



YEA SHIN TECHNOLOGY CO., LTD

YSE2319WKL

# P-Channel Enhancement MOSFET

VDS= -20V, ID= -0.25A



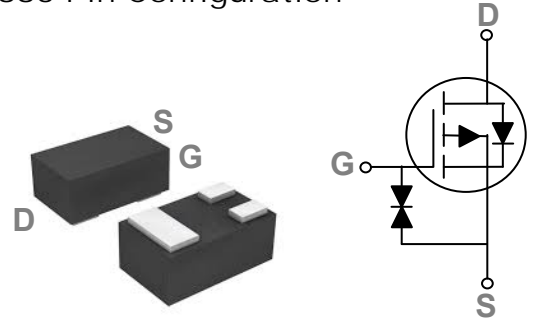
## Features

- -20V,-250mA,  $R_{DS(ON)} = 650m\Omega @ V_{GS} = -4.5V$
- Improved  $dv/dt$  capability
- Fast switching
- Green Device Available
- Suit for -1.5V Gate Drive Applications

## Applications

- Notebook
- Load Switch
- 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 <sub>DS</sub>	Drain-Source Voltage	-20	V
V <sub>GS</sub>	Gate-Source Voltage	±8	V
I <sub>D</sub>	Drain Current – Continuous ( $T_c=25^\circ C$ )	-250	mA
	Drain Current – Continuous ( $T_c=100^\circ C$ )	-160	mA
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	-1	A
P <sub>D</sub>	Power Dissipation ( $T_c=25^\circ C$ )	1.55	mW
	Power Dissipation – Derate above 25°C	1.25	mW/°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	800	°C / W

# DEVICE CHARACTERISTICS

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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 $25^\circ\text{C}$ , $I_D=-1\text{mA}$	---	-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	$\mu A$
		$V_{DS}=-16V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 8V, V_{DS}=0V$	---	---	$\pm 20$	$\mu A$

### On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance	$V_{GS}=-4.5V, I_D=-4A$	---	500	650	$m\Omega$
		$V_{GS}=-2.5V, I_D=-3A$	---	700	900	$m\Omega$
		$V_{GS}=-1.8V, I_D=-3A$	---	1100	1400	$m\Omega$
		$V_{GS}=-1.5V, I_D=-3A$	---	1700	2300	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.3	-0.7	-1	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	3	---	$mV/^\circ\text{C}$

### Dynamic and Switching Characteristics

$Q_g$	Total Gate Charge <sup>2,3</sup>	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-0.2A$	---	1	2	nC
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>		---	0.28	0.5	
$Q_{gd}$	Gate-Drain Charge <sup>2,3</sup>		---	0.18	0.4	
$T_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=10\Omega, I_D=-0.2A$	---	8	16	ns
$T_r$	Rise Time <sup>2,3</sup>		---	5.2	10	
$T_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	30	60	
$T_f$	Fall Time <sup>2,3</sup>		---	18	36	
$C_{iss}$	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$	---	40	78	pF
$C_{oss}$	Output Capacitance		---	15	30	
$C_{rss}$	Reverse Transfer Capacitance		---	6.5	13	

### 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	---	---	-0.25	A
$I_{SM}$	Pulsed Source Current		---	---	-0.5	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=-0.2A, T_J=25^\circ\text{C}$	---	---	-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

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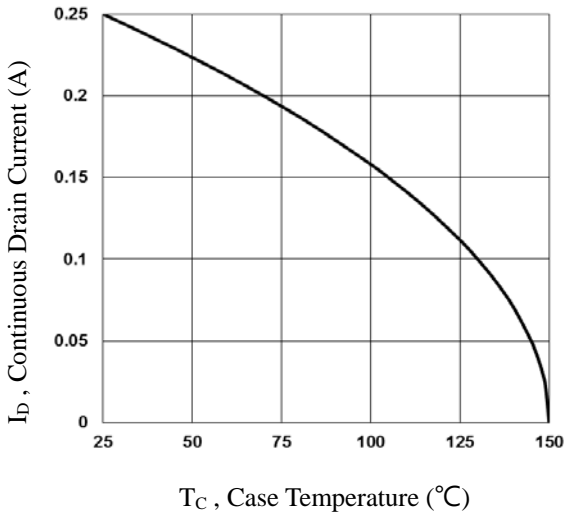


