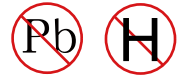




YEA SHIN TECHNOLOGY CO., LTD

YSE2320WKL

N-Channel Enhancement MOSFET



VDS= 20V, ID= 0.5A

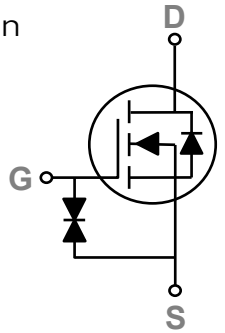
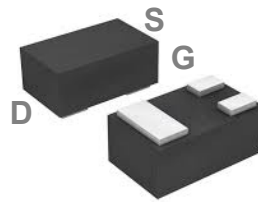
Features

- 20V,500mA, $R_{DS(ON)} = 350m\Omega @ V_{GS} = 4.5V$
- Worldwide Smallest Package : 1x0.6x0.45 mm
- Fast switching
- Green Device Available
- Suit for 1.2V Gate Drive Applications
- 2KV HBM ESD Capability

Applications

- Notebook
- Smartphone
- Battery Protection
- Hand-held Instruments

SOT-883 Pin Configuration



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

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	20	V
V _{GS}	Gate-Source Voltage	±8	V
I _D	Drain Current – Continuous ($T_c=25^\circ C$)	500	mA
	Drain Current – Continuous ($T_c=100^\circ C$)	320	mA
I _{DM}	Drain Current – Pulsed ¹	1	A
P _D	Power Dissipation ($T_c=25^\circ C$)	1.55	mW
	Power Dissipation – Derate above 25°C	1.25	mW/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	800	°C/W

DEVICE CHARACTERISTICS

YSE2320WKL

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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	-0.01	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=16V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 8V, V_{DS}=0V$	---	---	± 20	μA

On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance ²	$V_{GS}=4.5V, I_D=0.5A$	---	200	350	$m\Omega$
		$V_{GS}=2.5V, I_D=0.4A$	---	235	450	$m\Omega$
		$V_{GS}=1.8V, I_D=0.2A$	---	295	600	$m\Omega$
		$V_{GS}=1.5V, I_D=0.1A$	---	365	800	$m\Omega$
		$V_{GS}=1.2V, I_D=0.1A$	---	600	1500	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.3	0.5	0.8	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	3	---	$mV/^\circ\text{C}$

Dynamic and Switching Characteristics

Q_g	Total Gate Charge ^{2,3}	$V_{DS}=10V, V_{GS}=4.5V, I_D=0.5A$	---	1	2	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	0.26	0.5	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	0.2	0.4	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=10V, V_{GS}=4.5V, R_G=10\Omega, I_D=0.5A$	---	5	10	ns
T_r	Rise Time ^{2,3}		---	3.5	7	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	14	28	
T_f	Fall Time ^{2,3}		---	6	12	
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$	---	38.2	75	pF
C_{oss}	Output Capacitance		---	24.4	28	
C_{rss}	Reverse Transfer Capacitance		---	6	12	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	500	mA
I_{SM}	Pulsed Source Current ²		---	---	1000	mA
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=0.2A, T_J=25^\circ\text{C}$	---	---	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.

