YEA SHIN TECHNOLOGY CO., LTD

YS3912K

N-Channel Enhancement MOSFET

VDS= 30V, ID= 7.5A

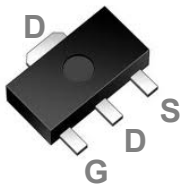
Features

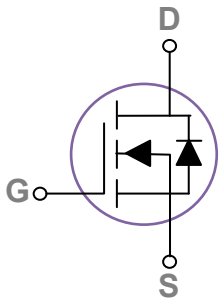
- *30V,7.5A, RDS(ON) =24mΩ @VGS = 10V*
- *Improved dv/dt capability*
- *Fast switching*
- *100% EAS Guaranteed*
- *Green Device Available*

Applications

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

SOT-89 Pin Configuration





Absolute Maximum Rating T_C=25℃ **unless otherwise noted**

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	7.5	A
	Drain Current – Continuous (T_C=100℃)	4.74	A
I_{DM}	Drain Current – Pulsed[1]	30	A
EAS	Single Pulse Avalanche Energy[2]	32	mJ
IAS	Single Pulse Avalanche Current[2]	8	A
P_D	Power Dissipation (T_C=25℃)	4.1	W
	Power Dissipation – Derate above 25℃	0.033	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics T_J=25℃ **unless otherwise noted**

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

DEVICE CHARACTERISTICS

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Electrical Characteristics (T_J=25℃, unless otherwise)

Off Characteristics

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

On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance[3]	V_{GS}=10V, I_D=6A	---	19	24	mΩ
		V_{GS}=4.5V, I_D=4A	---	25	34	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250uA	1.2	1.6	2.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V, I_D=4A	---	6.5	---	S

Dynamic and Switching Characteristics

Q_g	Total Gate Charge[3,4]	V_{DS}=15V, V_{GS}=4.5V, I_D=6A	---	8.4	12	nC
Q_{gs}	Gate-Source Charge[3,4]		---	1	2	
Q_{gd}	Gate-Drain Charge[3,4]		---	2.2	4	
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=15V, V_{GS}=10V, R_G=6 Ω, I_D=1A	---	4.5	9	ns
T_r	Rise Time[3,4]		---	13	25	
$T_{d(off)}$	Turn-On Delay Time[3,4]		---	27	51	
T_f	Fall Time[3,4]		---	8.3	16	
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	695	1000	pF
C_{oss}	Output Capacitance		---	45	65	
C_{rss}	Reverse Transfer Capacitance		---	36	50	
Rg	Gate Resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	---	3.2	6.4	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V, Force Current	---	---	7.5	A
I_{SM}	Pulsed Source Current[3]		---	---	15	A
V_{SD}	Diode Forward Voltage[3]	V_{GS}=0V, I_S=1A, T_J=25℃	---	---	1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=1mH,I_{AS}=8A.,R_G=25Ω,Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

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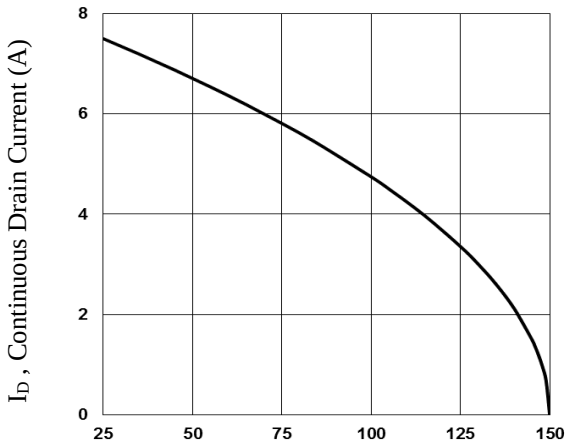

