

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-40V	35mΩ@-10V	-6A
	50mΩ@-4.5V	

## Feature

- High Cell Density Trenched P-ch MOSFETS
- Excellent RDSON
- Low Gate Charge

## Application

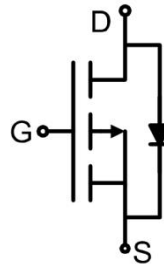
- DC-DC converter
- Power switching application
- Hard switched and high frequency circuits

## Package

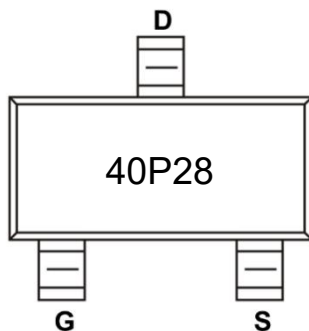


SOT-23-3L

## Circuit diagram



## Marking



### Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1)</sup>	$I_D$	-6	A
Pulsed Drain Current <sup>2)</sup>	$I_{DM}$	-24	A
Power Dissipation <sup>4)</sup>	$P_D$	1	W
Thermal Resistance from Junction to Ambient <sup>1)</sup>	$R_{\theta JA}$	125	$^{\circ}C/W$
Single pulse avalanche energy <sup>3)</sup>	$E_{AS}$	40	mJ
Junction Temperature	$T_J$	150	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}C$

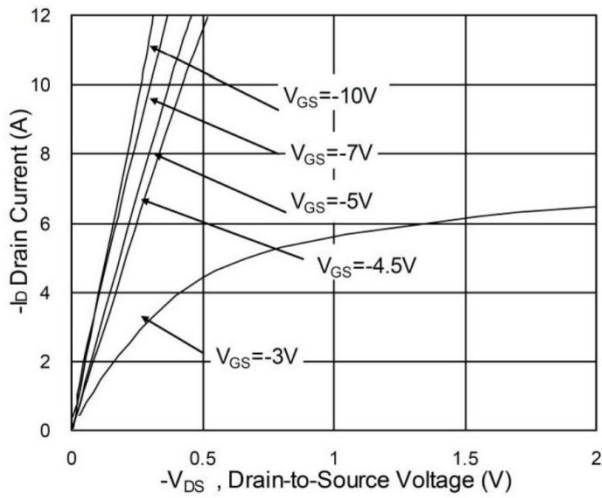
### Electrical characteristics (TA=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-40			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -32V, V_{GS} = 0V$			-1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.2	-1.5	-2.5	V
Drain-source on-resistance <sup>2)</sup>	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -5A$		28	35	m $\Omega$
		$V_{GS} = -4.5V, I_D = -4A$		38	50	
<b>Dynamic characteristics<sup>5)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -15V, V_{GS} = 0V, f = 1MHz$		1415		pF
Output Capacitance	$C_{oss}$			134		
Reverse Transfer Capacitance	$C_{rss}$			102		
Total Gate Charge	$Q_g$	$V_{DS} = -15V, V_{GS} = -4.5V, I_D = -1A$		11.5		nC
Gate-Source Charge	$Q_{gs}$			3.5		
Gate-Drain Charge	$Q_{gd}$			3.3		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -15V, V_{GS} = -10V, I_D = -1A, R_G = 3.3\Omega$		22		nS
Turn-on rise time	$t_r$			15.7		
Turn-off delay time	$t_{d(off)}$			59		
Turn-off fall time	$t_f$			5.5		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>1)</sup>	$I_S$				-7	A
Diode Forward voltage <sup>2)</sup>	$V_{SD}$	$V_{GS} = 0V, I_S = -1A, T_J = 25^{\circ}C$			-1.2	V

