

Features

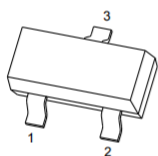
- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Low voltage drive (2.5V) makes this device ideal for portable equipment.
- 4) Drive circuits can be simple.
- 5) Parallel use is easy.
- 6) ESD protected 2KV HBM

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	2.5Ω@4.5V	0.1A
	3.0Ω@2.5V	

Applications

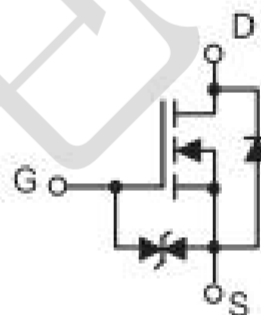
Interfacing, switching (30V, 100mA)

SOT-523



1. GATE
2. SOURCE
3. DRAIN

Equivalent Circuit



Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	30	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	Continuous	I_D	±100	mA
	Pulsed	I_{DP}^{*1}	±400	mA
Total power dissipation		P_D^{*2}	200	mW
Channel temperature		T_{ch}	150	°C
Storage temperature		T_{stg}	-55 to +150	°C

*1 $P_w \leq 10\mu s$, Duty cycle ≤ 1%

*2 With each pin mounted on the recommended lands.

Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to ambient	$R_{th(ch-a)}^{*}$	625	°C / W

*With each pin mounted on the recommended lands.

Electrical characteristics (Ta= 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10\mu A, V_{GS} = 0V$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 30V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	0.8	—	1.5	V	$V_{DS} = 3V, I_D = 100\mu A$
Static drain-source on-state resistance	$R_{DS(on)}$	—	—	8	Ω	$I_D = 10mA, V_{GS} = 4V$
	$R_{DS(on)}$	—	—	13	Ω	$I_D = 1mA, V_{GS} = 2.5V$
Forward transfer admittance	$ Y_{fs} $	20	—	—	mS	$V_{DS} = 3V, I_D = 10mA$
Input capacitance	C_{iss}	—	13	—	pF	$V_{DS} = 5V$
Output capacitance	C_{oss}	—	9	—	pF	$V_{GS} = 0V$
Reverse transfer capacitance	C_{rss}	—	4	—	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = 10mA, V_{DD} = 5V$
Rise time	t_r	—	35	—	ns	$V_{GS} = 5V$
Turn-off delay time	$t_{d(off)}$	—	80	—	ns	$R_L = 500\Omega$
Fall time	t_f	—	80	—	ns	$R_G = 10\Omega$

Electrical characteristic curves

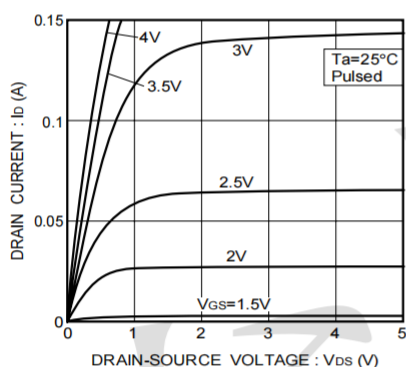


Fig.1 Typical output characteristics

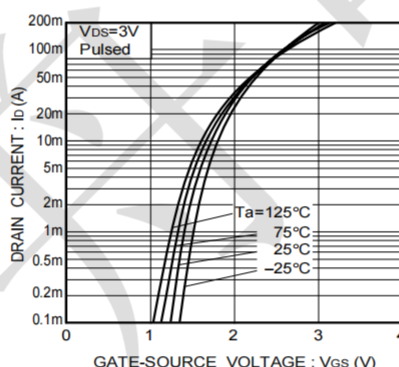


Fig.2 Typical transfer characteristics

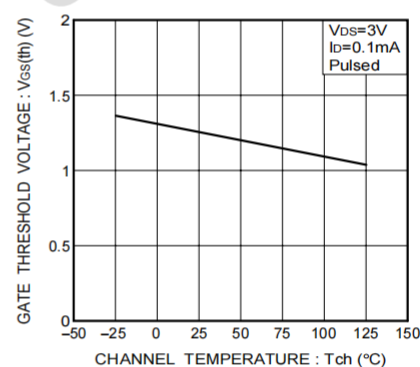


Fig.3 Gate threshold voltage vs. channel temperature

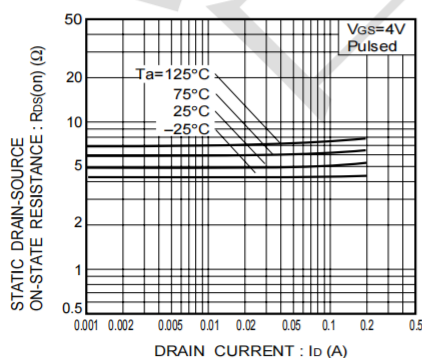


Fig.4 Static drain-source on-state resistance vs. drain current (I)

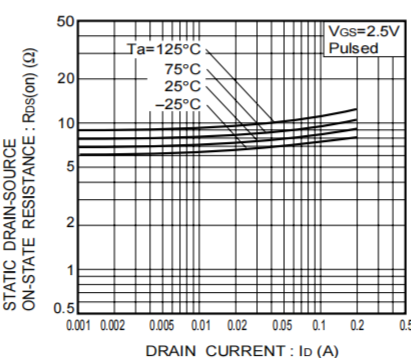


Fig.5 Static drain-source on-state resistance vs. drain current (II)

