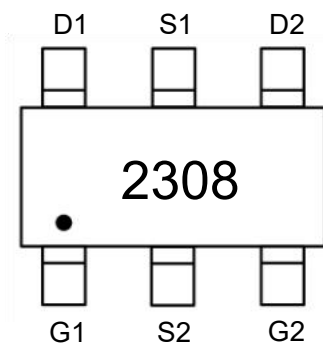


SOT-23-6L

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	± 10	± 10	V
Continuous Drain Current	I_D	5.6	-3.7	A
Continuous Drain Current ($T_A=70^{\circ}\text{C}$)	$I_D (70^{\circ}\text{C})$	4.5	-3	A
Pulsed Drain Current ¹⁾	I_{DM}	19	-15	A
Power Dissipation	P_D	1.3	1.3	W
Thermal Resistance Junction-to-Ambient ²⁾	$R_{\theta JA}$	96	96	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	-55 ~ +150	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	-55 ~ +150	$^{\circ}\text{C}$

N-CH Electrical characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.62	1	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =4.5A		19.5	25	mΩ
		V _{GS} =2.5V, I _D =3A		25	32	
		V _{GS} =1.8V, I _D =2A		33	49	
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f =1MHz		418		pF
Output Capacitance	C _{oss}			82		
Reverse Transfer Capacitance	C _{rss}			70		
Total Gate Charge	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =4.5A		6.05		nC
Gtae-Source Charge	Q _{gs}			1.07		
Gtae-Drain Charge	Q _{gd}			1.95		
Turn-on delay time	t _{d(on)}	V _{DS} =10V, V _{GS} =4.5V R _G =3Ω, R _L =1Ω		4.2		nS
Turn-on rise time	t _r			19.8		
Turn-off delay time	t _{d(off)}			22.6		
Turn-off fall time	t _f			23.2		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				5.6	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =5.6A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =4.5A, di/dt =100A/μs		17.9		nS
Reverse Recovery Charge	Q _{rr}			1.38		nC

P-CH Electrical characteristics (T_J=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250μA	-20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.4	-0.62	-1	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-3.5A		49	64	mΩ
		V _{GS} =-2.5V, I _D =-3A		59	80	
		V _{GS} =-1.8V, I _D =-2A		79	110	
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =-10V, V _{GS} =0V, f =1MHz		438		pF
Output Capacitance	C _{oss}			76		
Reverse Transfer Capacitance	C _{rss}			62		
Total Gate Charge	Q _g	V _{DS} =-15V, V _{GS} =-10V I _D =-3.4A		5.41		nC
Gtae-Source Charge	Q _{gs}			1.17		
Gtae-Drain Charge	Q _{gd}			1.24		
Turn-on delay time	t _{d(on)}	V _{DS} =-10V, V _{GS} =-4.5V I _D =-1A, R _G =3Ω		6.4		nS
Turn-on rise time	t _r			21.8		
Turn-off delay time	t _{d(off)}			37.4		
Turn-off fall time	t _f			34		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-3.7	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =-3.7A			-1.2	V
Reverse Recovery Time	T _{rr}	I _F =-3.4A, di/dt =100A/μs		24.5		nS
Reverse Recovery Charge	Q _{rr}			4		nC

Notes:

- 1) Pulse Test: Pulse Width ≤300us, Duty cycle ≤2%.
- 2) R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design, while R_{θJA} is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.
- 3) Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics

