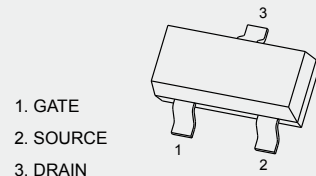


60V N-Channel Enhancement Mode MOSFET

$V_{(BR)DSS}$	$R_{DS(on)Typ}$	$I_D MAX$
60V	$0.9\Omega @ 10V$	500mA
	$1.1\Omega @ 4.5V$	

SOT-23



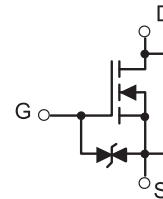
FEATURE

- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability
- HMB ESD protected (2000V)

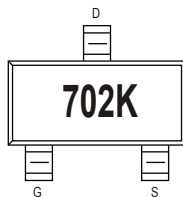
APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

Equivalent circuit



MARKING



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	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	0.5	A
Power Dissipation	P_D	0.3	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	400	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-50 ~ +150	

ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(TA=25°C)	$V_{DS}=60V, V_{GS}=0V$	--	--	1	μA
	Zero Gate Voltage Drain Current(TA=125°C)	$V_{DS}=50V, V_{GS}=0V$	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 10	μA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.6	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	$V_{GS}=10V, I_D=0.5A$	--	0.9	2	Ω
$R_{DS(ON)}$	Drain-Source On-State Resistance②	$V_{GS}=4.5V, I_D=0.3A$	--	1.4	3	Ω

Dynamic Electrical Characteristics

C_{iss}	Input Capacitance	$V_{DS}=30V, V_{GS}=0V,$ $f=1MHz$	--	23.8	--	pF
C_{oss}	Output Capacitance		--	3.9	--	pF
C_{rss}	Reverse Transfer Capacitance		--	1.5	--	pF
Q_g	Total Gate Charge	$V_{DS}=30V$ $I_D=0.5A,$ $V_{GS}=10V$	--	0.93	--	nC
Q_{gs}	Gate Source Charge		--	0.18	--	nC
Q_{gd}	Gate Drain Charge		--	0.31	--	nC

Switching Characteristics

$t_{d(on)}$	Turn on Delay Time	$V_{DD}=30V,$ $I_D=0.3A,$ $R_G=3.3\Omega,$ $V_{GS}=10V$	--	6	--	ns
t_r	Turn on Rise Time		--	3.5	--	ns
$t_{d(off)}$	Turn Off Delay Time		-	20	--	ns
t_f	Turn Off Fall Time		--	5.9	--	ns

Source Drain Diode Characteristics

I_{SD}	Source drain current(Body Diode)	$T_A=25^\circ C$	--	--	0.2	A
V_{SD}	Forward on voltage②	$T_j=25^\circ C, I_{SD}=0.5A,$ $V_{GS}=0V$	--	0.78	1.2	V

Notes:

① Pulse width limited by maximum allowable junction temperature

②Pulse test ; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Characteristics

