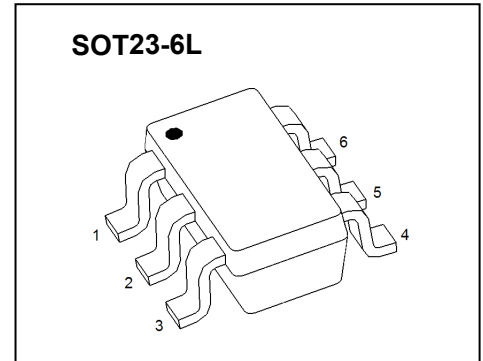


**40V P-Channel MOSFETs**

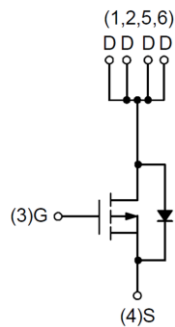
$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-40V	35mΩ@-10V	-7A
	50mΩ@-4.5V	


**FEATURE**

- High Cell Density Trenched P-ch MOSFETs
- Excellent  $R_{DS(on)}$
- Low Gate Charge

**APPLICATION**

- Power Switching Application
- Hard Switched and High Frequency Circuits
- DC-DC Converter

**Equivalent Circuit**

**ABSOLUTE MAXIMUM RATINGS ( $T_C=25^\circ\text{C}$  unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current <sup>1</sup>	$I_D$	-7	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-28	A
Single Pulse Avalanche Energy <sup>3</sup>	$E_{AS}$	40	mJ
Avalanche Current	$I_{AS}$	-27	A
Power Dissipation <sup>4</sup>	$P_D$	1.1	W
Thermal Resistance from Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	110	$^\circ\text{C/W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

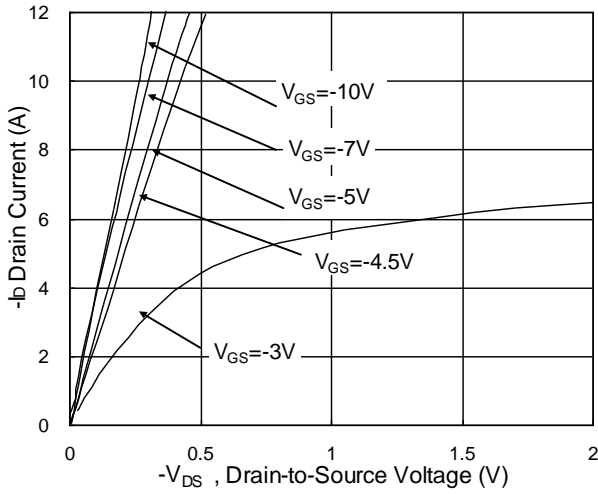
**MOSFET ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-40			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -32V, V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1.2	-1.5	-2.5	V
Drain-source on-resistance <sup>2</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -5A		28	35	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4A		38	50	
Forward tranconductance	g <sub>FS</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -8A		12		S
<b>Dynamic characteristics</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1MHz		1415		pF
Output capacitance	C <sub>oss</sub>			134		
Reverse transfer capacitance	C <sub>rss</sub>			102		
<b>Switching Characteristics</b>						
Total gate charge@-4.5V	Q <sub>g</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -1A		11.5		nC
Gate-source charge	Q <sub>gs</sub>			3.5		
Gate-drain charge	Q <sub>gd</sub>			3.3		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = -15V, V <sub>GS</sub> = -10V, R <sub>G</sub> = 3.3 Ω, I <sub>D</sub> = -1A		22		ns
Turn-on rise time	t <sub>r</sub>			15.7		
Turn-off delay time	t <sub>d(off)</sub>			59		
Turn-off fall time	t <sub>f</sub>			5.5		
<b>Diode Characteristics</b>						
Continuous Source Current <sup>1,5</sup>	I <sub>S</sub>	V <sub>G</sub> = V <sub>D</sub> = 0V, Force Current			-7	A
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A, T <sub>J</sub> = 25°C			-1.2	V

