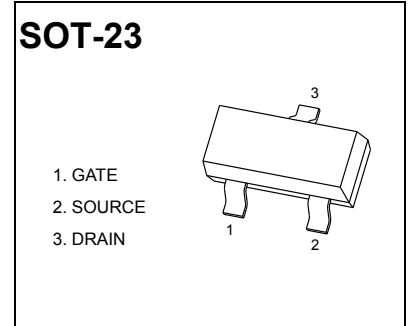


## SOT-23 Plastic-Encapsulate MOSFETS

### 30V N-Channel Enhancement Mode Field Effect Transistor

$V_{(BR)DSS}$	$R_{DS(on)}$ Typ	$I_D$
30V	27mΩ @ 4.5V	5.8A
	29mΩ @ 3.3V	



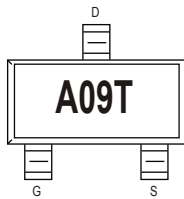
#### FEATURE

High dense cell design for extremely low RDS(ON)  
Exceptional on-resistance and maximum DC current capability

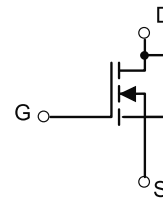
#### APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

#### MARKING



#### Equivalent circuit



#### PACKAGE SPECIFICATIONS

Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (pcs)	Box Size (mm)	QTY/Box (pcs)	Carton Size (mm)	Q'TY/Carton (pcs)
SOT-23	7'	330	3000	203×203×195	45000	438×438×220	180000

#### MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	30	V	
Gate-Source Voltage	$V_{GS}$	±12		
Continuous Drain Current	$I_D$	$T_A=25^\circ\text{C}$	5.8	A
		$T_A=70^\circ\text{C}$	4.6	
Maximum Power Dissipation <sup>2)</sup>	$P_D$	$T_A=25^\circ\text{C}$	1.5	W
		$T_A=70^\circ\text{C}$	0.9	
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	23	A	
Operating Junction and Storage Temperature Range	$T_J$	150	°C	
Storage Temperature Range	$T_{stg}$	-50 to 150	°C	
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	100	°C/W	

#### Notes

- 1) Pulse width limited by maximum junction temperature.
- 2) Surface Mounted on FR4 Board,  $t \leq 5$  sec.
- 3) The above data are for reference only.



**MOSFET ELECTRICAL CHARACTERISTICS**

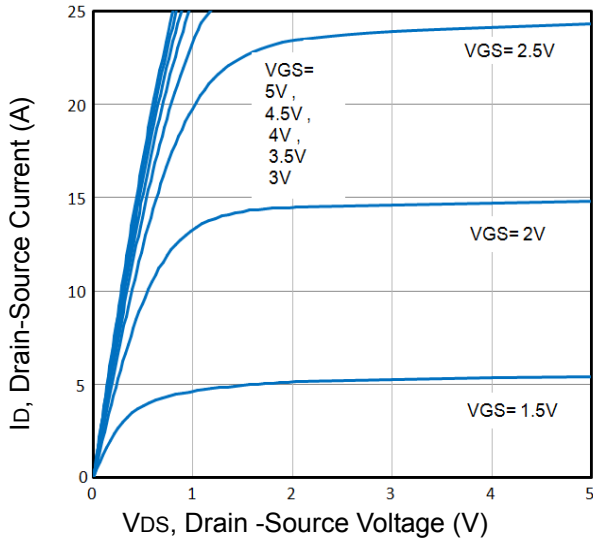
**T<sub>a</sub>=25 °C unless otherwise specified**

