



YEA SHIN TECHNOLOGY CO., LTD

YS03N20L

N-Channel Enhancement MOSFET

VDS= 200V, ID= 3A



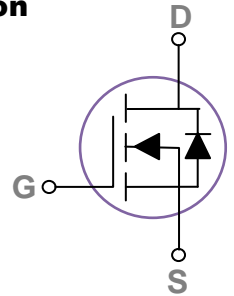
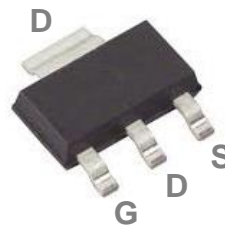
Features

- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- High efficient switched mode power supplies
- TV Power
- Adapter/charger
- Server Power
- Networking

SOT-223 Pin Configuration



Absolute Maximum Rating $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	200	V
V _{GS}	Gate-Source Voltage	±30	V
I _D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	3	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	1.9	A
I _{DM}	Drain Current – Pulsed ¹	12	A
P _D	Power Dissipation ($T_c=25^\circ\text{C}$)	1.78	W
	Power Dissipation – Derate above 25°C	0.014	W/ $^\circ\text{C}$
T _{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T _J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	70	$^\circ\text{C}/\text{W}$
R _{θJC}	Thermal Resistance Junction to Case	---	20	$^\circ\text{C}/\text{W}$

DEVICE CHARACTERISTICS

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Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	200	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	0.5	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=200V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=160V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance ²	$V_{GS}=10V, I_D=2A$	---	0.7	0.85	Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	3	4	5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-8	---	$mV/^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=2A$	---	3.6	---	S

Dynamic and Switching Characteristics

Q_g	Total Gate Charge ^{2,3}	$V_{DS}=160V, V_{GS}=10V, I_D=1A$	---	4.8	9	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	2	4	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	0.8	2	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=100V, V_{GS}=10V, R_G=25\Omega, I_D=1A$	---	10	20	ns
T_r	Rise Time ^{2,3}		---	35	70	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	10	20	
T_f	Fall Time ^{2,3}		---	28	56	
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	---	266	500	pF
C_{oss}	Output Capacitance		---	160	300	
C_{rss}	Reverse Transfer Capacitance		---	55	110	
R_g	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	---	1.5	3	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	---	---	3	A
I_{SM}	Pulsed Source Current ²		---	---	6	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

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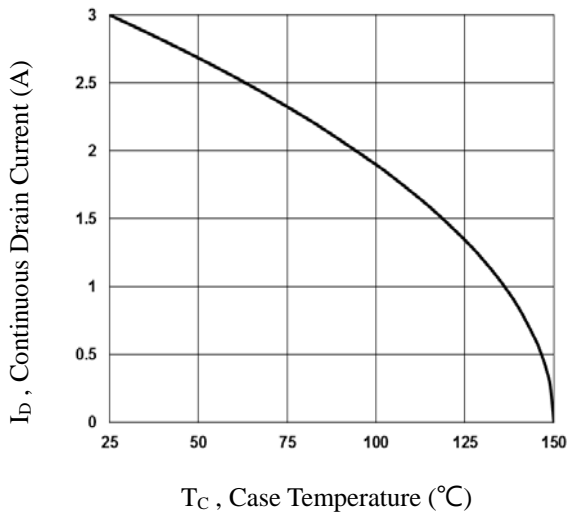