Fig.1 Continuous Drain Current vs.  $T_c$

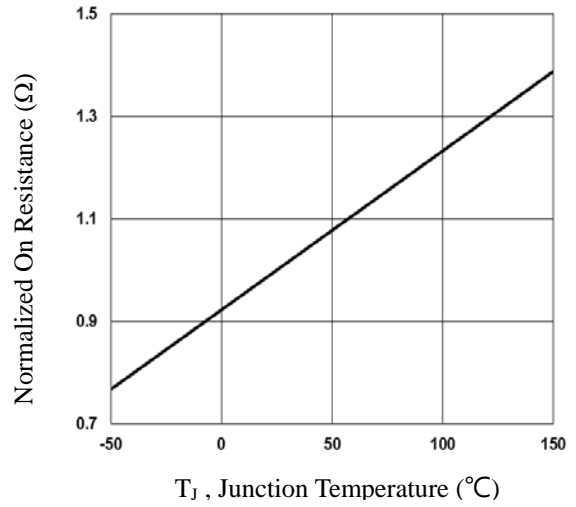


Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$

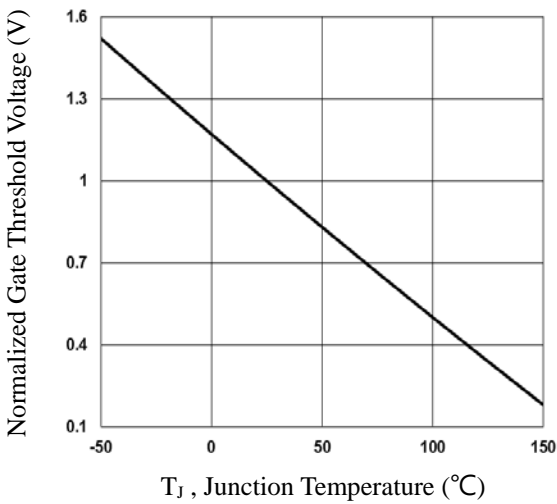


Fig.3 Normalized  $V_{th}$  vs.  $T_j$

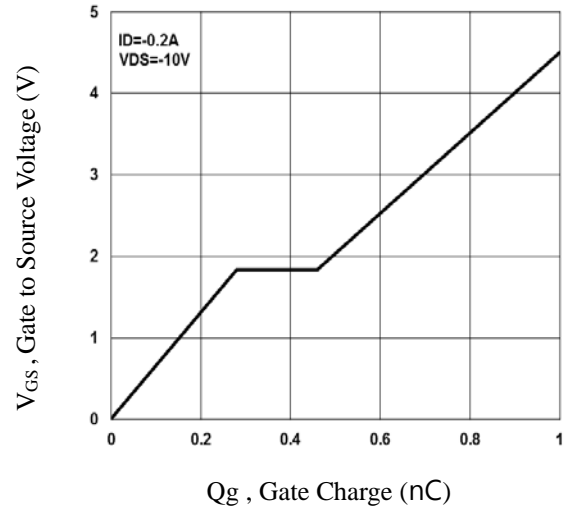


Fig.4 Gate Charge Waveform

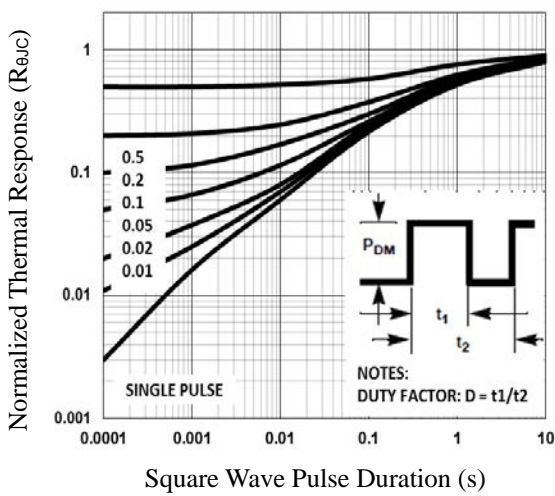


Fig.5 Normalized Transient Impedance

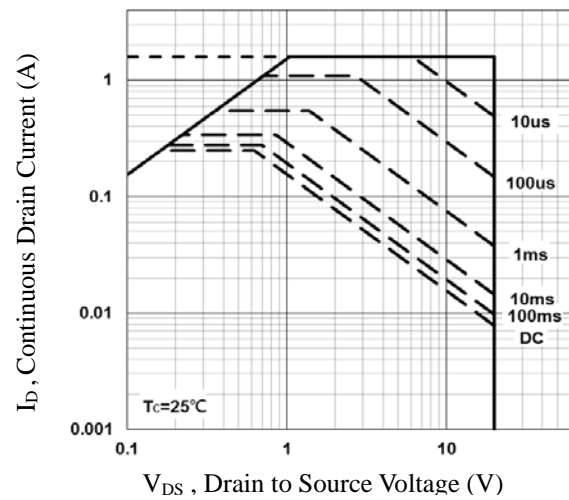


Fig.6 Maximum Safe Operation Area

