YEA SHIN TECHNOLOGY CO., LTD

YS10N20L

N-Channel Enhancement MOSFET

VDS= 200V, ID=5A

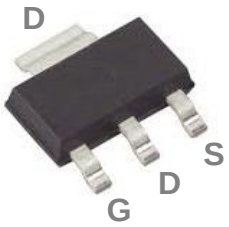
Features

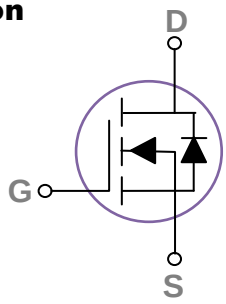
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*

Applications

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

SOT-223 Pin Configuration





Absolute Maximum Rating Tc=25℃ 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 (Tc=25℃)	5	A
	Drain Current – Continuous (Tc=100℃)	3.1	A
I_{DM}	Drain Current – Pulsed[1]	20	A
P_D	Power Dissipation (Tc=25℃)	8.3	W
	Power Dissipation – Derate above 25℃	0.66	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	70	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	15	℃/W

DEVICE CHARACTERISTICS

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Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

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

On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance[2]	V_{GS}=10V, I_D=4A	---	0.4	0.46	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250uA	3	4	5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-8	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V, I_D=2A	---	3.6	---	S

Dynamic and Switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=100V, V_{GS}=10V, I_D=5A	---	9.4	18	nC
Q_{gs}	Gate-Source Charge[2,3]		---	2.5	5	
Q_{gd}	Gate-Drain Charge[2,3]		---	3.7	7	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=100V, V_{GS}=10V, R_G=25Ω, I_D=1A	---	22	44	ns
T_r	Rise Time[2,3]		---	78	160	
$T_{d(off)}$	Turn-On Delay Time[2,3]		---	20	40	
T_f	Fall Time[2,3]		---	56	120	
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	337	500	pF
C_{oss}	Output Capacitance		---	58	100	
C_{rss}	Reverse Transfer Capacitance		---	33	60	
R_g	Gate Resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	---	3	6	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	---	---	5	A
I_{SM}	Pulsed Source Current[2]		---	---	10	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V, I_S=1A, T_J=25℃	---	---	1	V

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

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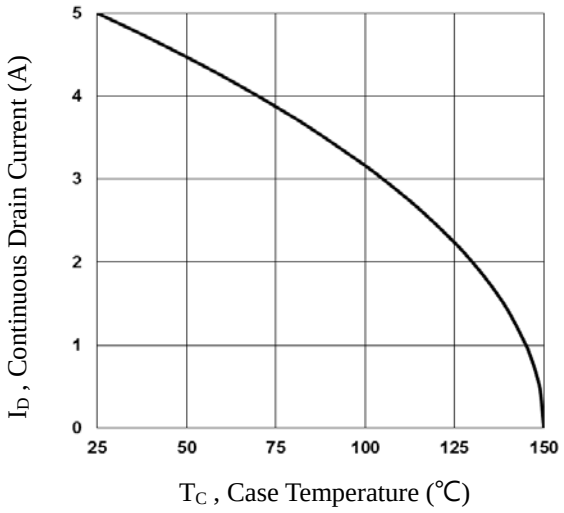