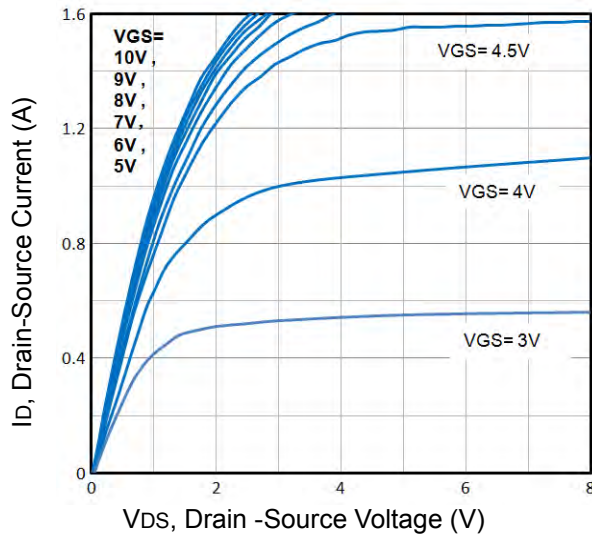


Fig1. Typical Output Characteristics

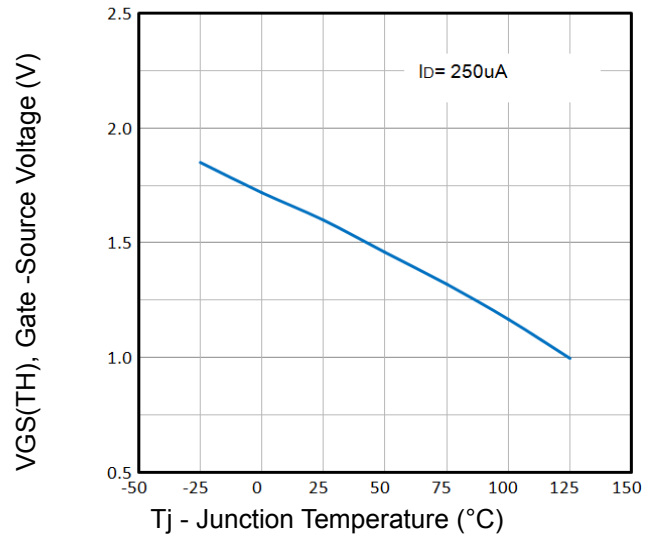


Fig2. Normalized Threshold Voltage Vs. Temperature

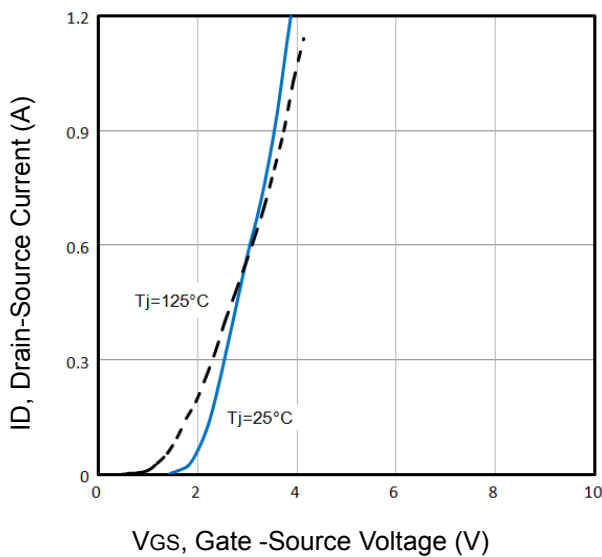


Fig3. Typical Transfer Characteristics

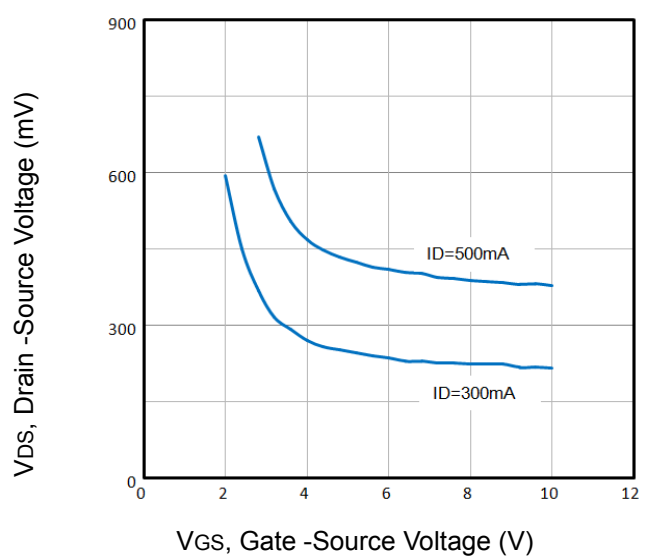


Fig4. Drain-Source Voltage vs Gate-Source Voltage

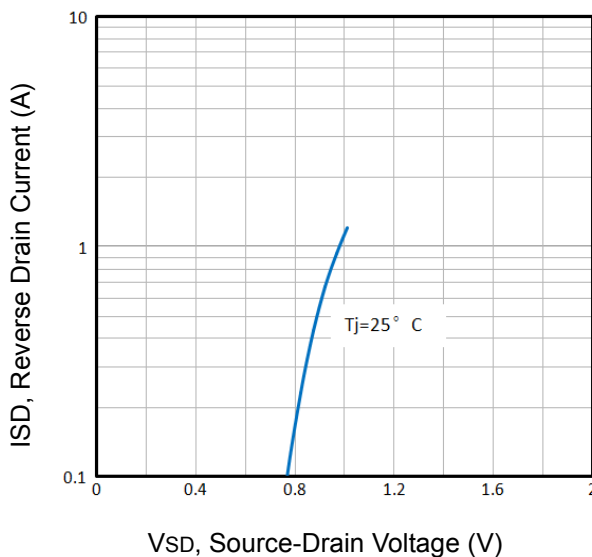


Fig5. Typical Source-Drain Diode Forward Voltage

