

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-20V	60mΩ@-4.5V	-4.5A
	80mΩ@-2.5V	

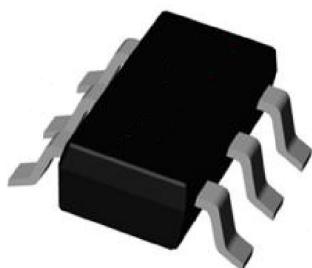
Feature

- Advanced trench technology
- Excellent $R_{DS(on)}$
- Low gate charge

Application

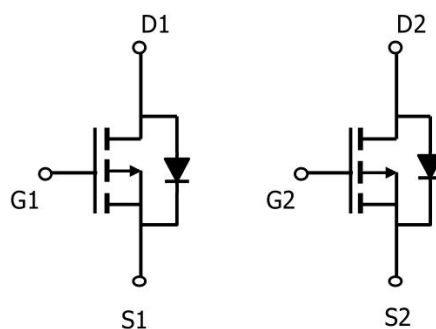
- Lithium battery protection
- Wireless impact
- Mobile phone fast charging

Package

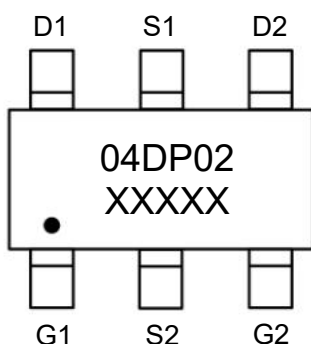


SOT-23-6L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ¹⁾ ($V_{GS}=-10\text{V}$)	I_D	-4.5	A
Continuous Drain Current ¹⁾ ($V_{GS}=-10\text{V}$, $T_A=70^{\circ}\text{C}$)	$I_D(70^{\circ}\text{C})$	-3.9	A
Pulsed Drain Current ²⁾	I_{DM}	-14	A
Power Dissipation ³⁾	P_D	1.5	W
Thermal Resistance Junction to Ambient ¹⁾	$R_{\theta JA}$	85	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

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} =±12V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.45	-0.6	-1	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =-4.5V, I _D =-4A		49	60	mΩ
		V _{GS} =-2.5V, I _D =-3A		64	80	
Dynamic characteristics ⁵⁾						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, f =1MHz		677		pF
Output Capacitance	C _{oss}			82		
Reverse Transfer Capacitance	C _{rss}			73		
Total Gate Charge	Q _g	V _{DS} =-15V, V _{GS} =-4.5V I _D =-3A		10.1		nC
Gate-Source Charge	Q _{gs}			1.21		
Gate-Drain Charge	Q _{gd}			2.46		
Turn-on delay time	t _{d(on)}	V _{DS} =-10V, V _{GS} =-4.5V I _D =-3A, R _G =3.3Ω		5.6		nS
Turn-on rise time	t _r			32.2		
Turn-off delay time	t _{d(off)}			45.6		
Turn-off fall time	t _f			29.2		
Source-Drain Diode characteristics						
Diode Forward Current ^{1,4)}	I _S	V _D =V _G =0V , Force Current			-3	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =-1A			-1	V

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2) The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- 3) The power dissipation is limited by 150°C 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.
- 5) Guaranteed by design, not subject to production.