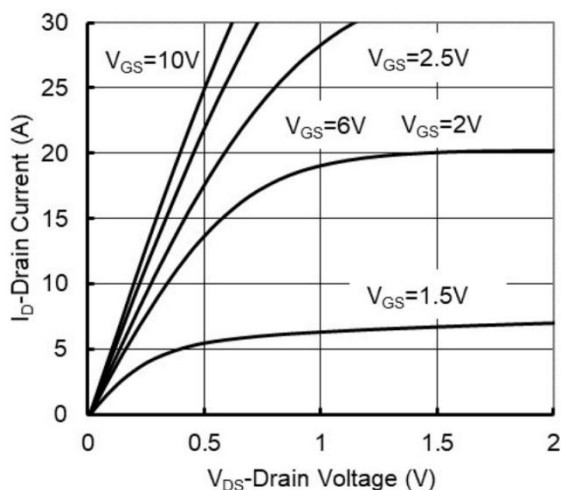


Figure1. Output Characteristics

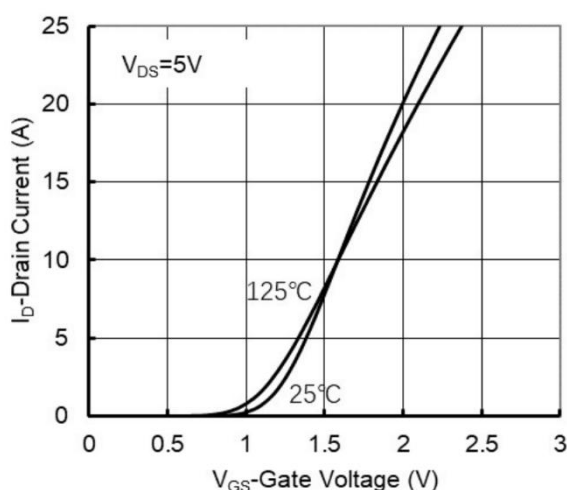


Figure2. Transfer Characteristics

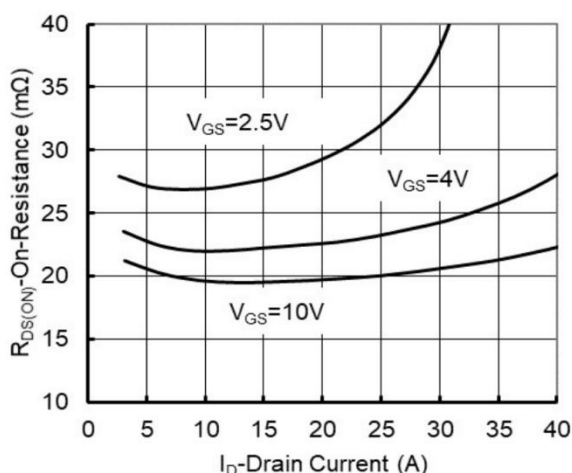


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

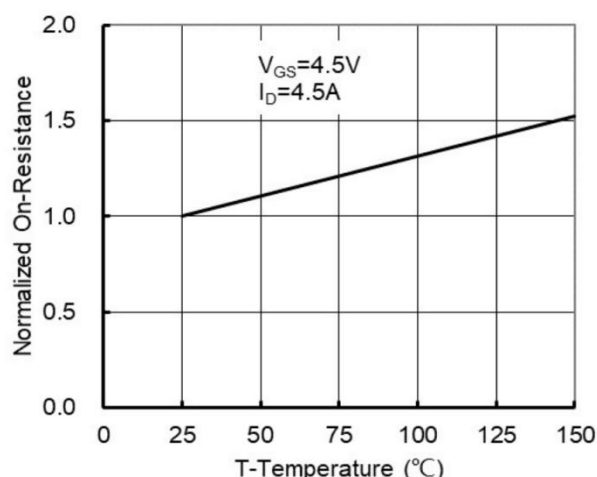


Figure 4: On-Resistance vs. Junction Temperature

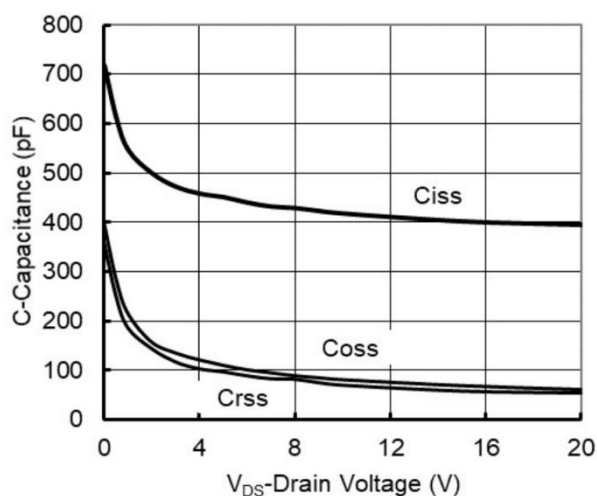