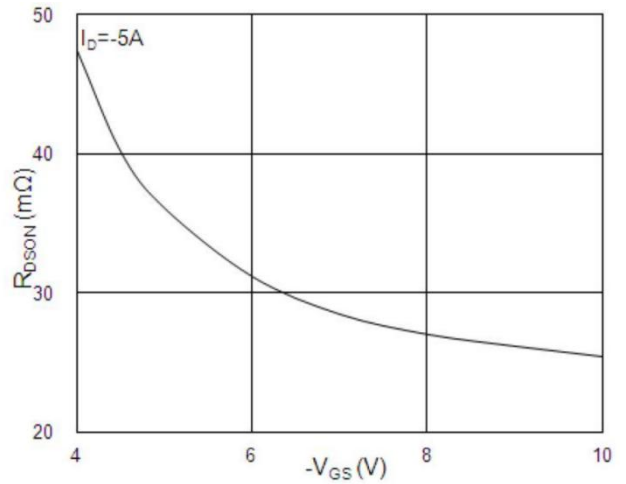
Notes:

- 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  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 3) The  $E_{AS}$  data shows Max. rating. The test condition is  $V_{DD} = -25V, V_{GS} = -10V, L = 0.1mH, I_{AS} = -27A$ .
- 4) The power dissipation is limited by 150°C junction temperature.
- 5) Guaranteed by design, not subject to production.

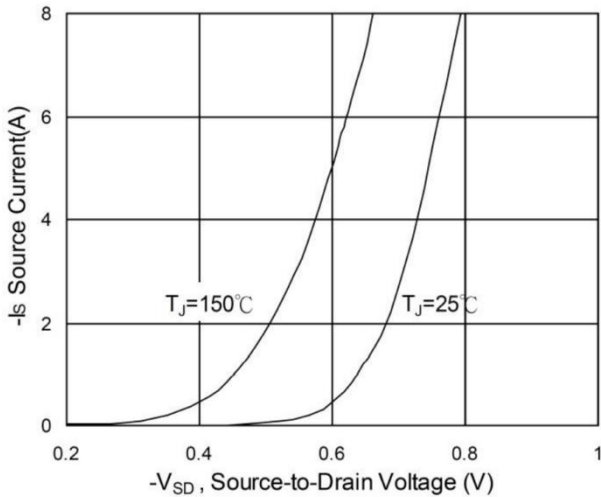
## Typical Characteristics



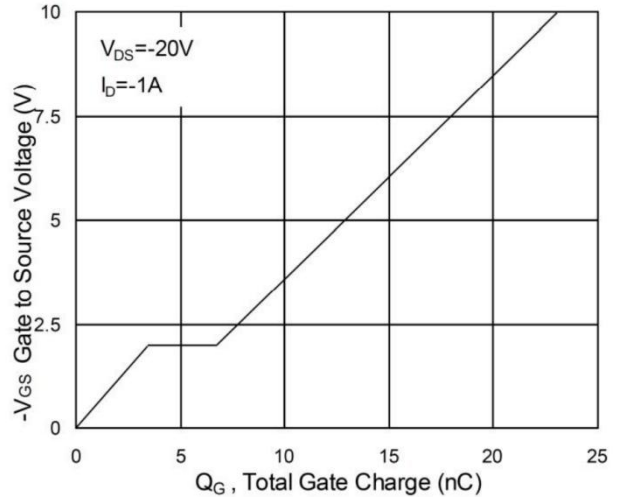
**Fig.1 Typical Output Characteristics**



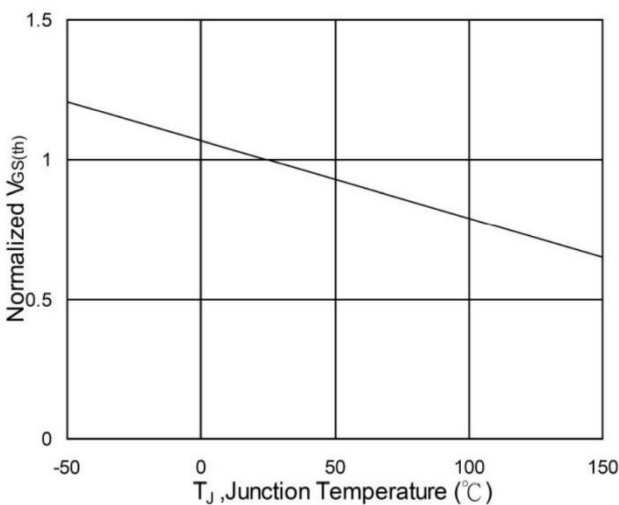
**Fig.2 On-Resistance vs. Gate-Source Voltage**