Typical Characteristics

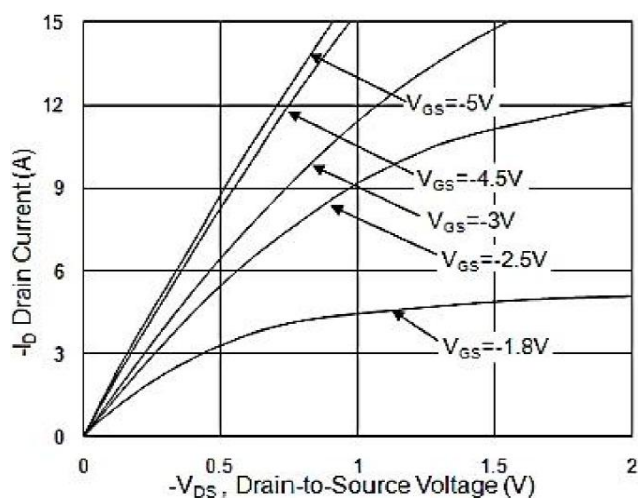


Fig.1 Typical Output Characteristics

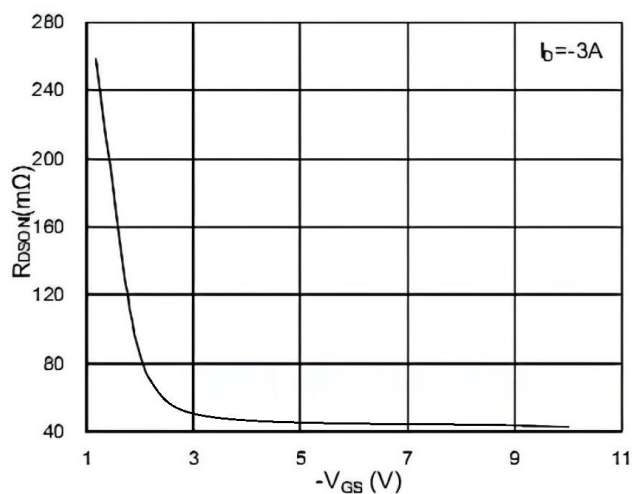


Fig.2 On-Resistance vs. Gate-Source

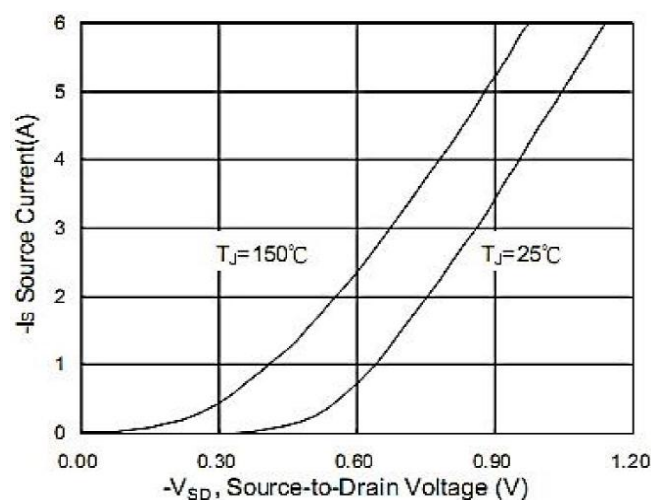


Fig.3 Forward Characteristics Of Reverse

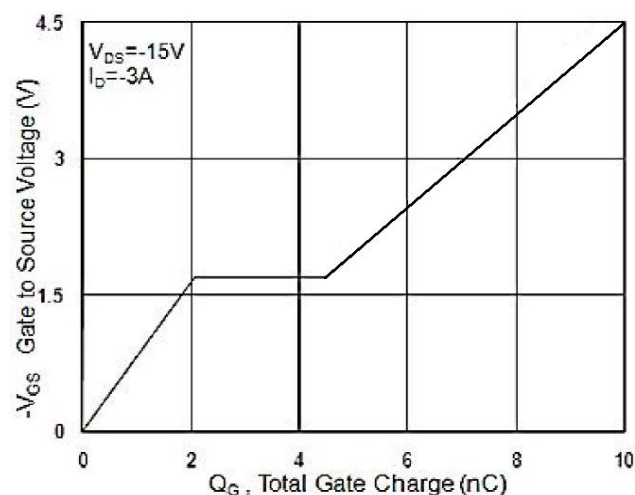


Fig.4 Gate-Charge Characteristics