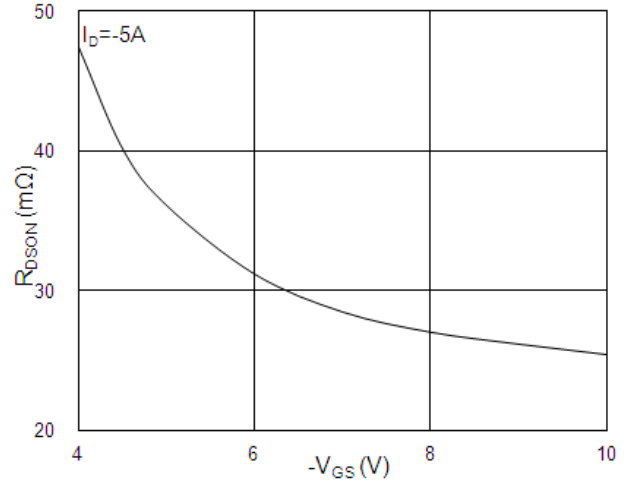
**Notes:**

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
3. The E<sub>AS</sub> data shows Max. rating. The test condition is V<sub>DD</sub> = -25V, V<sub>GS</sub> = -10V, L = 0.1mH, I<sub>AS</sub> = -27A
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

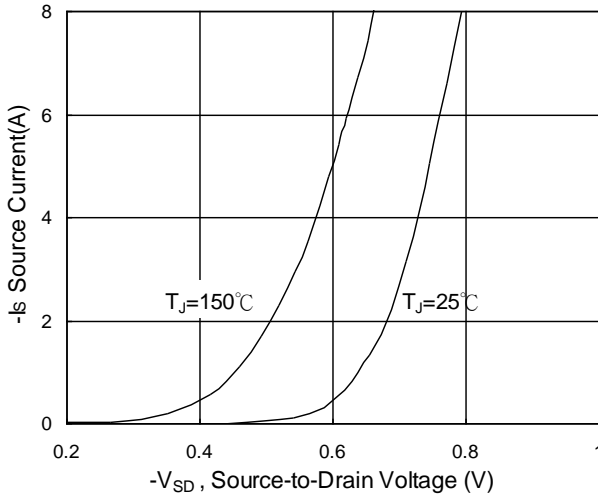
**Typical Characteristics**



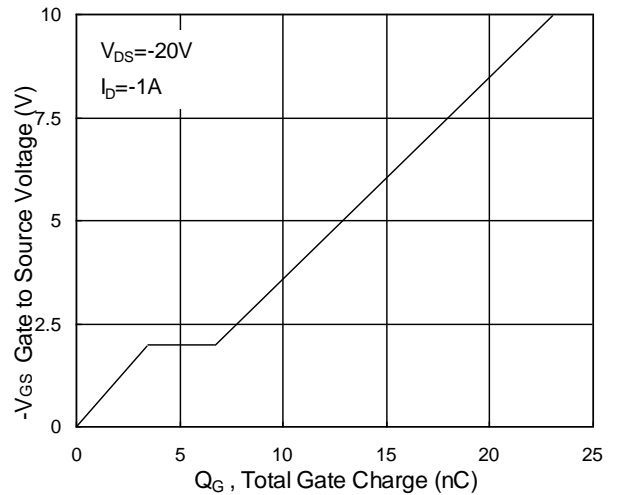
**Fig.1 Typical Output Characteristics**



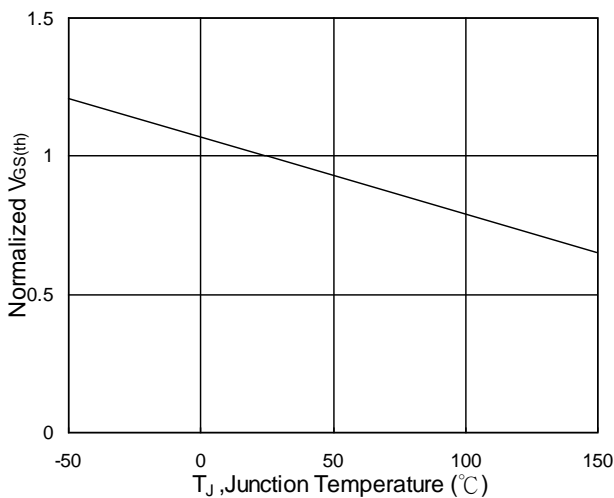
**Fig.2 On-Resistance vs. Gate-Source Voltage**



