



P-Channel Enhancement MOSFET



VDS= -30V, ID= -8.5A

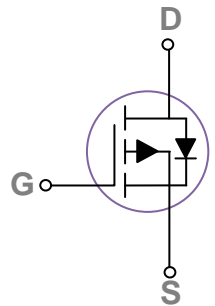
Features

- -30V,-8.5A, $R_{DS(ON)} = 23m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available
- Suit for -4.5V Gate Drive Applications

Applications

- MB / VGA / Vcore
- POL Applications
- Load Switch
- LED Application

PPAK2x3 Pin Configuration



Absolute Maximum Rating $T_c=25^\circ C$ 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 ($T_c=25^\circ C$)	-8.5	A
	Drain Current – Continuous ($T_c=100^\circ C$)	-5.3	A
I _{DM}	Drain Current – Pulsed ¹	-34	A
P _D	Power Dissipation ($T_c=25^\circ C$)	3	W
	Power Dissipation – Derate above 25°C	0.025	W/°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	---	90	°C /W
R _{θJC}	Thermal Resistance Junction to Case	---	40	°C /W

DEVICE CHARACTERISTICS

YSE3907WBC

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	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=-1mA$	---	-0.03	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-30V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-24V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 20	μA

On Characteristics

$R_{DS(ON)}$	Static Drain-source On-Resistance ²	$V_{GS}=-10V, I_D=-5A$	---	19	23	$m\Omega$
		$V_{GS}=-4.5V, I_D=-3A$	---	28	34	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	$mV/^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-3A$	---	6.8	---	S

Dynamic and Switching Characteristics

Q_g	Total Gate Charge ^{2,3}	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-5A$	---	11	17	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	3.4	6	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	4.2	8	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega, I_D=-1A$	---	5.8	11	ns
T_r	Rise Time ^{2,3}		---	18.8	36	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	46.9	90	
T_f	Fall Time ^{2,3}		---	12.3	23	
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$	---	1250	2500	pF
C_{oss}	Output Capacitance		---	160	320	
C_{rss}	Reverse Transfer Capacitance		---	90	180	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	-8.5	A
I_{SM}	Pulsed Source Current ²		---	---	-17	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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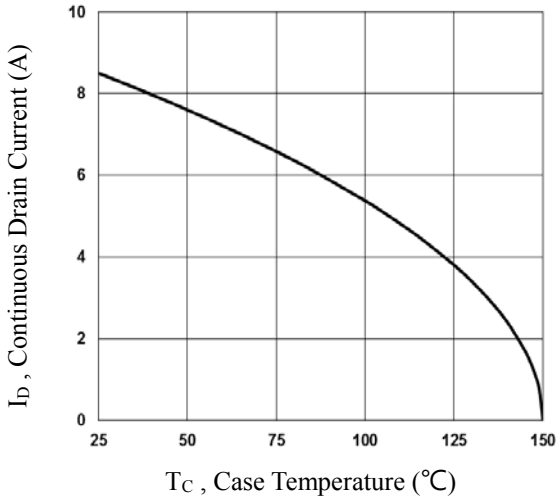