DEVICE CHARACTERISTICS

YSE2320WKL

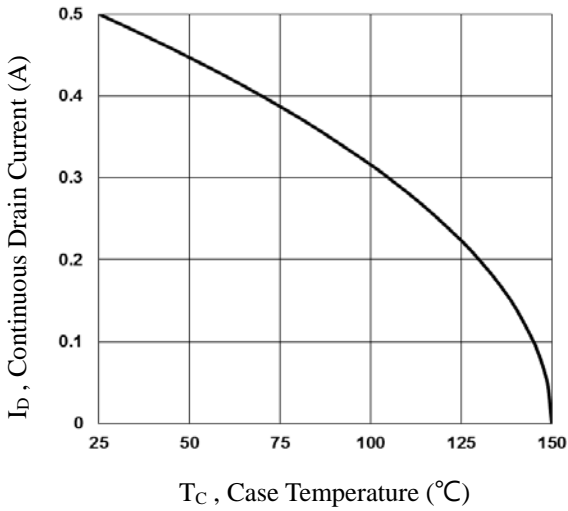


Fig.1 Continuous Drain Current vs. T_c

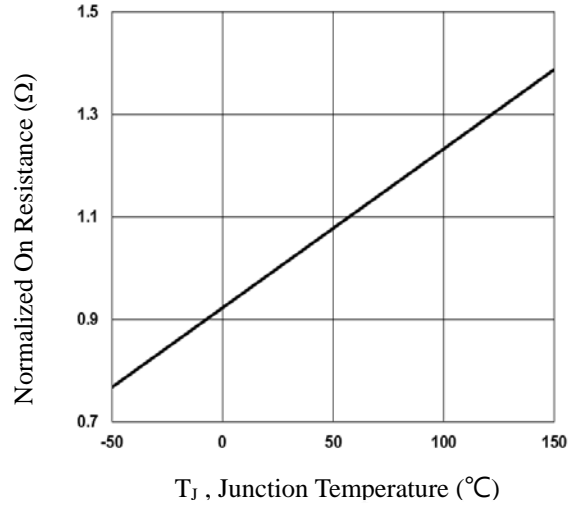


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

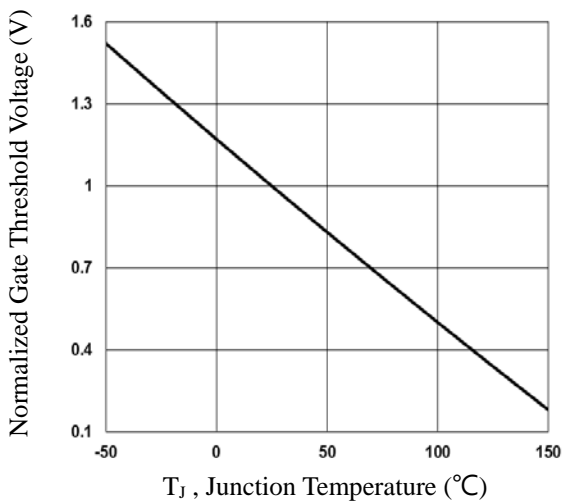


Fig.3 Normalized V_{th} vs. T_j

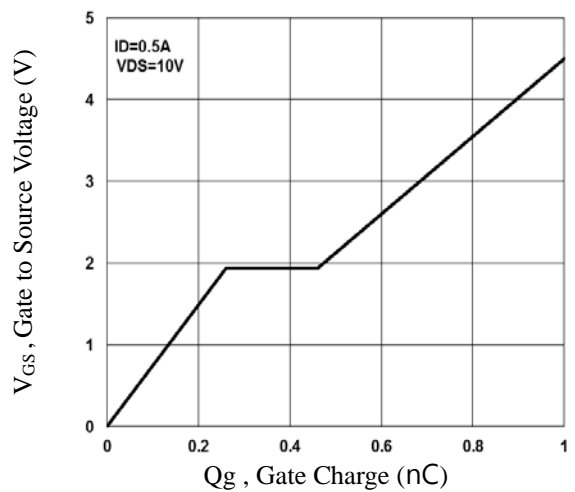


Fig.4 Gate Charge Waveform

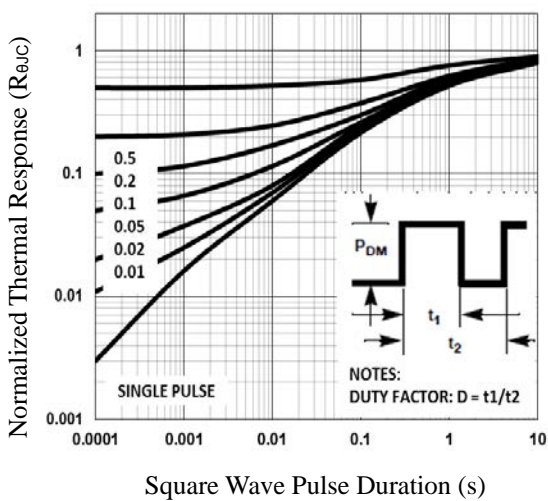


Fig.5 Normalized Transient Impedance

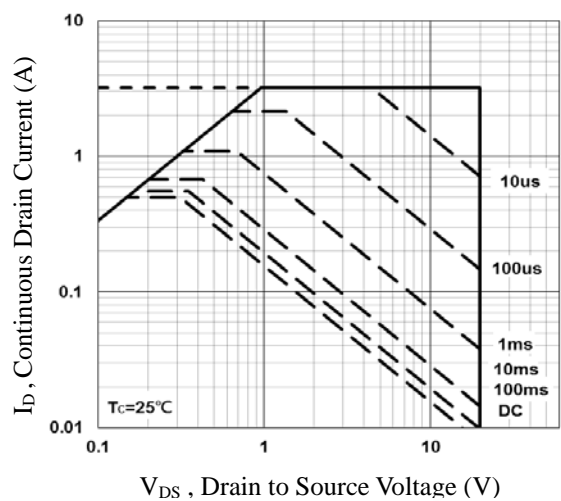


Fig.6 Maximum Safe Operation Area

DEVICE CHARACTERISTICS