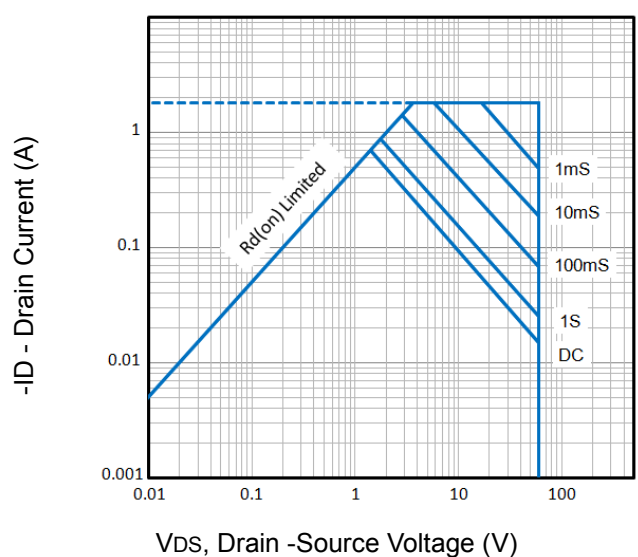


Fig6. Maximum Safe Operating Area

Typical Characteristics

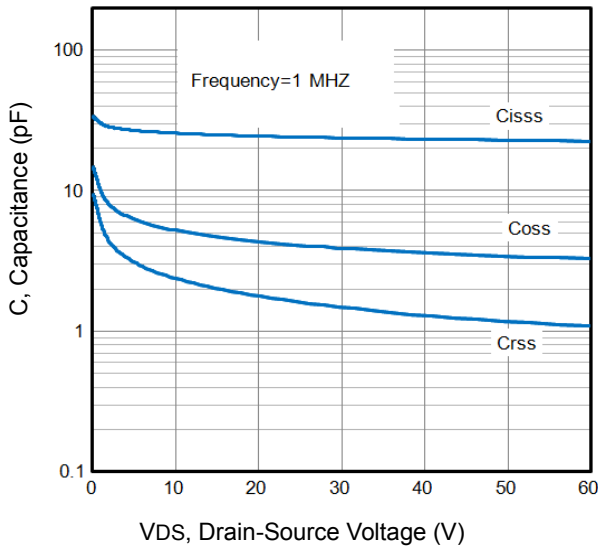


Fig7. Typical Capacitance Vs. Drain-Source Voltage

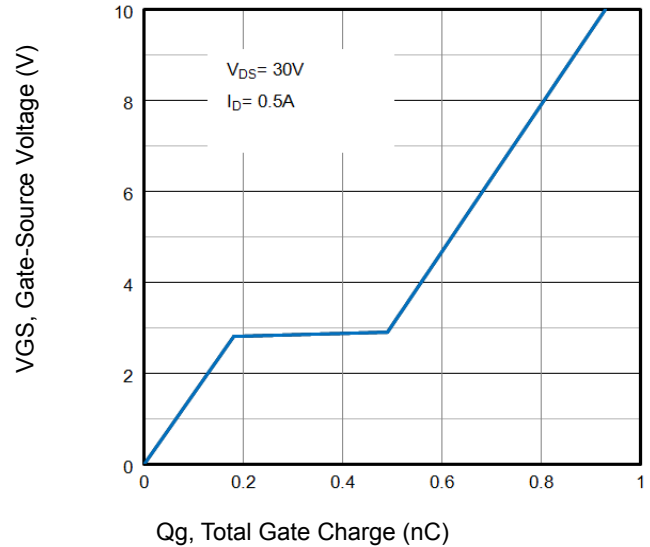


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

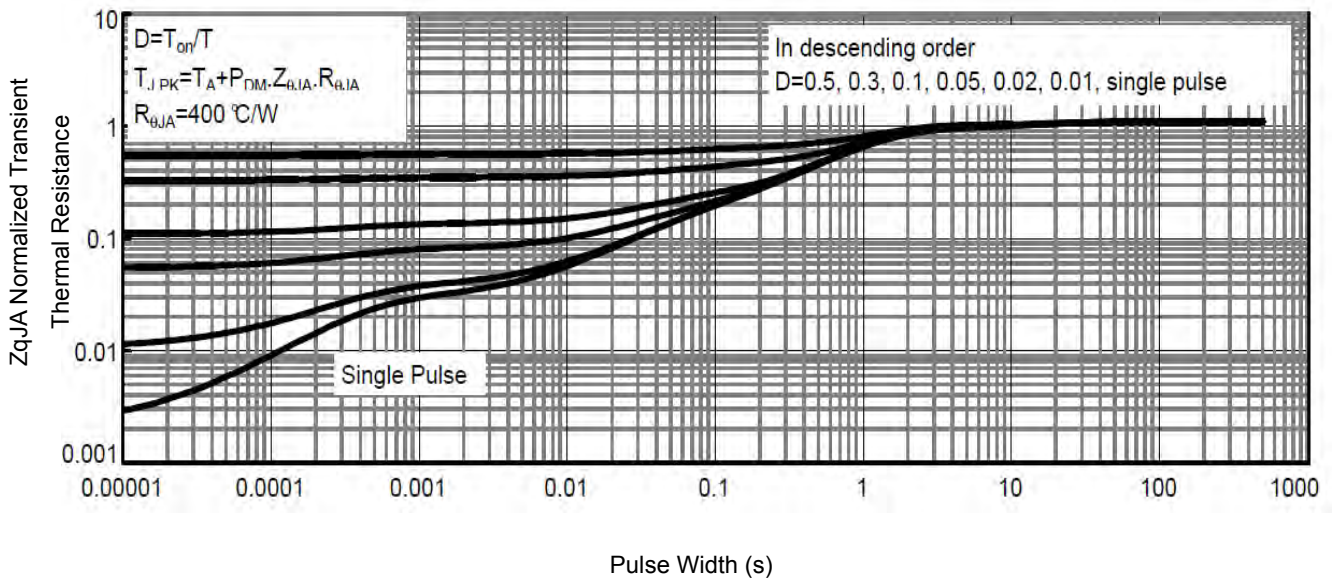


Fig9. Normalized Maximum Transient Thermal Impedance

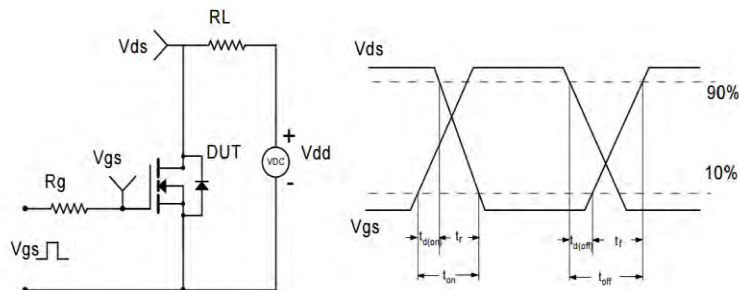