Fig.1 Continuous Drain Current vs. T_C

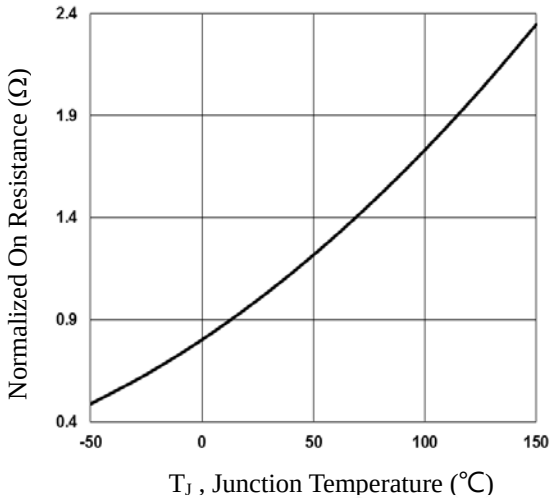

Fig.2 Normalized RDSON vs. T_J

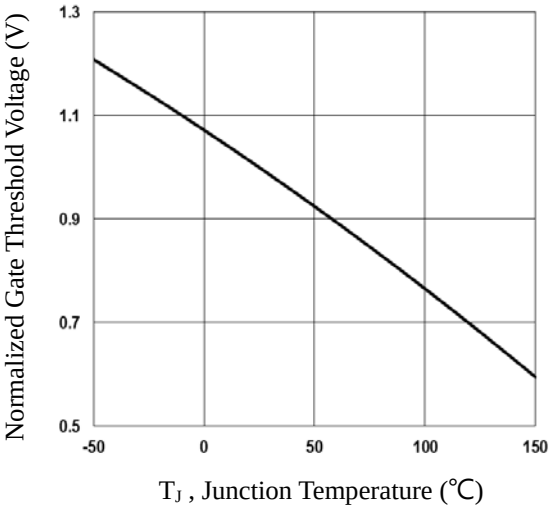

Fig.3 Normalized V_{th} vs. T_J

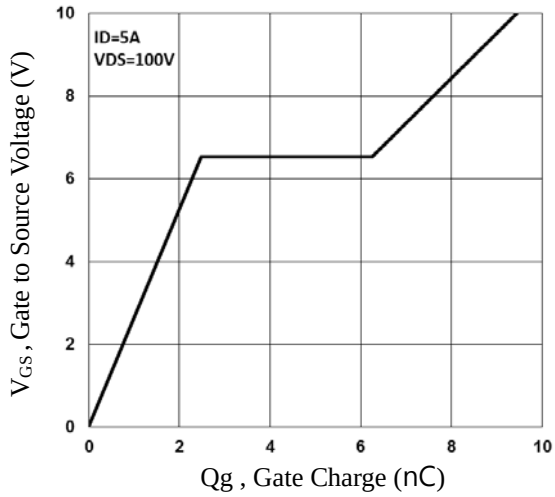

Fig.4 Gate Charge Waveform

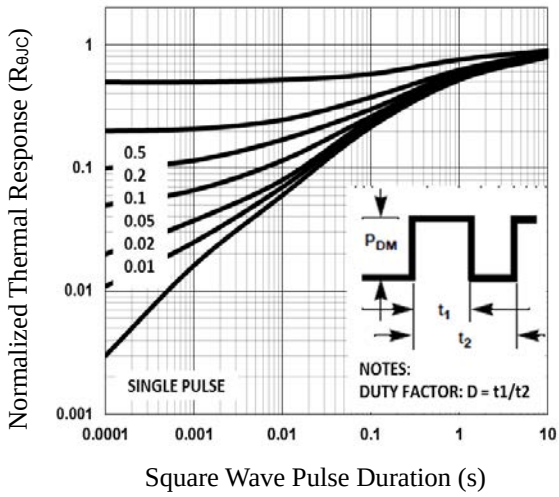

Fig.5 Normalized Transient Impedance

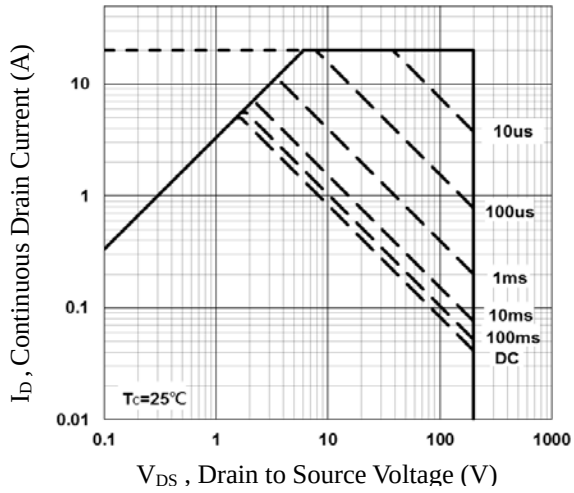