Fig.1 Continuous Drain Current vs. T_C

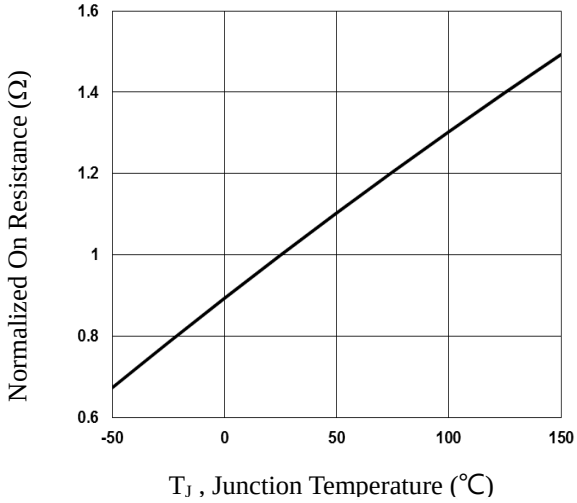

Fig.2 Normalized RDSON vs. T_J

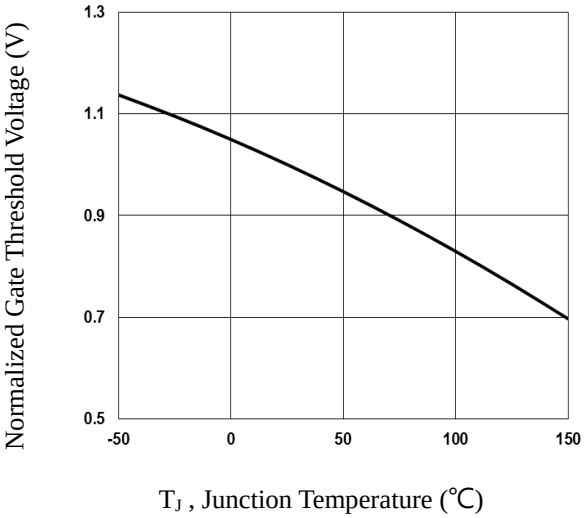

Fig.3 Normalized V_{th} vs. T_J

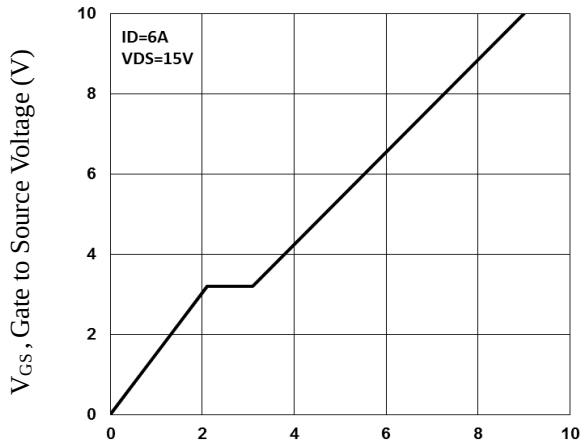

Fig.4 Gate Charge Waveform

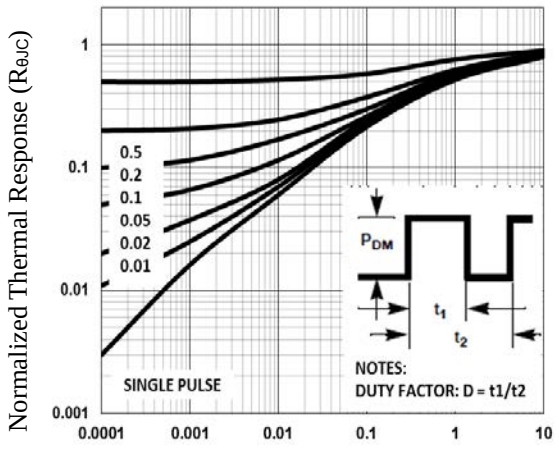

Fig.5 Normalized Transient Impedance

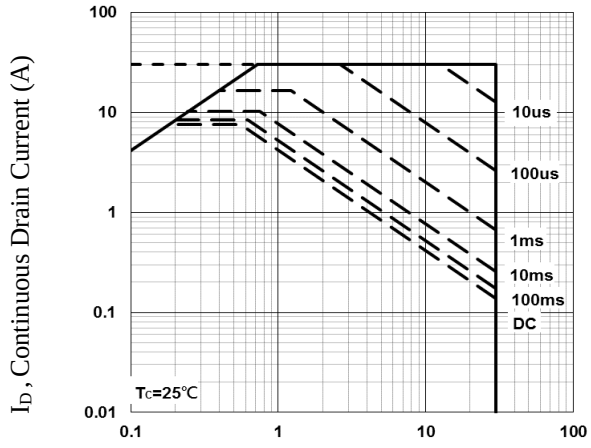

Fig.6 Maximum Safe Operation Area

DEVICE CHARACTERISTICS

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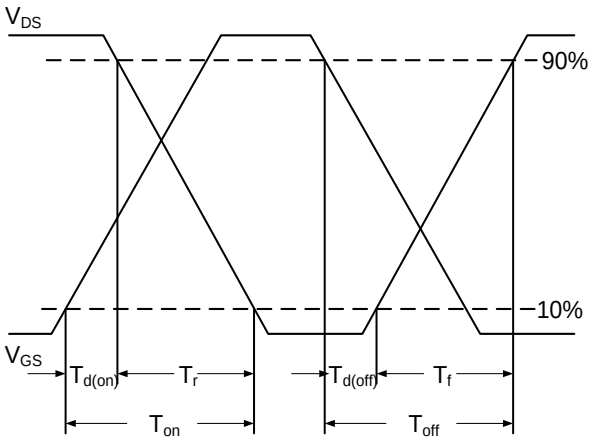