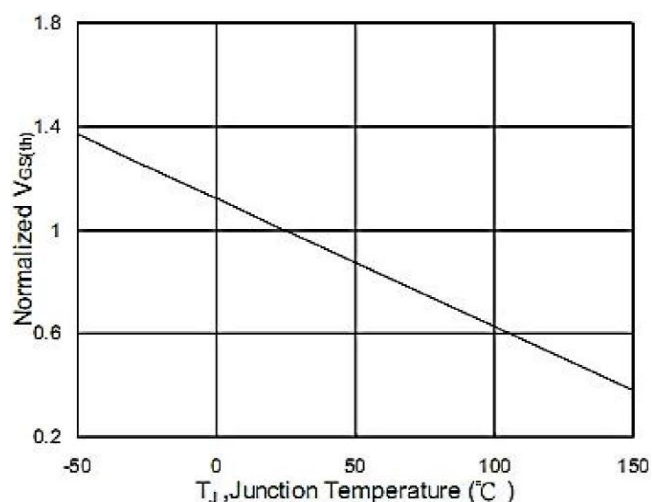


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

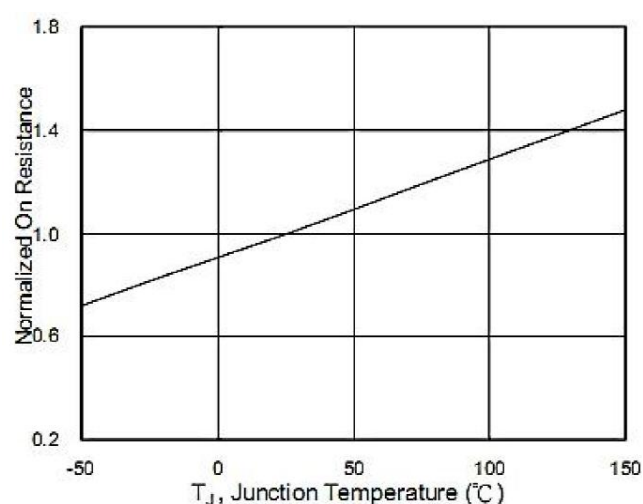


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics

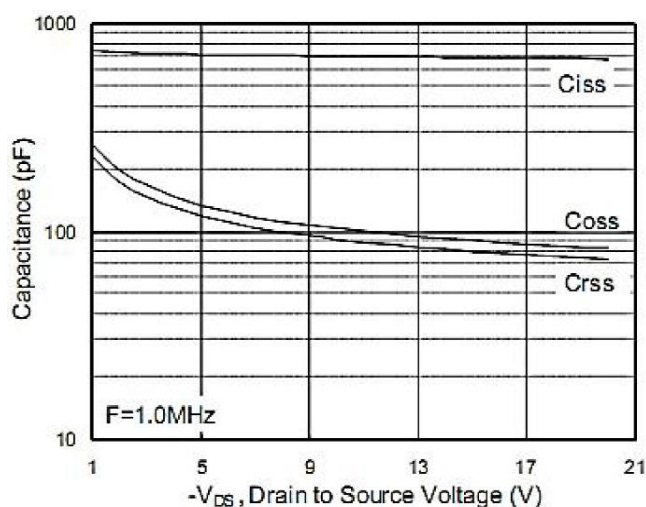


Fig.7 Capacitance

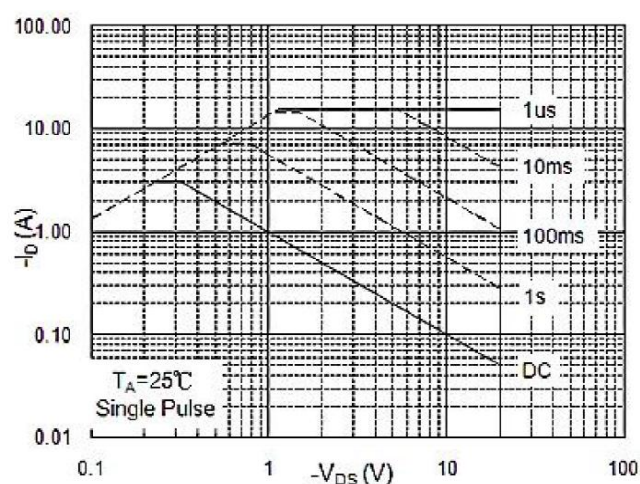


Fig.8 Safe Operating Area