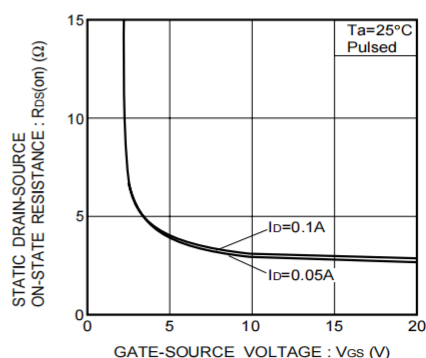


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

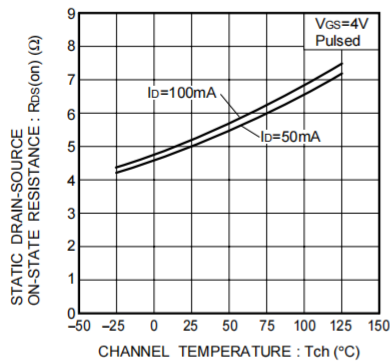


Fig.7 Static drain-source on-state resistance vs. channel temperature

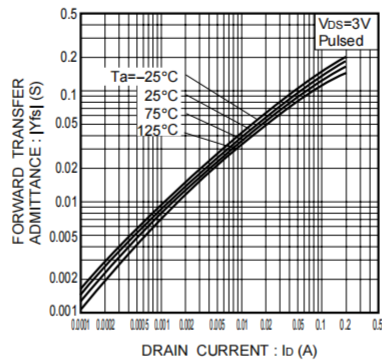


Fig.8 Forward transfer admittance vs. drain current

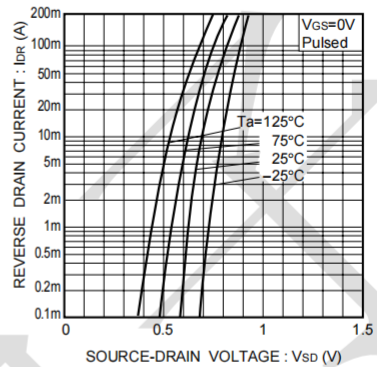


Fig.9 Reverse drain current vs. source-drain voltage (I)

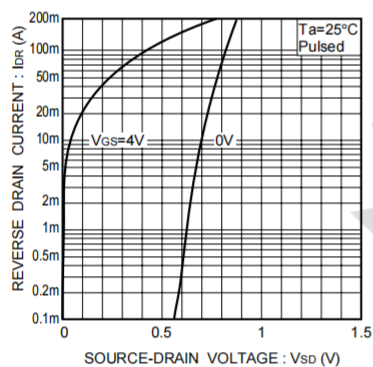


Fig.10 Reverse drain current vs. source-drain voltage (II)

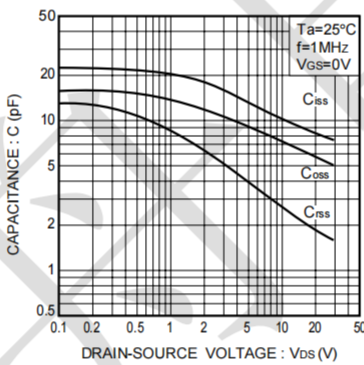


Fig.11 Typical capacitance vs. drain-source voltage

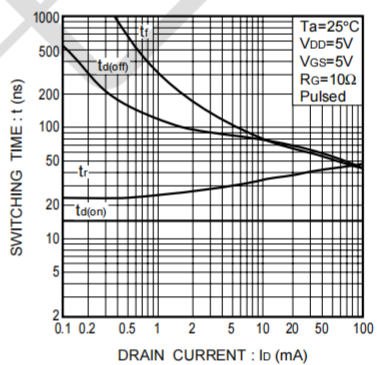


Fig.12 Switching characteristics (See Figures 13 and 14 for the measurement circuit and resultant waveforms)

Switching characteristics measurement circuit

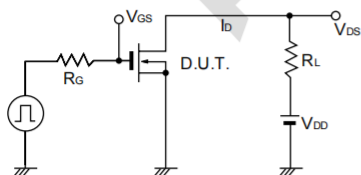


Fig.13 Switching time measurement circuit

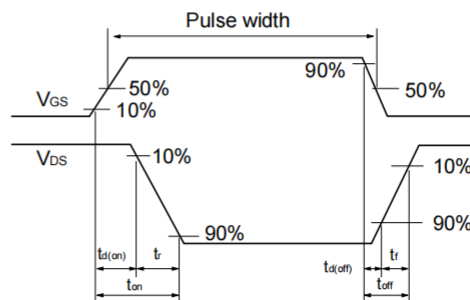
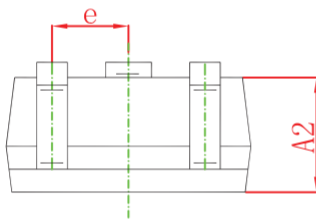
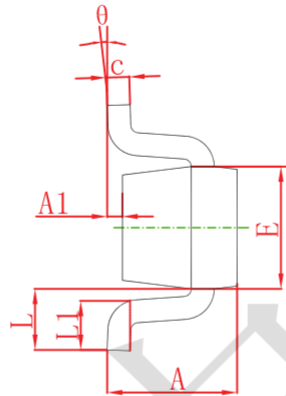
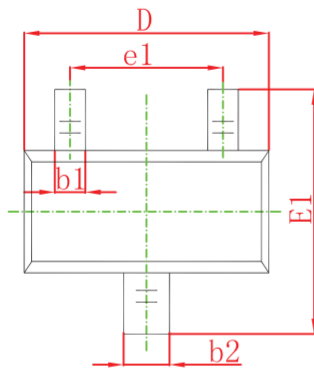


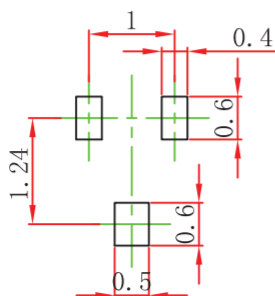
Fig.14 Switching time waveforms

SOT-523 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

SOT-523 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.