Fig.7 Switching Time Waveform

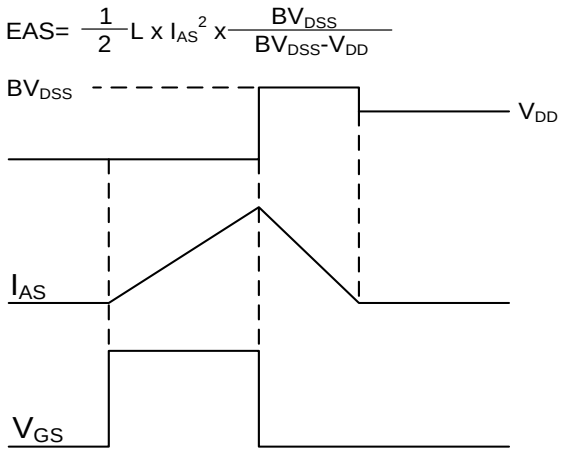
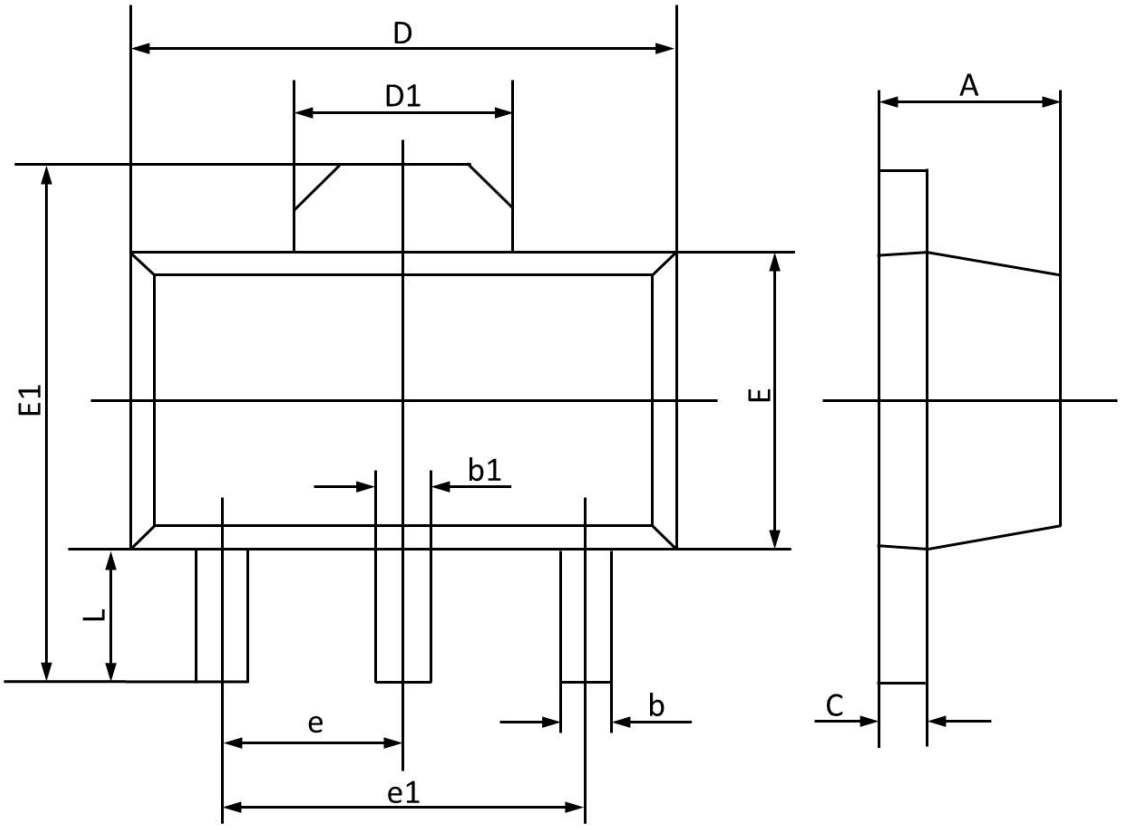


Fig.8 EAS Waveform

PACKAGE OUTLINE & DIMENSIONS

YS3912K

SOT-89 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047