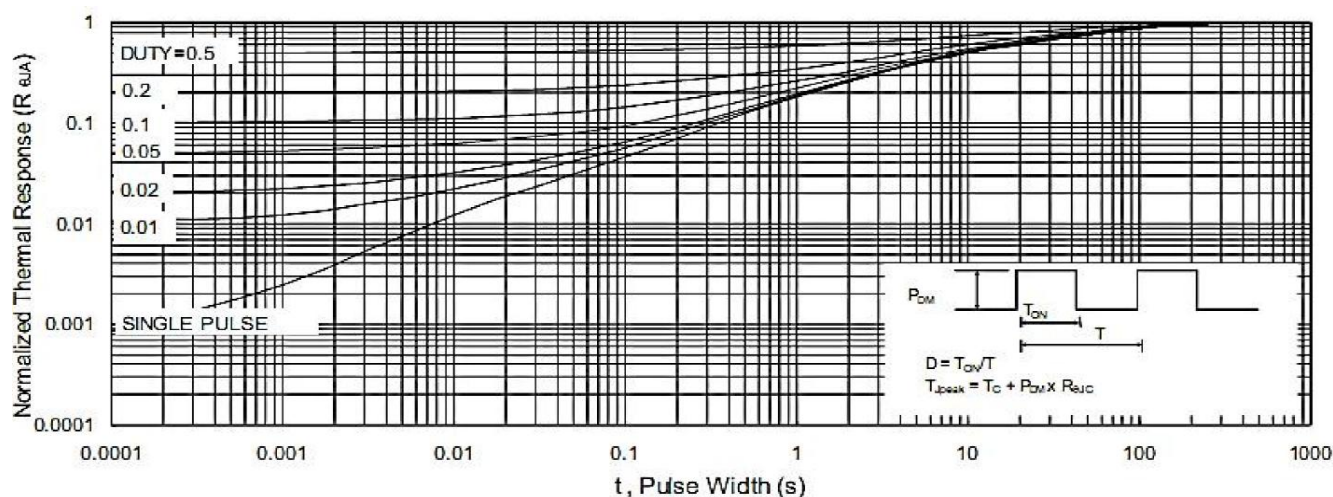


Fig.9 Normalized Maximum Transient Thermal Impedance

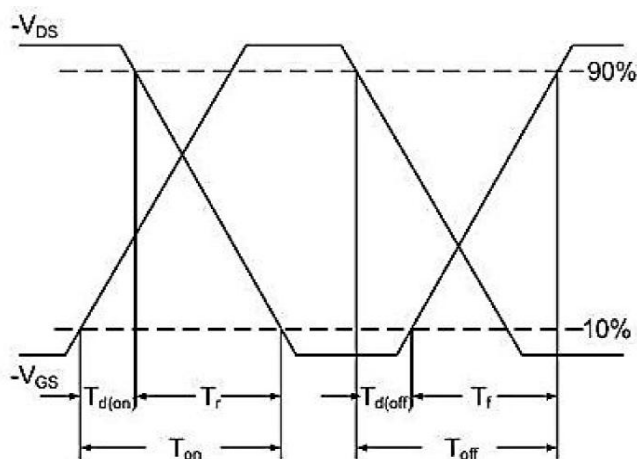


Fig.10 Switching Time Waveform

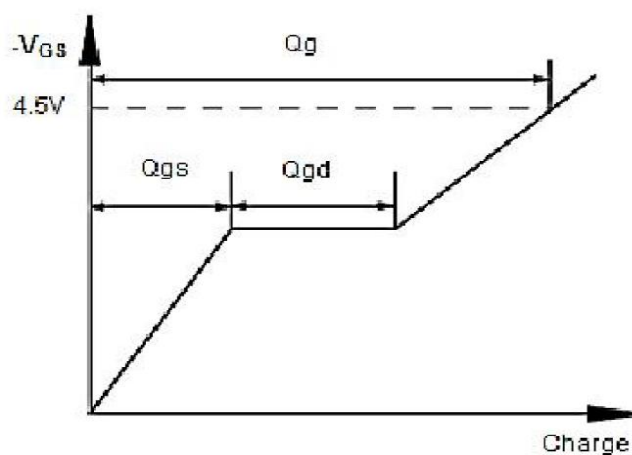
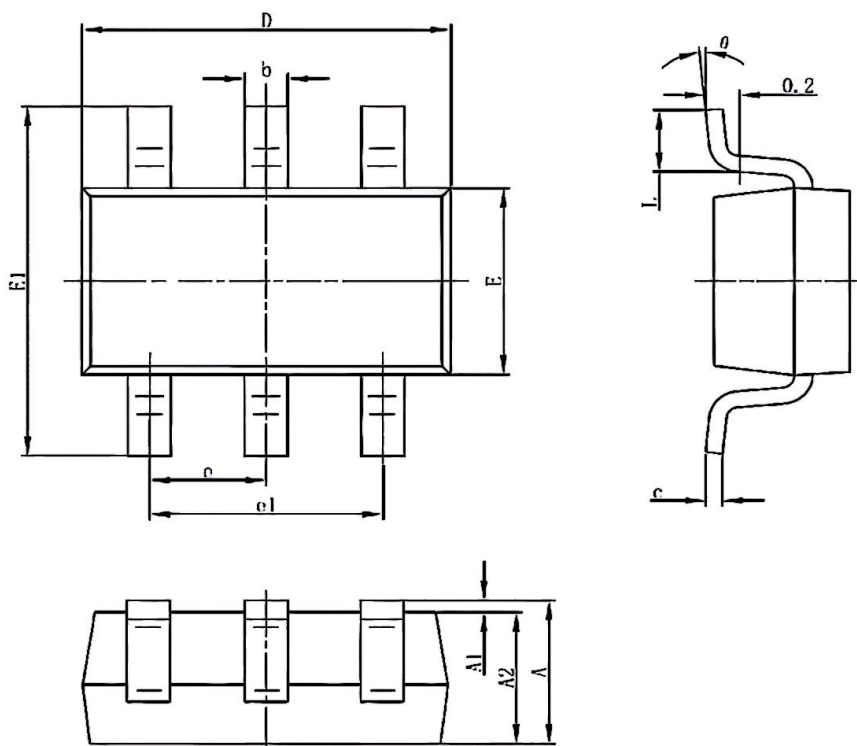


Fig.11 Gate Charge Waveform

SOT-23-6L 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°