Figure5. Capacitance Characteristics

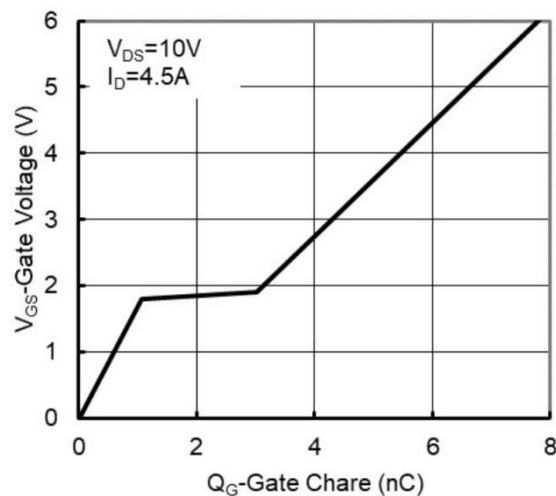


Figure6. Gate Charge

N-Channel Typical Characteristics

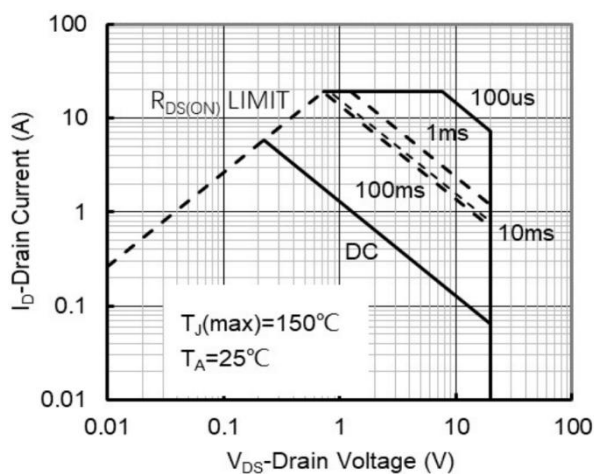


Figure7. Safe Operation Area

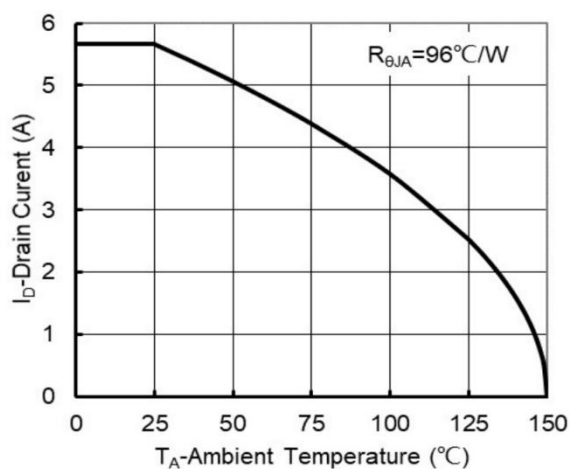


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

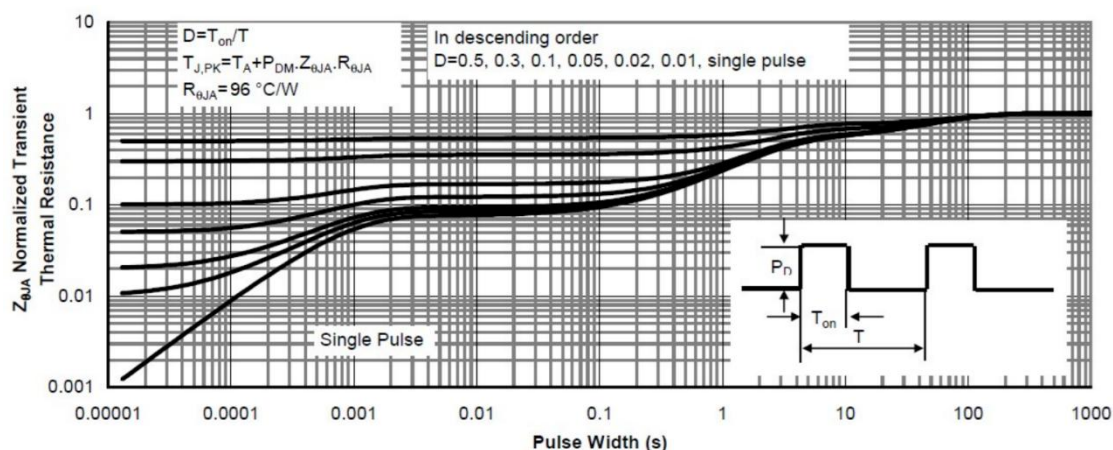


Figure9. Normalized Maximum Transient Thermal Impedance