Fig.6 Maximum Safe Operation Area

DEVICE CHARACTERISTICS

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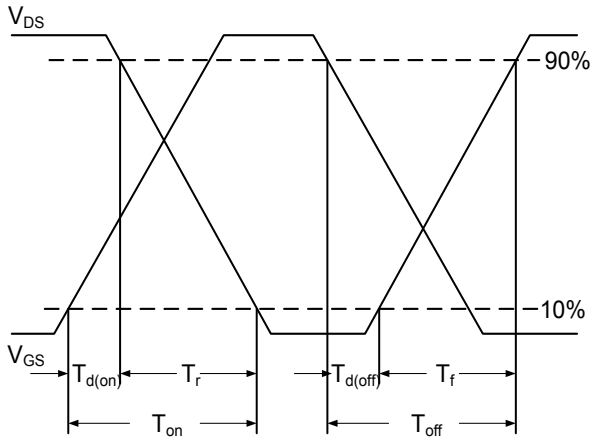


Fig.7 Switching Time Waveform

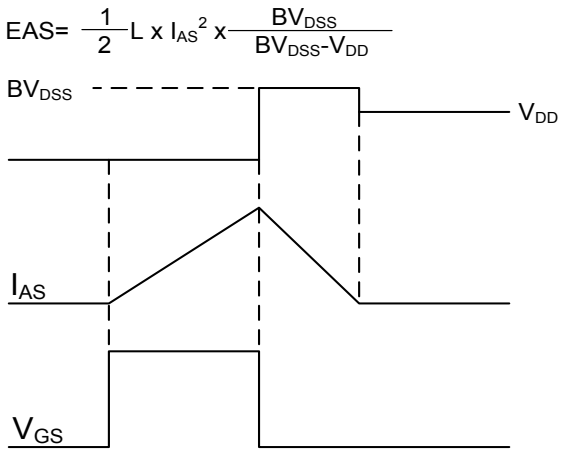
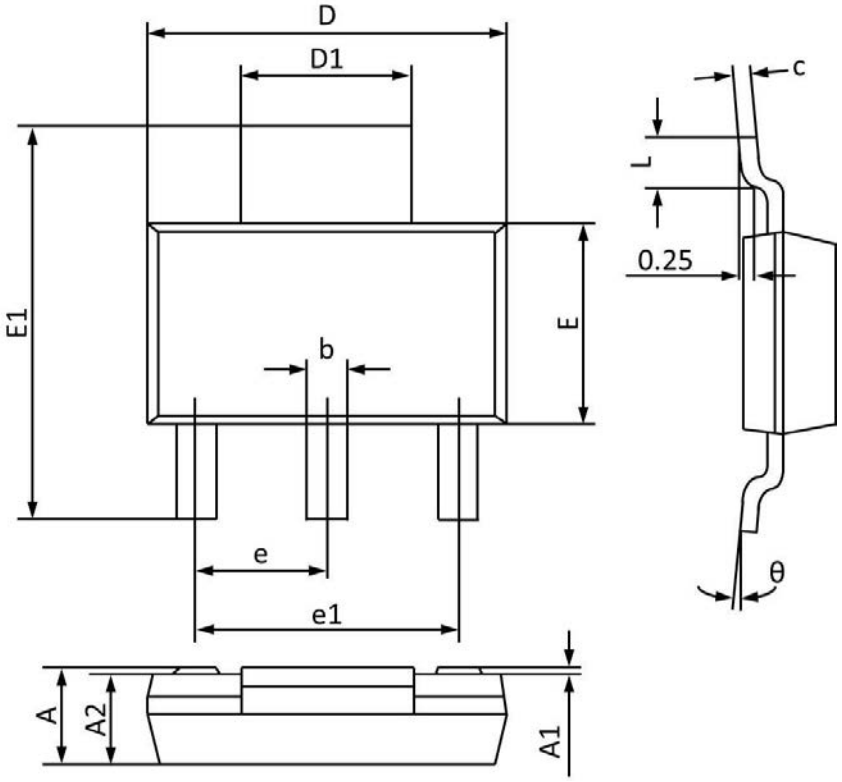


Fig.8 EAS Waveform

PACKAGE OUTLINE & DIMENSIONS

YS10N20L

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°