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
<b>Off Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250uA	30			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> = 0V			1	uA
	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> = 0V			100	uA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> = 0V			±100	nA
<b>On characteristics</b>						
Drain-source on-resistance (note 3)	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.8A		27	32	m
		V <sub>GS</sub> =3.3V, I <sub>D</sub> =4A		29	45	m
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =2A		35	50	m
Forward tranconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =5A	8			S
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.5	0.8	1.2	V
<b>Dynamic Characteristics (note 4)</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f =1MHz		635		pF
Output capacitance	C <sub>oss</sub>			135		pF
Reverse transfer capacitance	C <sub>rss</sub>			40		pF
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V I <sub>D</sub> =5A, V <sub>GS</sub> =4.5V		10.5		nC
Gate Source Charge	Q <sub>gs</sub>			1.6		nC
Gate Drain Charge	Q <sub>gd</sub>			2.7		nC
<b>Switching Characteristics (note 4)</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, I <sub>D</sub> =5A, R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =4.5V		7.5		ns
Turn-on rise time	t <sub>r</sub>			18		ns
Turn-off delay time	t <sub>d(off)</sub>			36		ns
Turn-off fall time	t <sub>f</sub>			5		ns
<b>Drain-source diode characteristics and maximum ratings</b>						
Source drain current(Body Diode)	I <sub>SD</sub>	T <sub>A</sub> =25 °C			1.5	A
Diode forward voltage (note 3)	V <sub>SD</sub>	I <sub>S</sub> =3A, V <sub>GS</sub> =0V		0.82	1.2	V

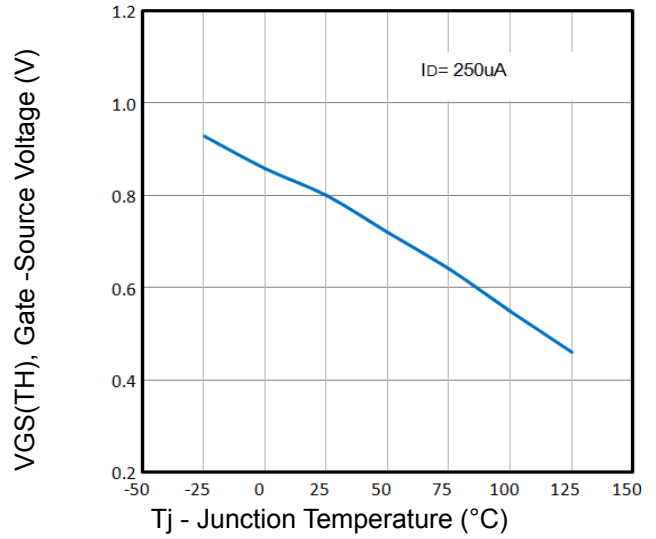
**Note :**

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 5 sec.
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