Fig.1 Continuous Drain Current vs. T_C

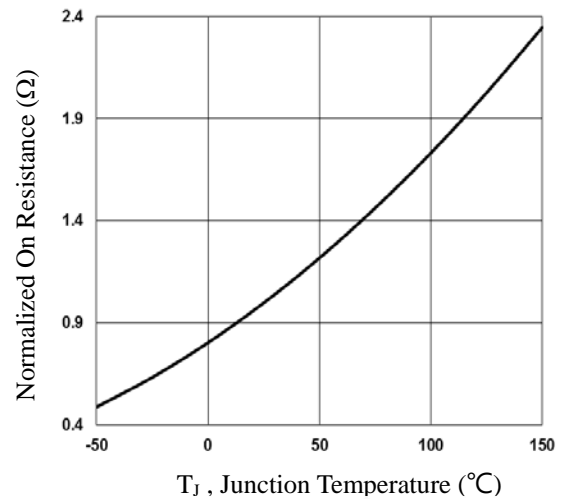


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

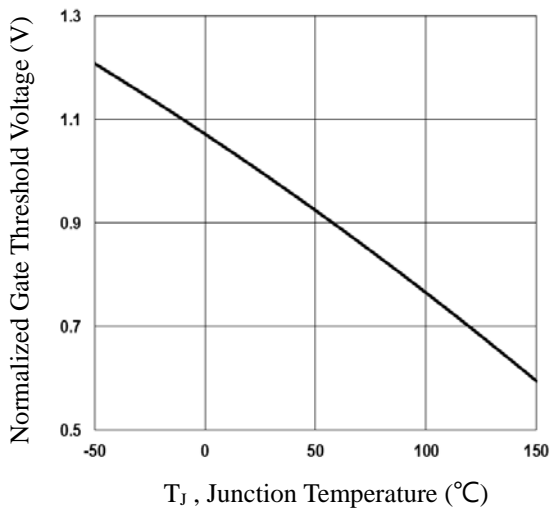


Fig.3 Normalized V_{th} vs. T_J

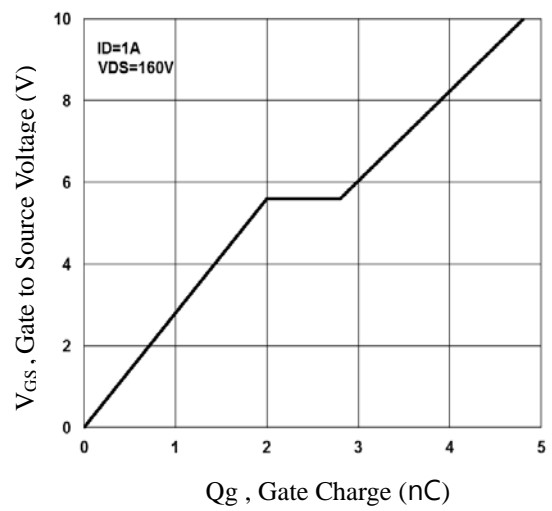


Fig.4 Gate Charge Waveform

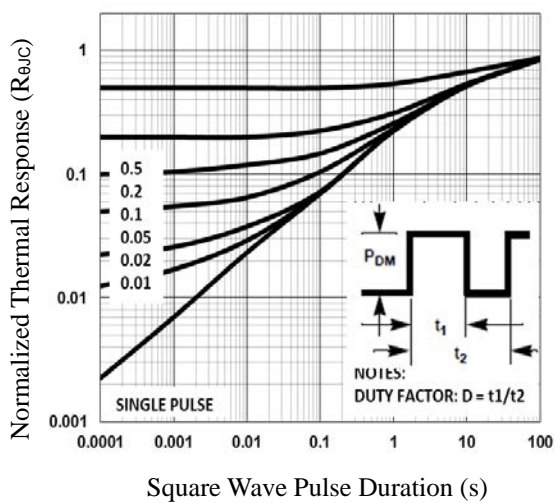


Fig.5 Normalized Transient Impedance

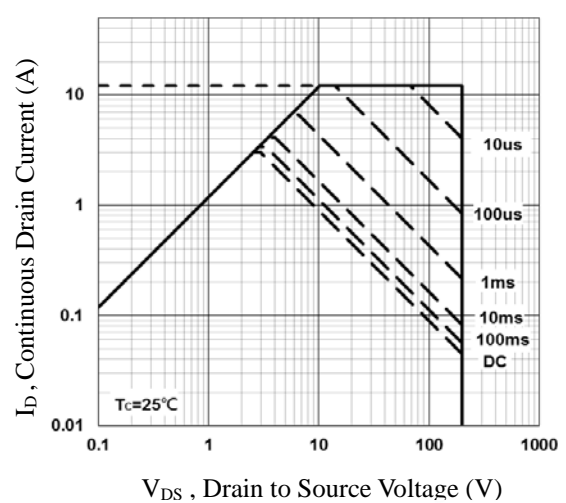


Fig.6 Maximum Safe Operation Area

DEVICE CHARACTERISTICS