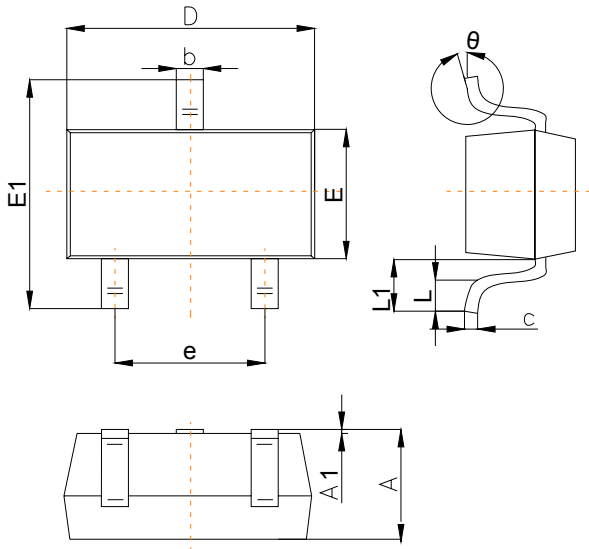


Fig10. Switching Time Test Circuit and waveforms

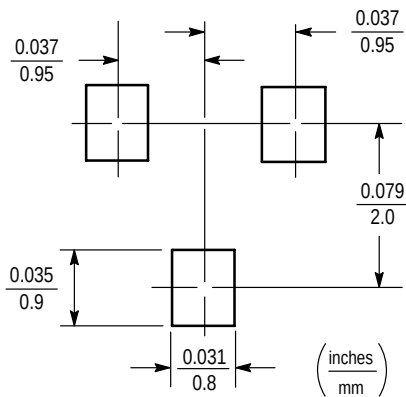
Outline Drawing

SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	1.00		1.40
A1			0.10
b	0.35		0.50
c	0.10		0.20
D	2.70	2.90	3.10
E	1.40		1.60
E1	2.4		2.80
e		1.90	
L	0.10		0.30
L1	0.4		
θ	0°		10°

Suggested Pad Layout



Note:

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