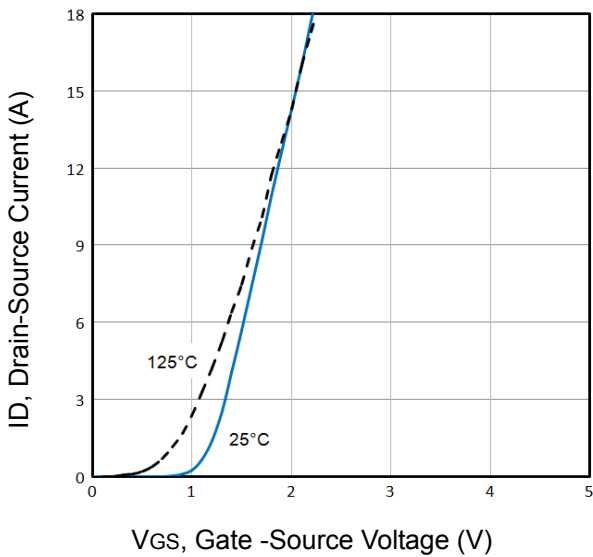
## Typical Characteristics



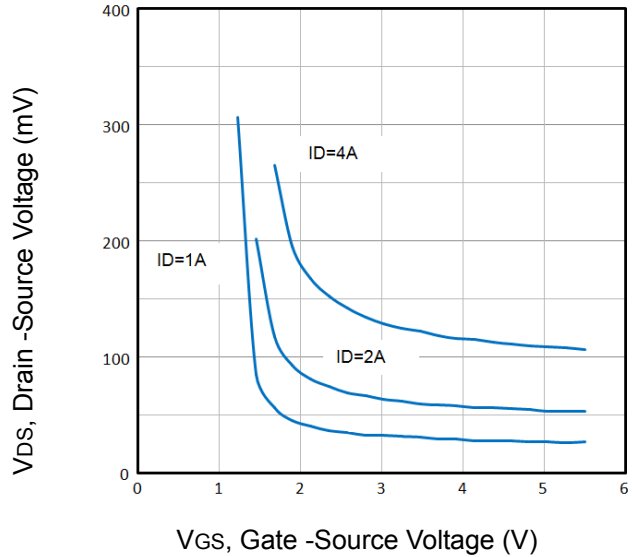
**Fig1.** Typical Output Characteristics



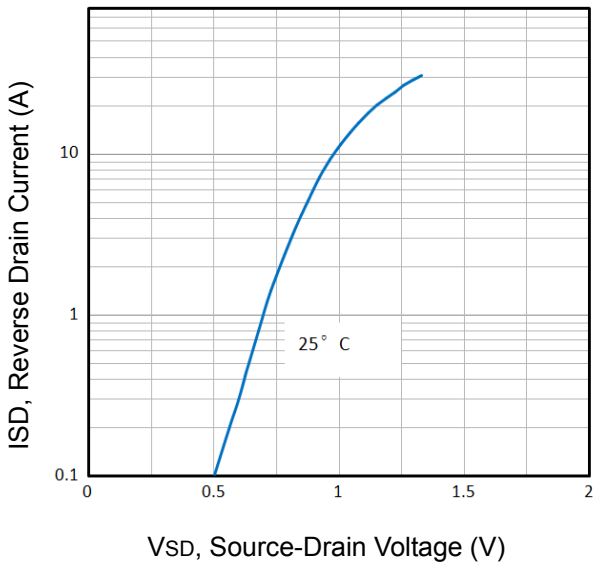
**Fig2.** Normalized Threshold Voltage Vs. Temperature



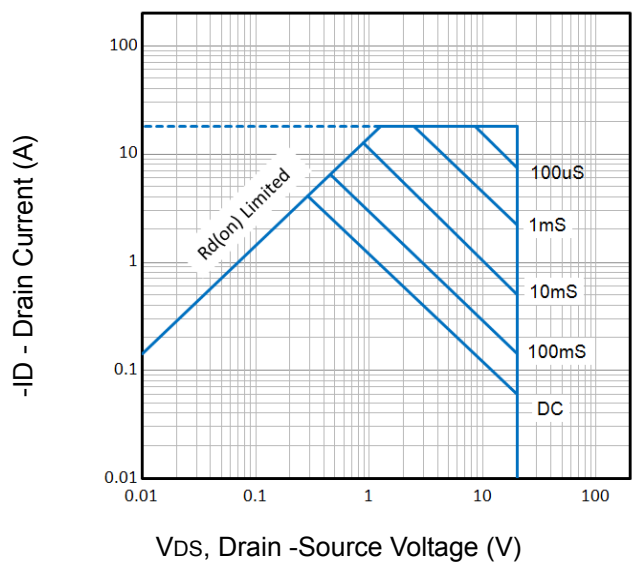
**Fig3.** Typical Transfer Characteristics



**Fig4.** Drain-Source Voltage vs. Gate-Source Voltage



**Fig5.** Typical Source-Drain Diode Forward Voltage



**Fig6.** Maximum Safe Operating Area

The curve above is for reference only.