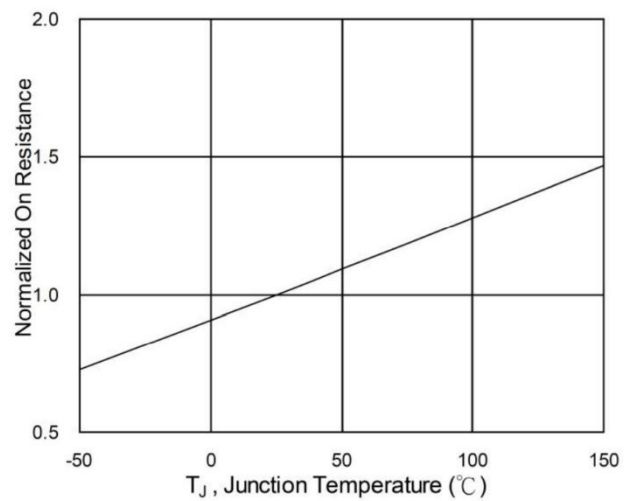
**Fig.3 Forward Characteristics of Reverse**



**Fig.4 Gate Charge Characteristics**

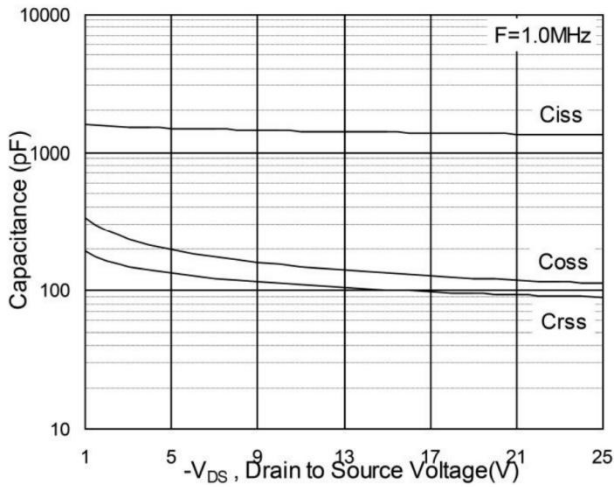


**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$**

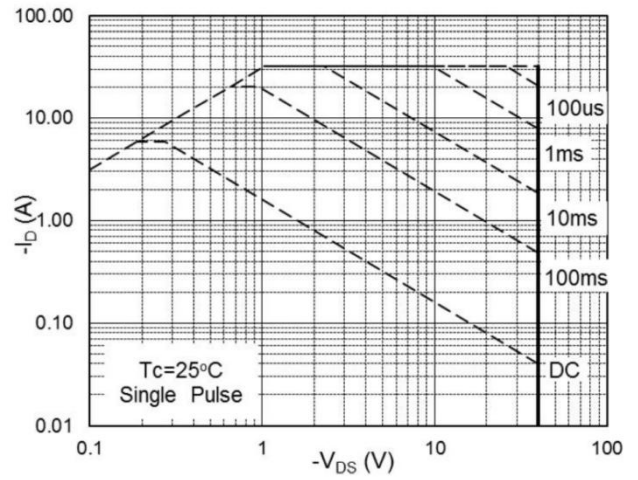


**Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$**

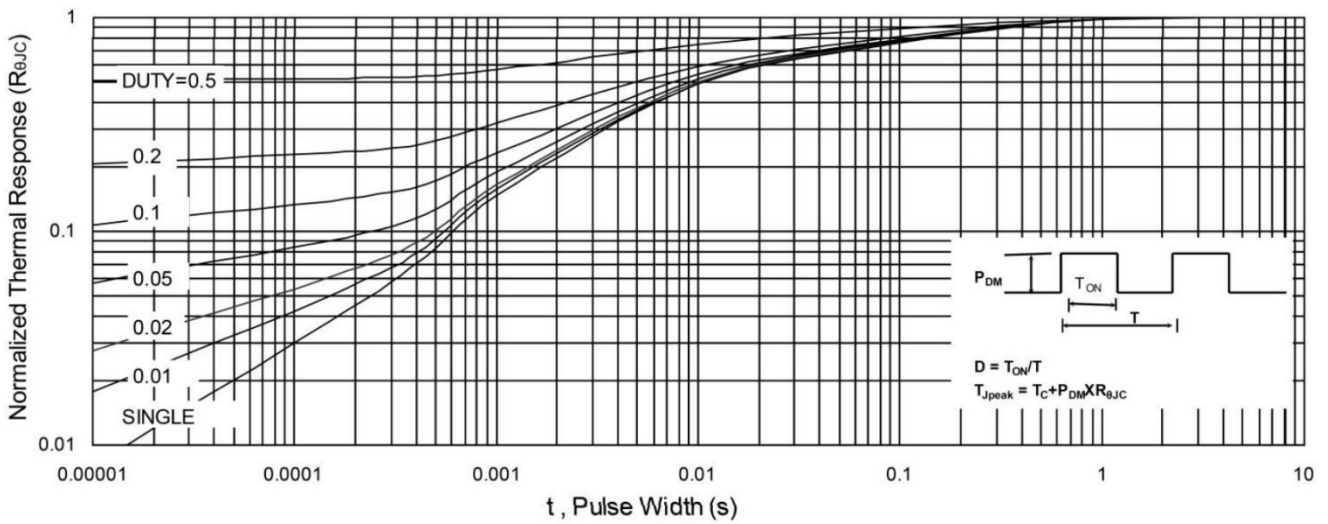
## Typical Characteristics



**Fig.7 Capacitance**

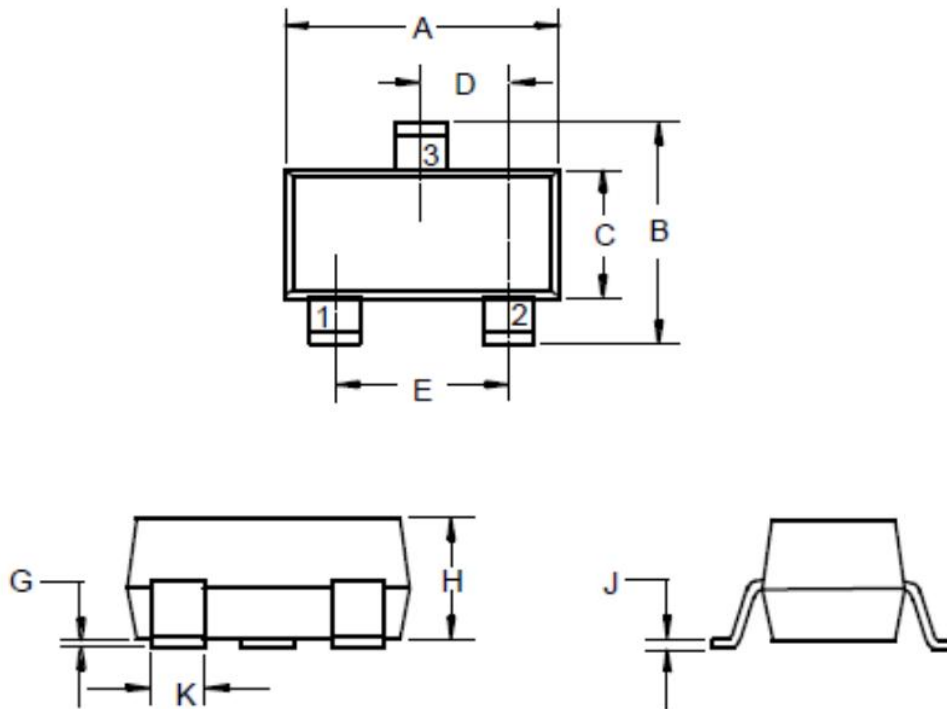


**Fig.8 Safe Operating Area**



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

### SOT-23-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.820	3.020	0.111	0.119
B	2.650	2.950	0.104	0.116
C	1.500	1.700	0.059	0.067
D	0.865	1.015	0.034	0.040
E	1.800	2.000	0.071	0.079
G	0.000	0.100	0.000	0.004
H	1.050	1.250	0.041	0.049
J	0.100	0.200	0.004	0.008
K	0.300	0.500	0.012	0.020