# DEVICE CHARACTERISTICS

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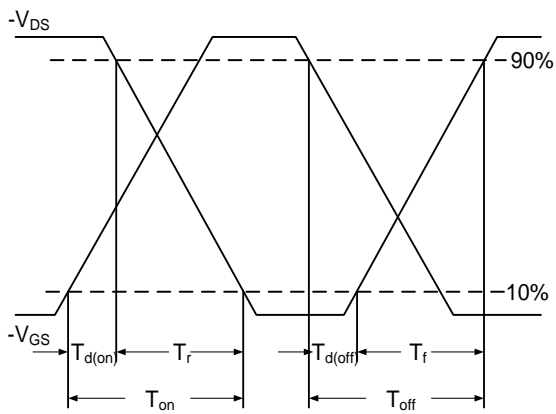


Fig.7 Switching Time Waveform

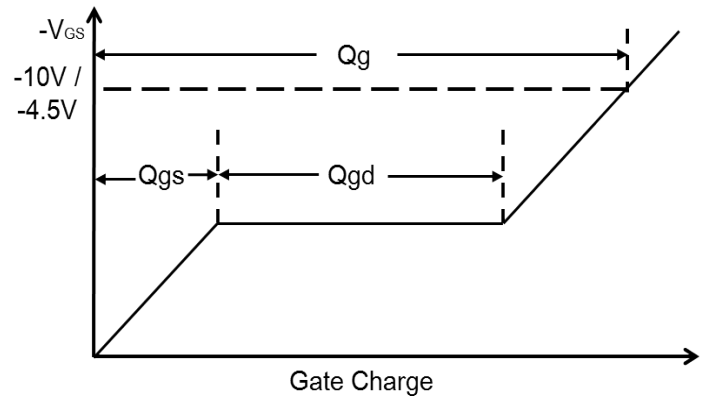
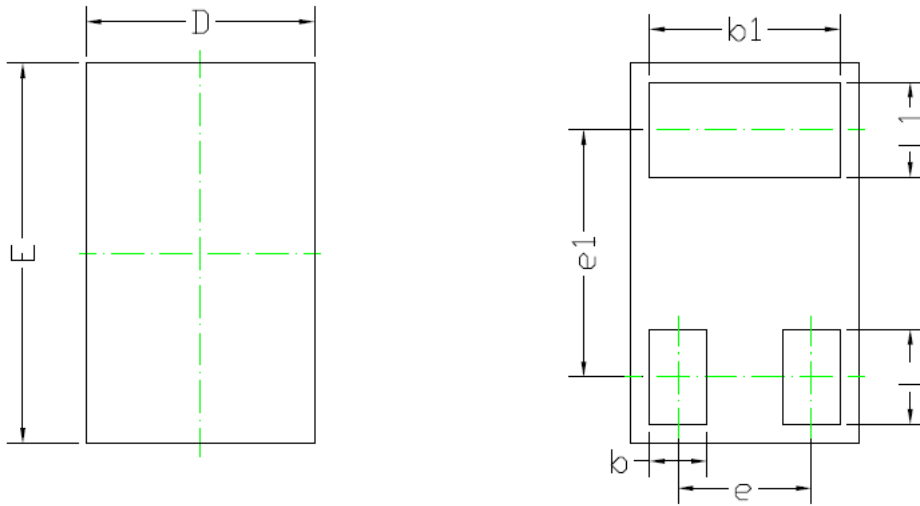


Fig.8 Gate Charge Waveform

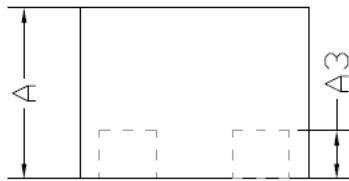
# PACKAGE OUTLINE & DIMENSIONS

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## 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