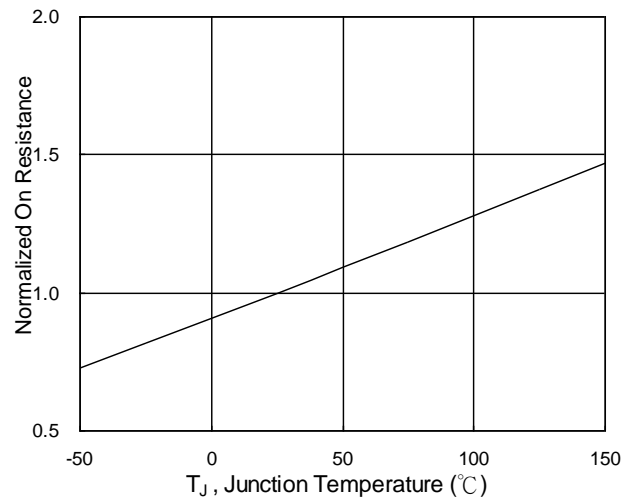
**Fig.3 Forward Characteristics of Reverse**



**Fig.4 Gate Charge Characteristics**

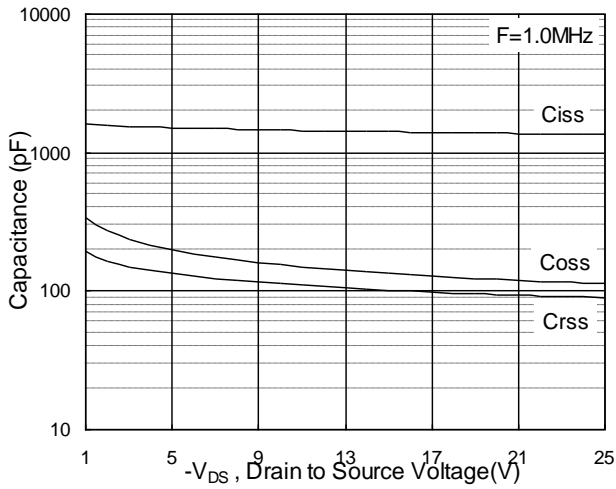


**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$**

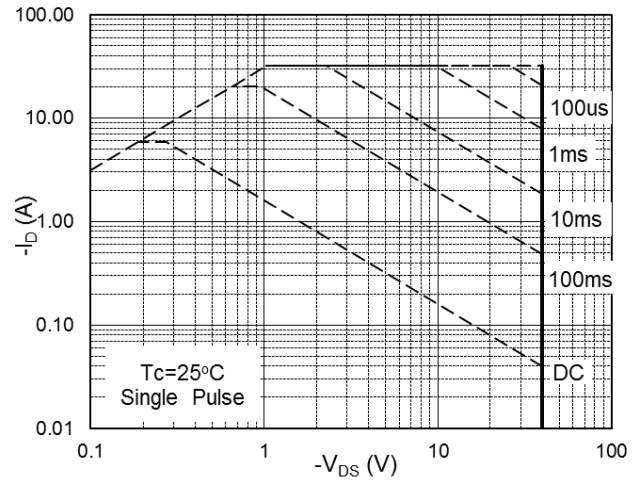


**Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$**

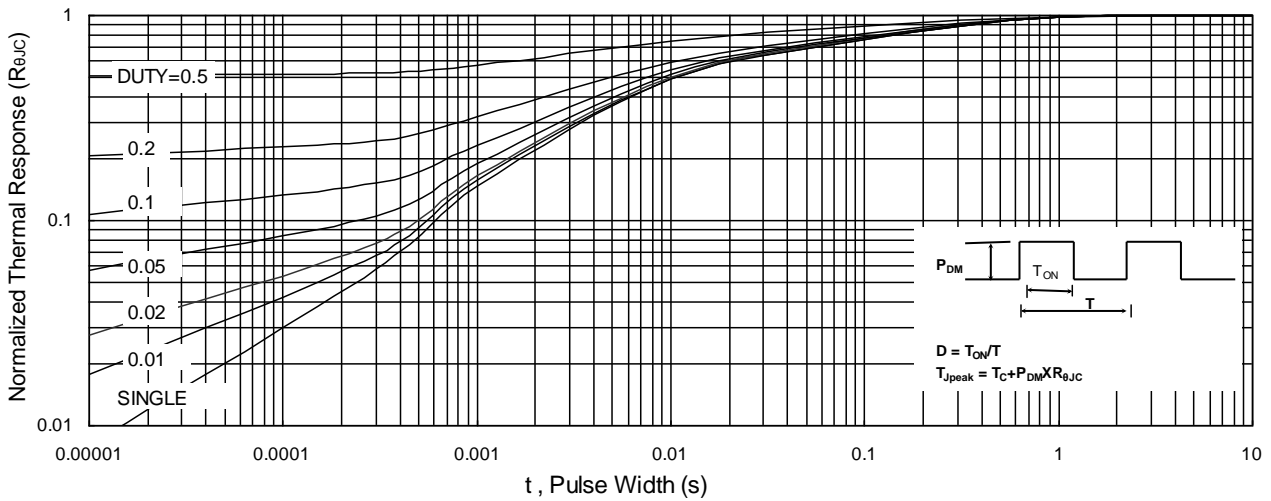
**Typical Characteristics**



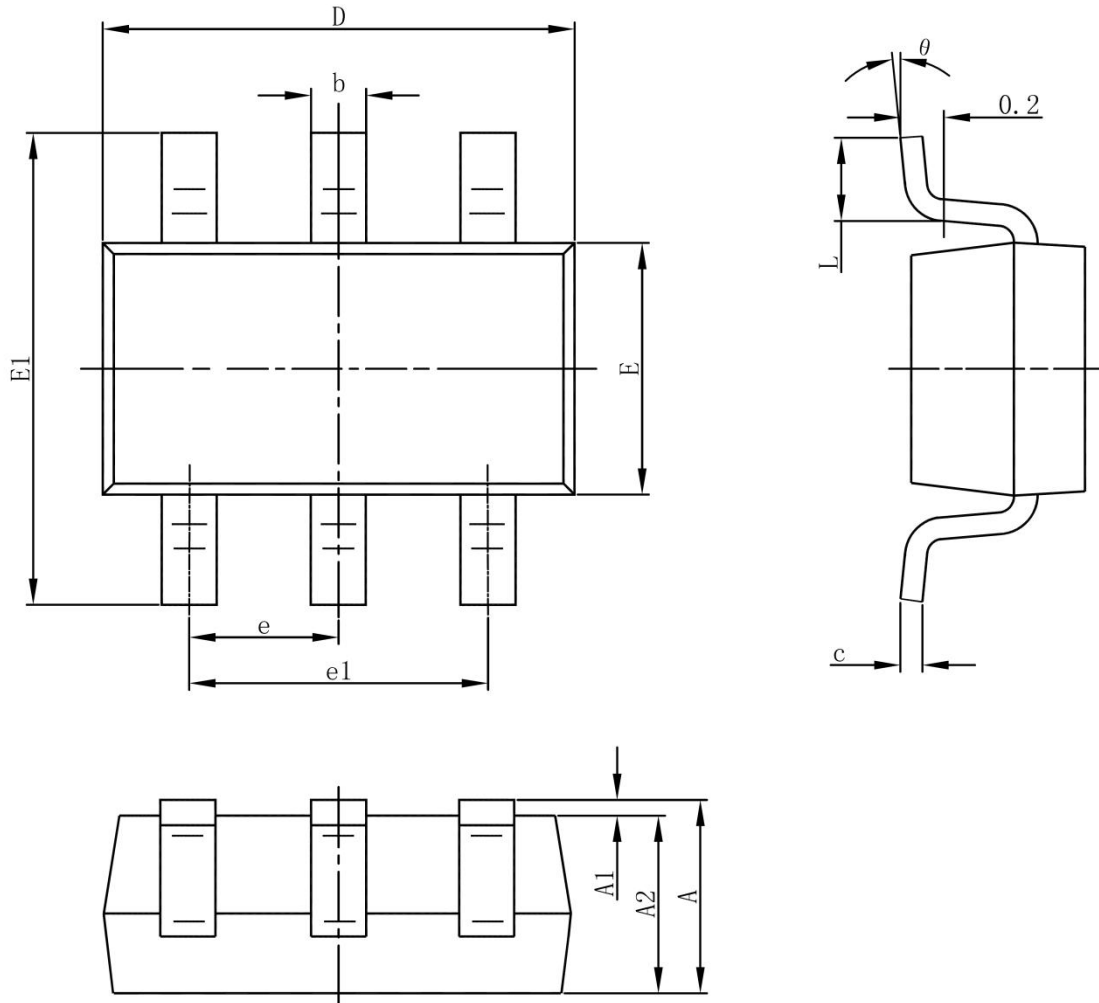
**Fig.7 Capacitance**



**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**

**SOT23-6L Package Outline Dimensions**


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°

V1.0