30V/25mΩ@10V N-Channel MOSFET

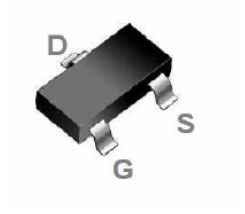
Features

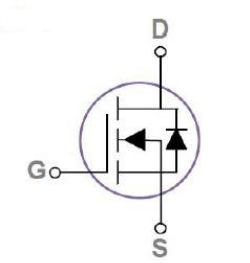
- VDS(max)=30V
- ID(max)=5.0A
- RDS(ON) <25mΩ(max)@VGS = 10V
- RDS(ON) <42mΩ(max)@VGS = 4.5V
- Improved dv/dt capability
- Green Device Available
- Fast switching

Applications

- MB / VGA / Vcore
- Hand-Held Instrument
- Load Switch

SOT23 Pin Configuration





Maximum Ratings (Tc = 25℃, Unless Otherwise Noted)

Parameters	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current - Continuous(TC=25℃)	I_D	5	A
Drain Current - Continuous(TC=100℃)		3.7	A
Drain Current - Pulsed	I_{DM}[1]	24	A
Single Pulse Avalanche Energy[2]	EAS	17.3	mJ
Single Pulse Avalanched Current[2]	IAS	12.1	A
Power Dissipation(TC=25℃)	P_D	1.56	W
Power Dissipation - Derate above 25℃		0.012	W/℃
Storage Temperature Range	T_{STG}	-55~ 150	℃
Operating Junction Temperature Range	Tj	-55~ 150	℃

Thermal Characteristics

Parameter	Symbol	Max.	Typ.	Unit
Thermal Resistance Junction to ambient	$R_{\theta JA}$	---	80	℃/W

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle< 0. 5%.
3. Essentially independent of operating temperature.

Electrical Characteristics(Tj = 25℃, Unless Otherwise Noted)

Off Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain to Source Breakdown Volage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃, I_D=1mA	---	0.04	---	V/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V, T_J=25℃	---	---	1	μA
		V_{DS}=24V, V_{GS}=0V, T_J=125℃	---	---	10	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}= ±20V	---	---	±100	nA

On Characteristics

Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=4A	---	20	25	mΩ
		V_{GS}=4.5V, I_D=2A	---	28	42	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2	1.7	2.1	V
VGS(th) Temperature Cofficient	$\triangle V_{GS(th)}$		---	-4	---	mV/℃
Forward Transconductance	gfs	V_{DS}=10V,I_S=4A	---	6.5	---	S

Dynamic And Switching Characteristics

Total Gate Charge[2,3]	Q_g	V_{DS}=15V,V_{GS}=4.5V, I_D=3A	---	3.7	7	nC
Gate-Source Charge[2,3]	Q_{gs}		---	1.48	3	
Gate-Drain Charge[2,3]	Q_{gd}		---	1.56	3.5	
Turn-on Delay Time[2,3]	$T_{d(on)}$	V_{DD}=15V,I_D=1A V_{GS}=10V,R_{GEN}=6Ω	---	2.6	5	nS
Turn-on Rise Time[2,3]	T_r		---	8.8	16	
Turn-off Delay Time[2,3]	$T_{d(off)}$		---	18.4	35	
Turn-off Fall Time[2,3]	T_f		---	5.1	10	
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,F =1MHz	---	293	520	pF
Output Capacitance	C_{oss}		---	57	100	
Reverse Transfer Capacitance	C_{rss}		---	40	80	
Gate resistance	Rg	V_{GS}=0V,V_{DS}=0V,F= 1MHz	---	1.15	3	Ω

Drain-Source Diode Characteristics And Maximum Ratings

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	---	---	5.0	A
Pulsed Source Current	I_{SM}		---	---	24	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25℃	---	---	1	V