P-Channel Typical Characteristics

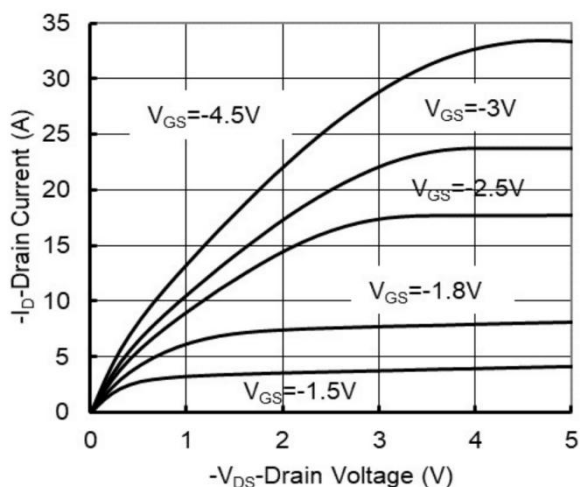


Figure1. Output Characteristics

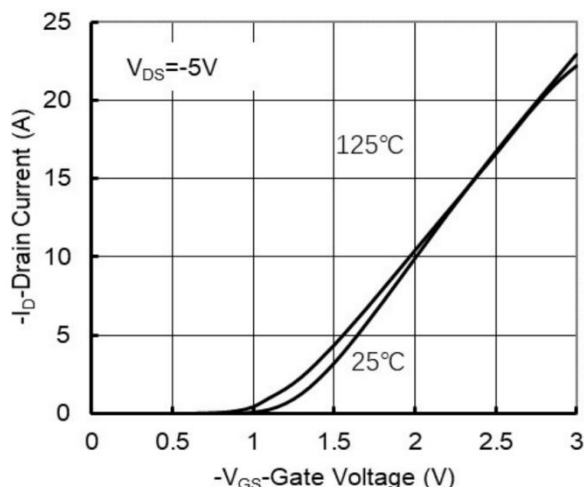


Figure2. Transfer Characteristics

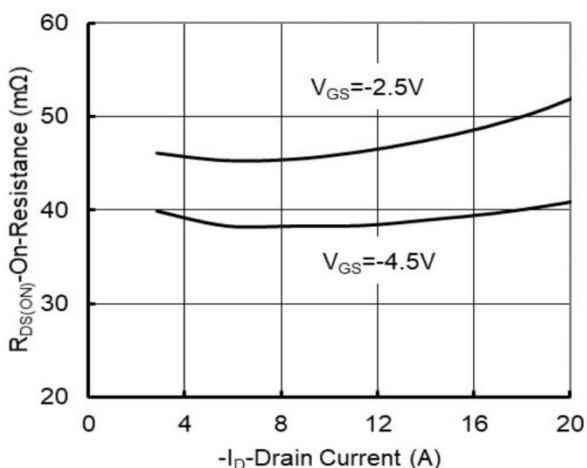


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

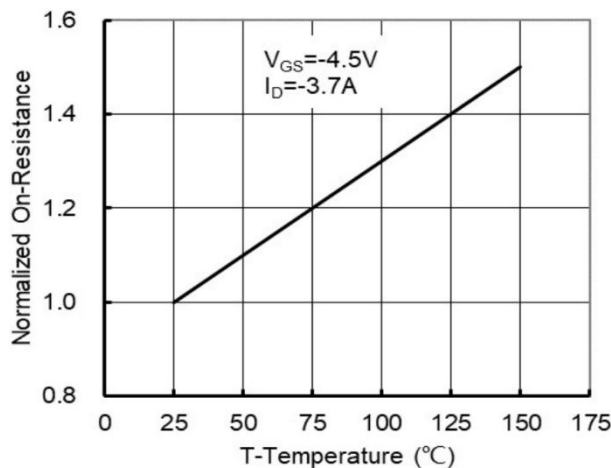


Figure 4: On-Resistance vs. Junction Temperature

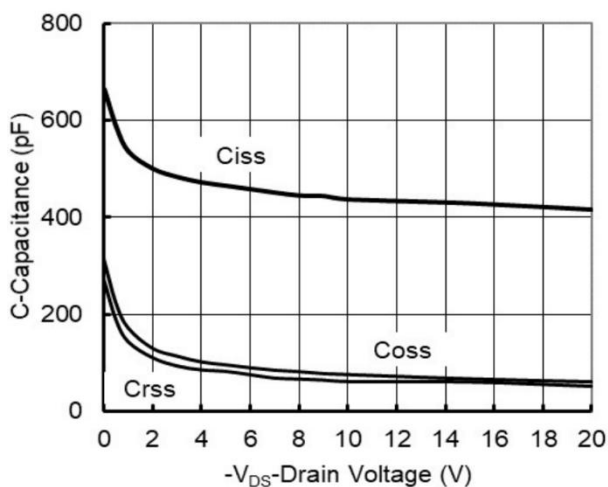