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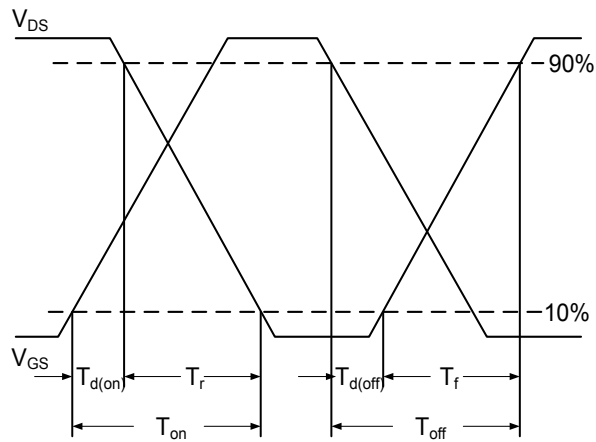


Fig.7 Switching Time Waveform

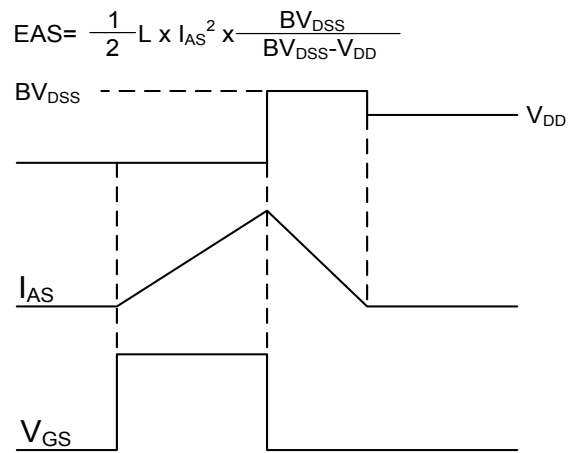
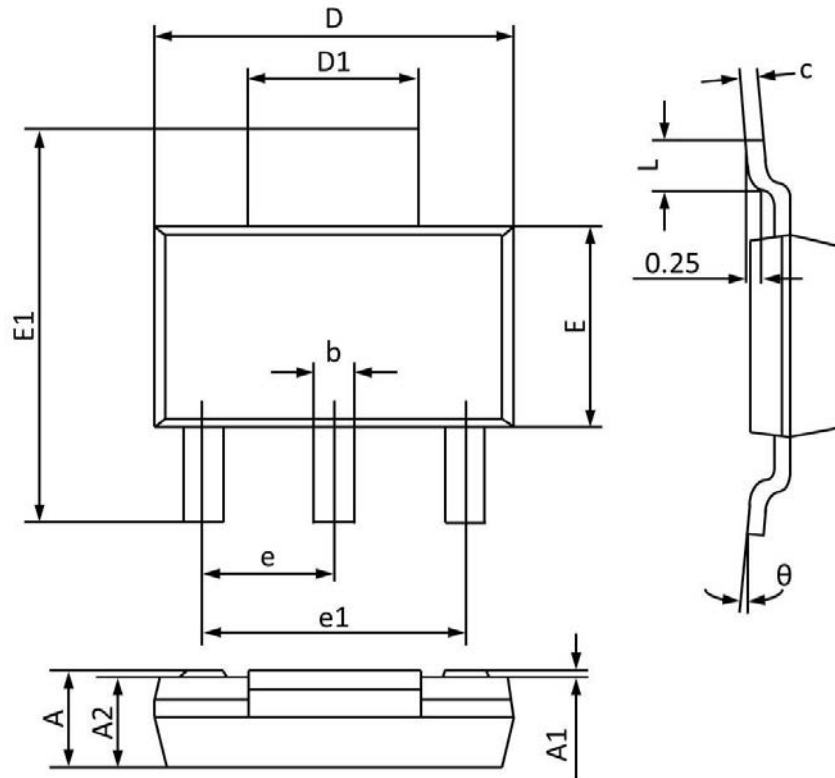


Fig.8 EAS Waveform

PACKAGE OUTLINE & DIMENSIONS

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SOT-223 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300 (BSC)		0.091 (BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°