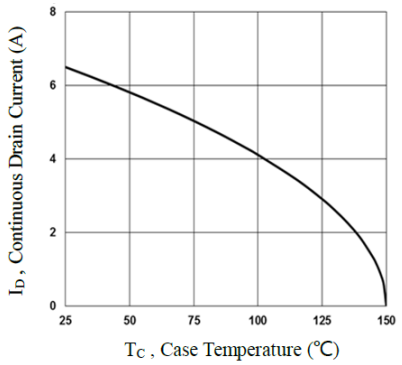


Fig.1 Continuous Drain Current vs. T_C

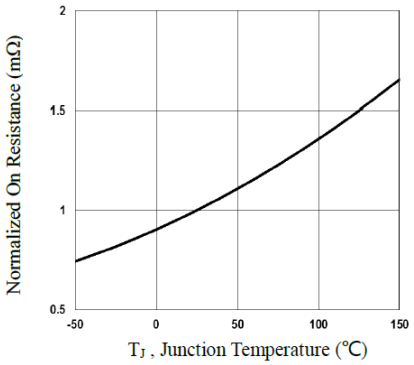


Fig.2 Normalized RDSON vs. T_J

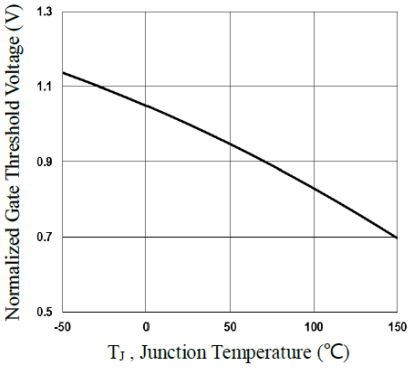


Fig.3 Normalized V_{th} vs. T_J

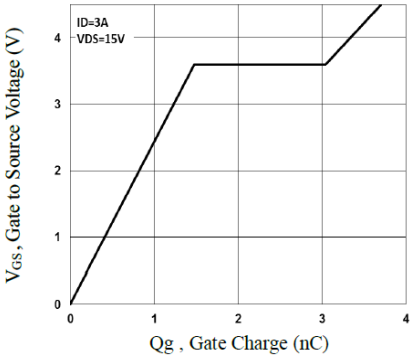


Fig.4 Gate Charge Waveform

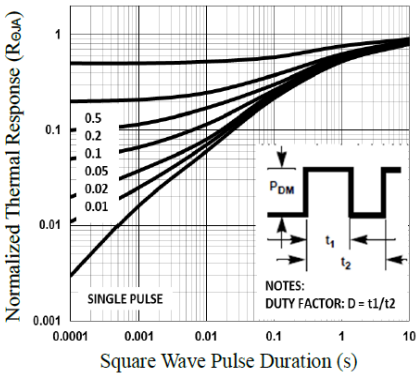


Fig.5 Normalized Transient Response

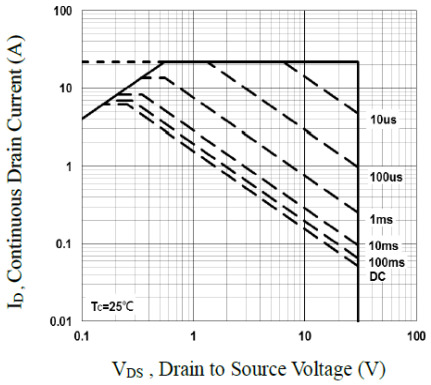


Fig.6 Maximum Safe Operation Area

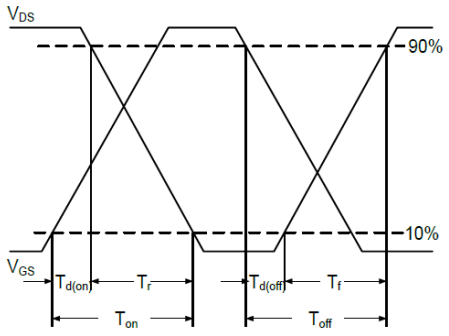


Fig.7 Switching Time Waveform

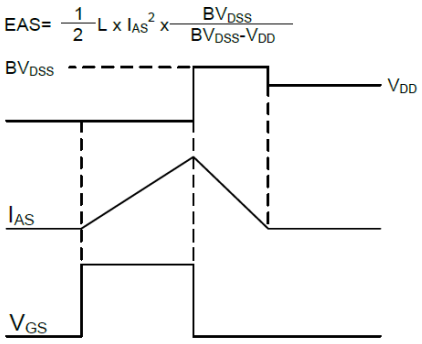
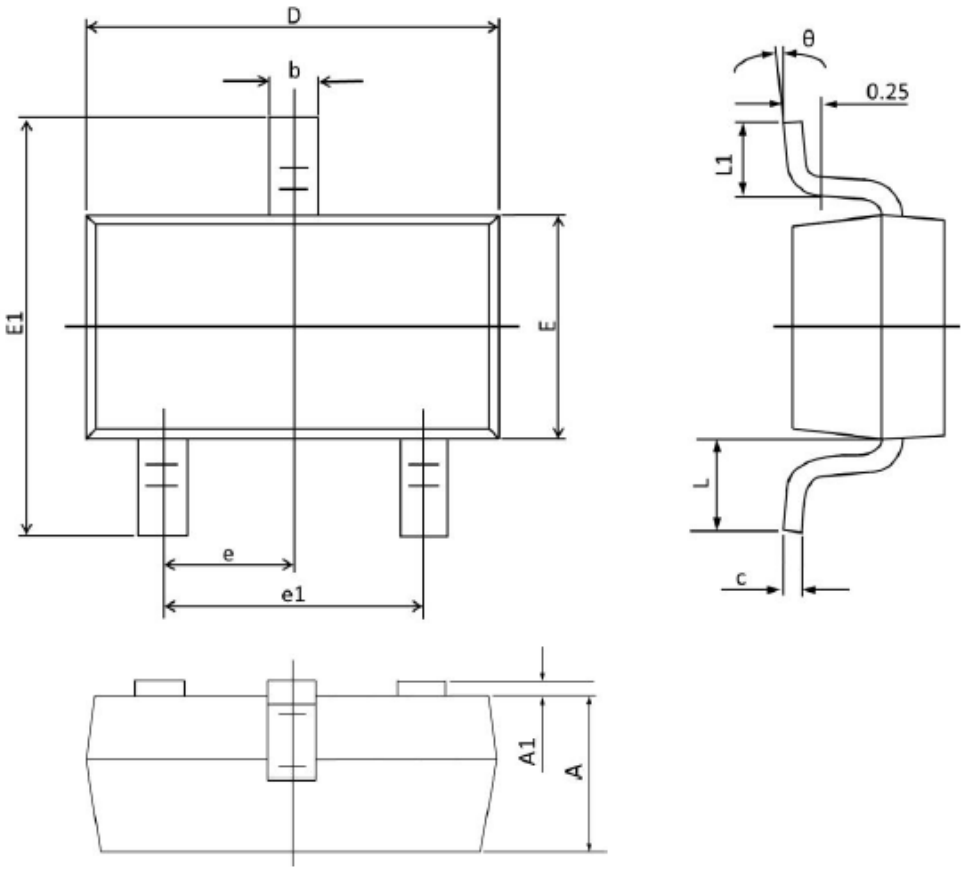


Fig.8 EAS Waveform

SOT23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°