Typical Characteristics

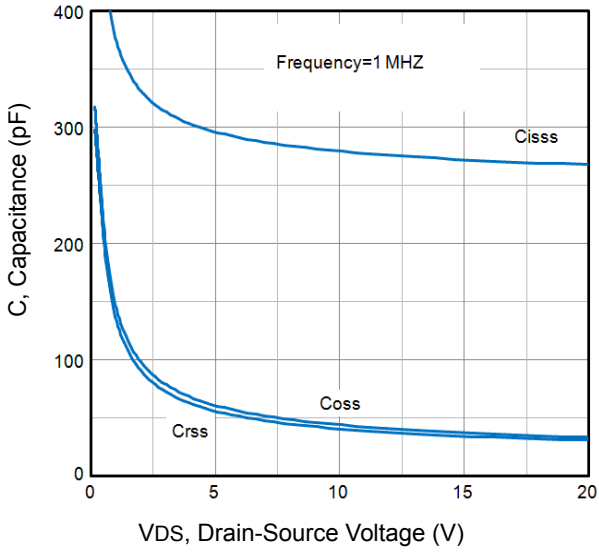


Fig7. Typical Capacitance Vs. Drain-Source Voltage

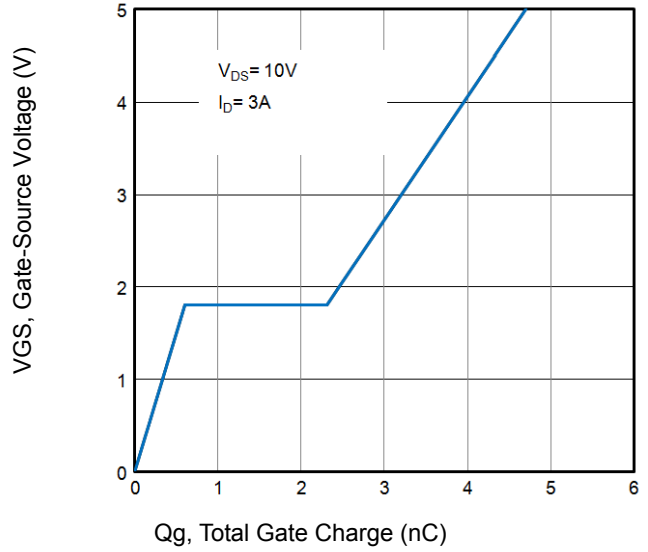


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

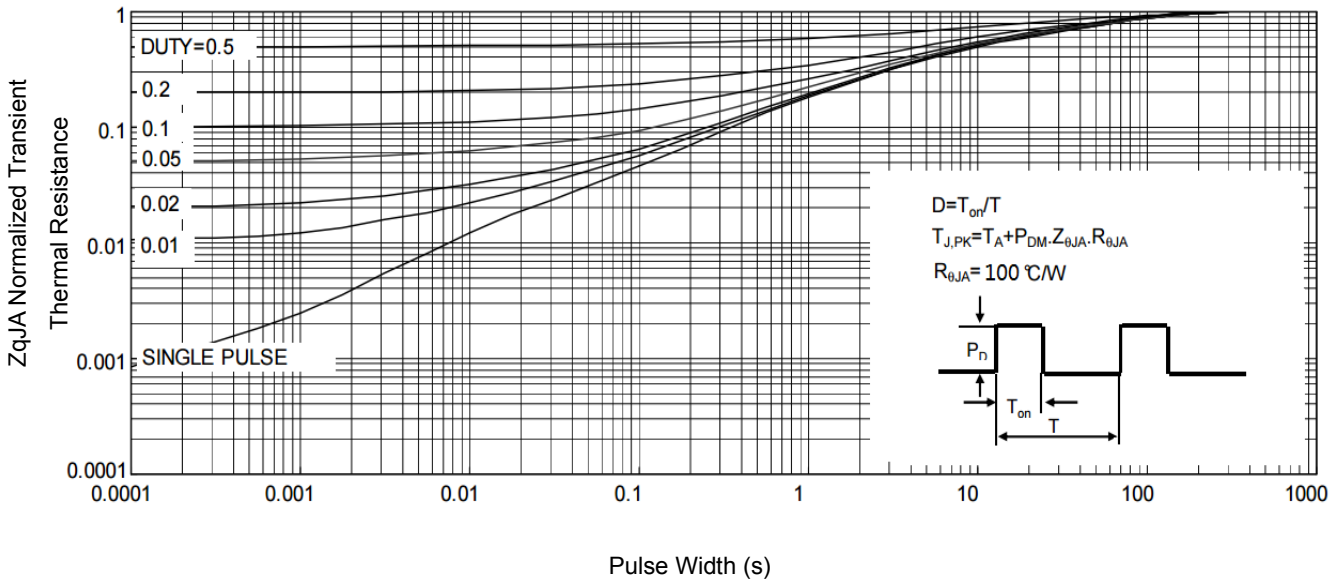


Fig9. Normalized Maximum Transient Thermal Impedance

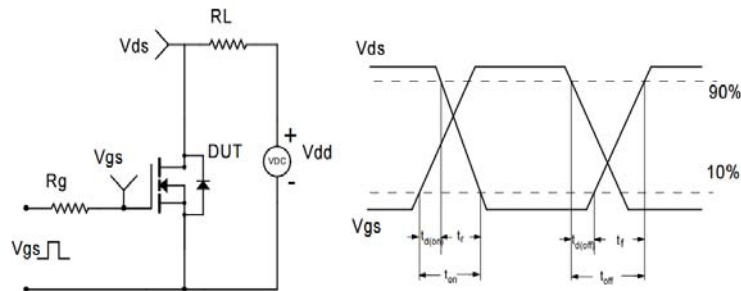
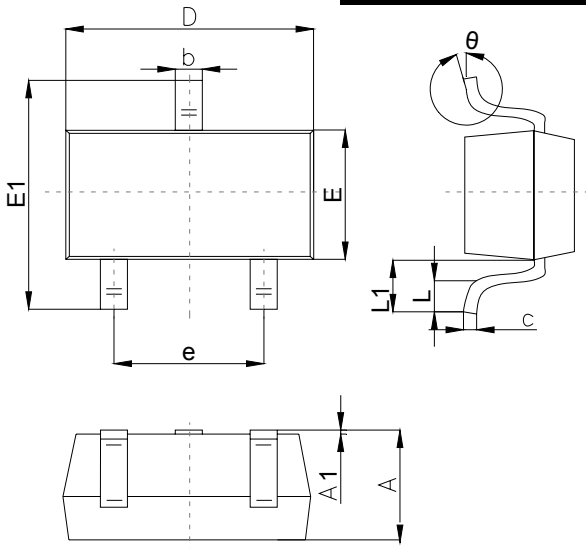
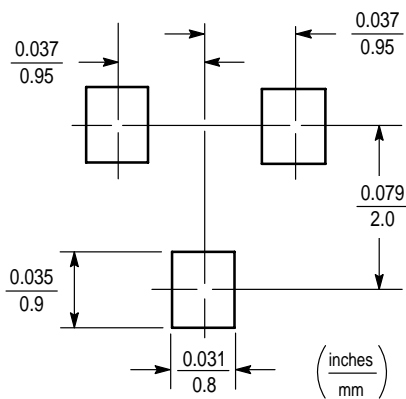


Fig10. Switching Time Test Circuit and waveforms

The curve above is for reference only.

**Outline Drawing**
**SOT-23 Package Outline Dimensions**


Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	0.90		1.40
A1	0.00		0.10
b	0.30		0.50
c	0.08		0.20
D	2.80	2.90	3.10
E	1.20		1.60
E1	2.25		2.80
e	1.80	1.90	2.00
L	0.10		0.50
L1	0.4		0.55
θ	0°		10°

**Suggested Pad Layout**

**Note:**

1. Controlling dimension: in/millimeters.
2. General tolerance: ±0.05mm.
3. The pad layout is for reference purposes only.