YSE2320WKL

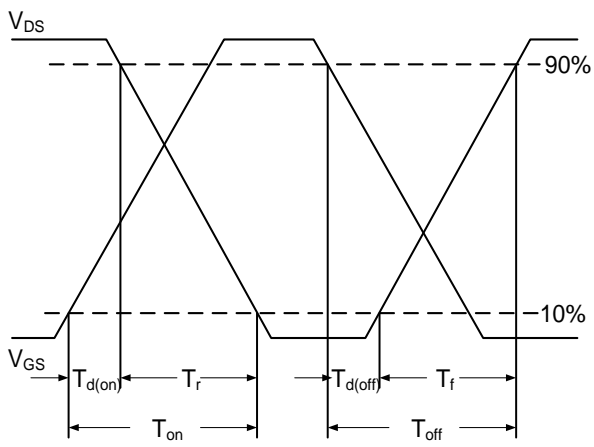


Fig.7 Switching Time Waveform

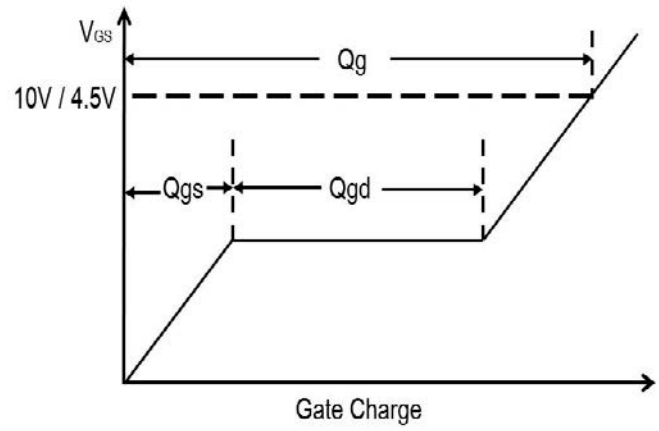
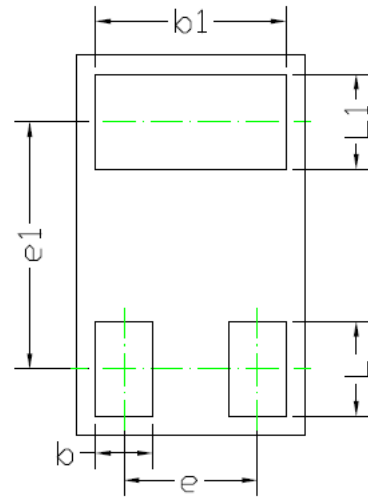
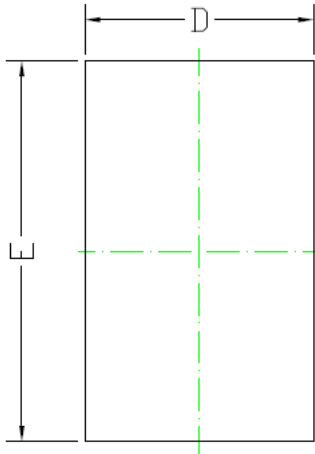


Fig.8 Gate Charge Waveform

PACKAGE OUTLINE & DIMENSIONS

YSE2320WKL

SOT-883 PACKAGE INFORMATION



SIDE VIEW



SYMBOL	COMMON		
	DIMENSIONS MILLIMETER		
	MIN	NOM.	MAX
A	0.40	0.45	0.50
A3	0.127 BSC		
D	0.55	0.60	0.65
E	0.95	1.00	1.05
e	0.35 BSC		
e1	0.65 BSC		
b	0.13	0.15	0.18
b1	0.45	0.50	0.55
L	0.20	0.25	0.30
L1	0.20	0.25	0.30