Figure5. Capacitance Characteristics

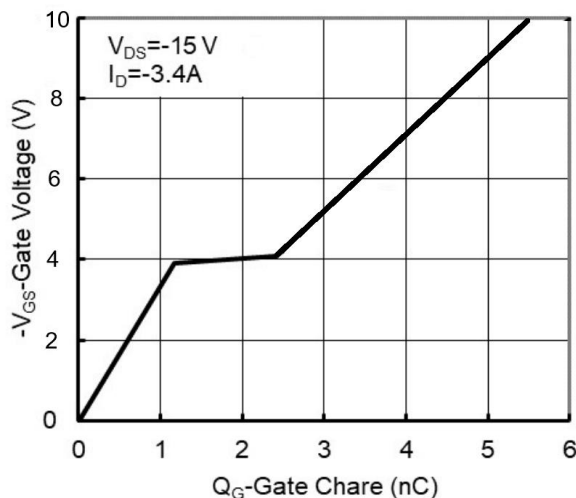


Figure6. Gate Charge

P-Channel Typical Characteristics

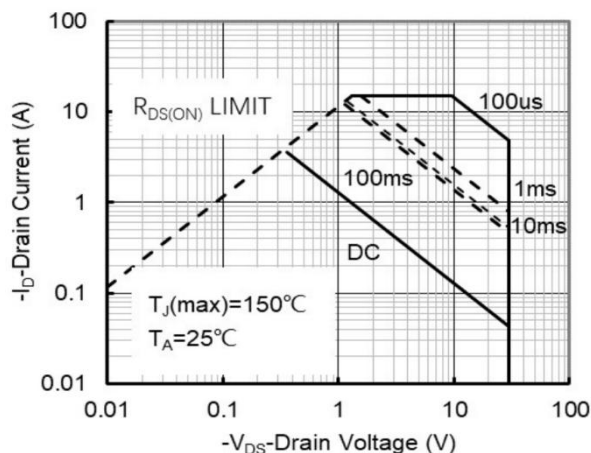


Figure7. Safe Operation Area

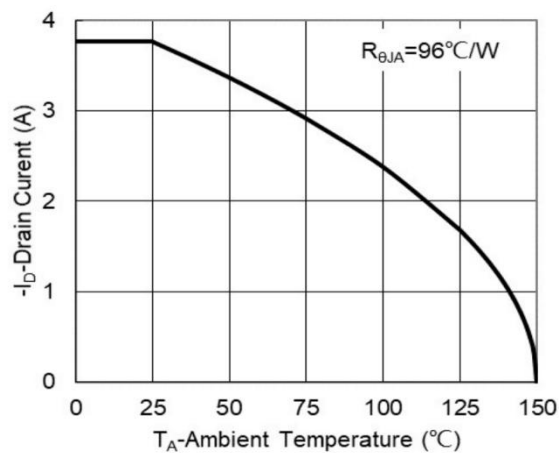


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

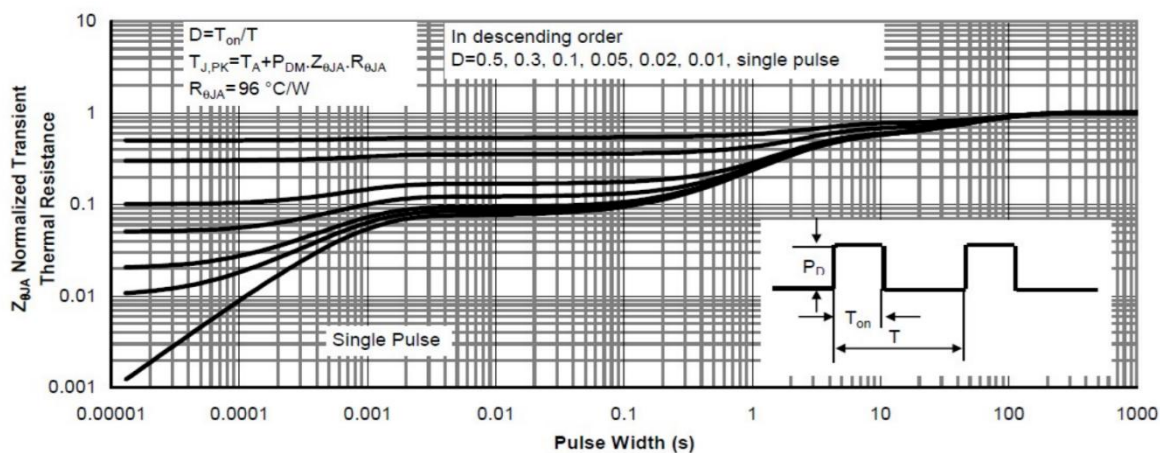
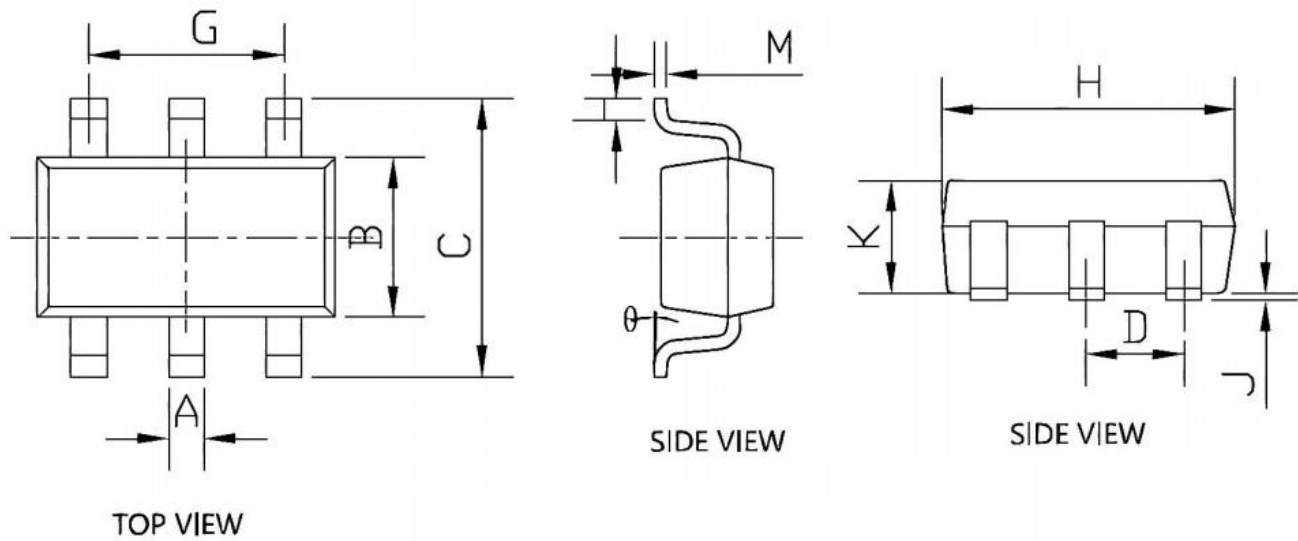


Figure9. Normalized Maximum Transient Thermal Impedance

SOT-23-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.300	0.500	0.012	0.020
B	1.500	1.700	0.059	0.067
C	2.650	2.950	0.104	0.116
D	0.950 BSC.		0.037 BSC.	
G	1.900 BSC.		0.075 BSC.	
H	2.820	3.020	0.111	0.119
J	0.000	0.100	0.000	0.004
K	1.050	1.150	0.041	0.045
L	0.300	0.600	0.012	0.024
M	0.100	0.200	0.004	0.008
θ	0°	8°	0°	8°