Fig.1 Continuous Drain Current vs. T_c

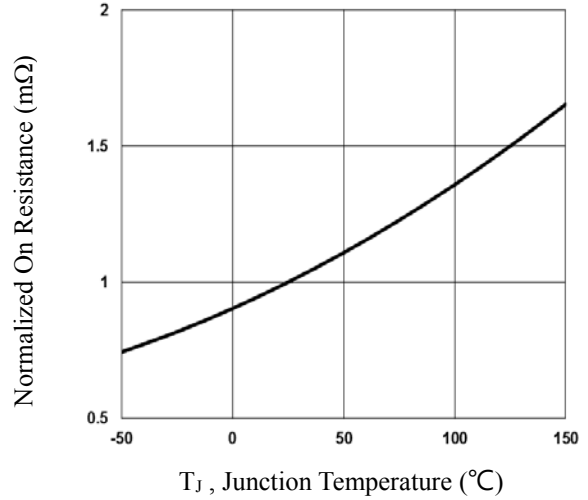


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

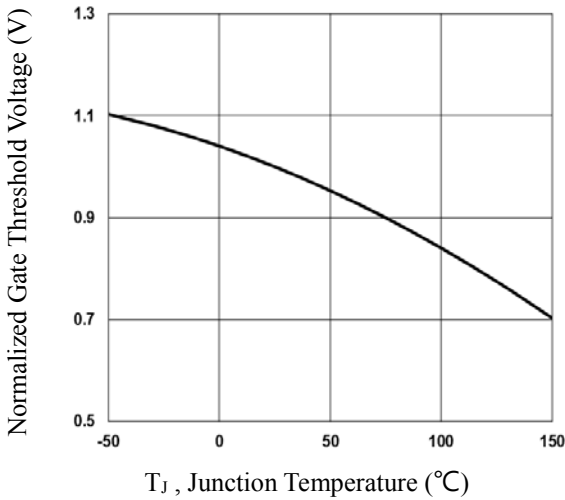


Fig.3 Normalized V_{th} vs. T_j

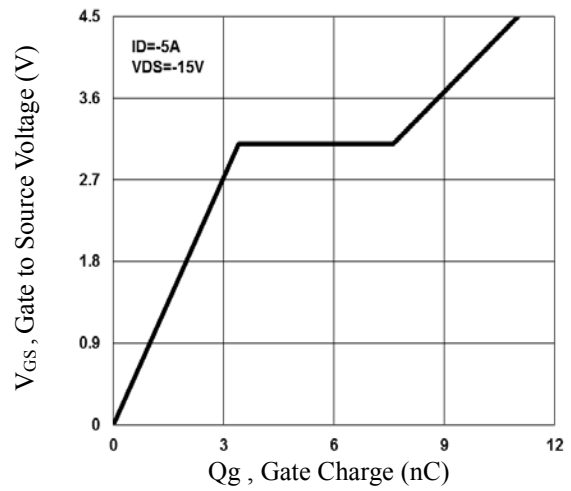


Fig.4 Gate Charge Waveform

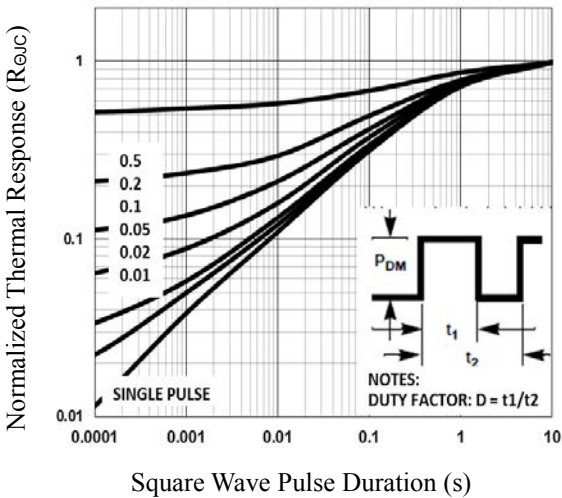


Fig.5 Normalized Transient Response

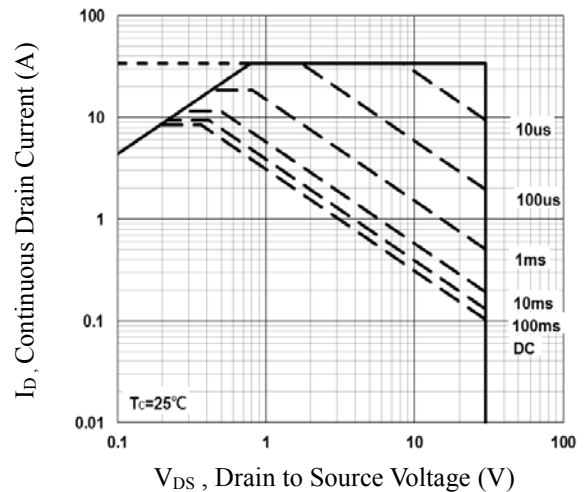


Fig.6 Maximum Safe Operation Area

DEVICE CHARACTERISTICS

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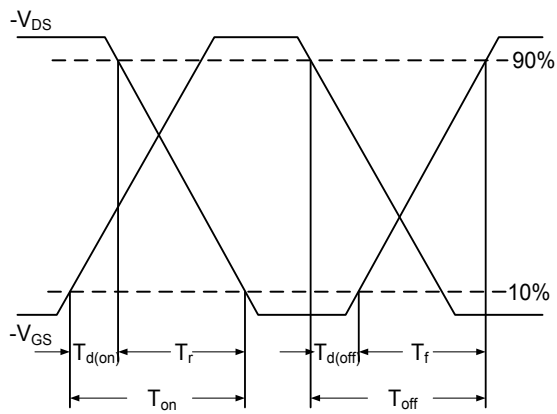


Fig.7 Switching Time Waveform

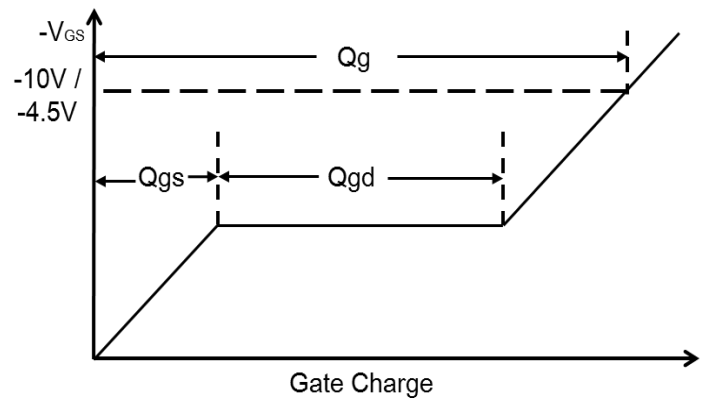
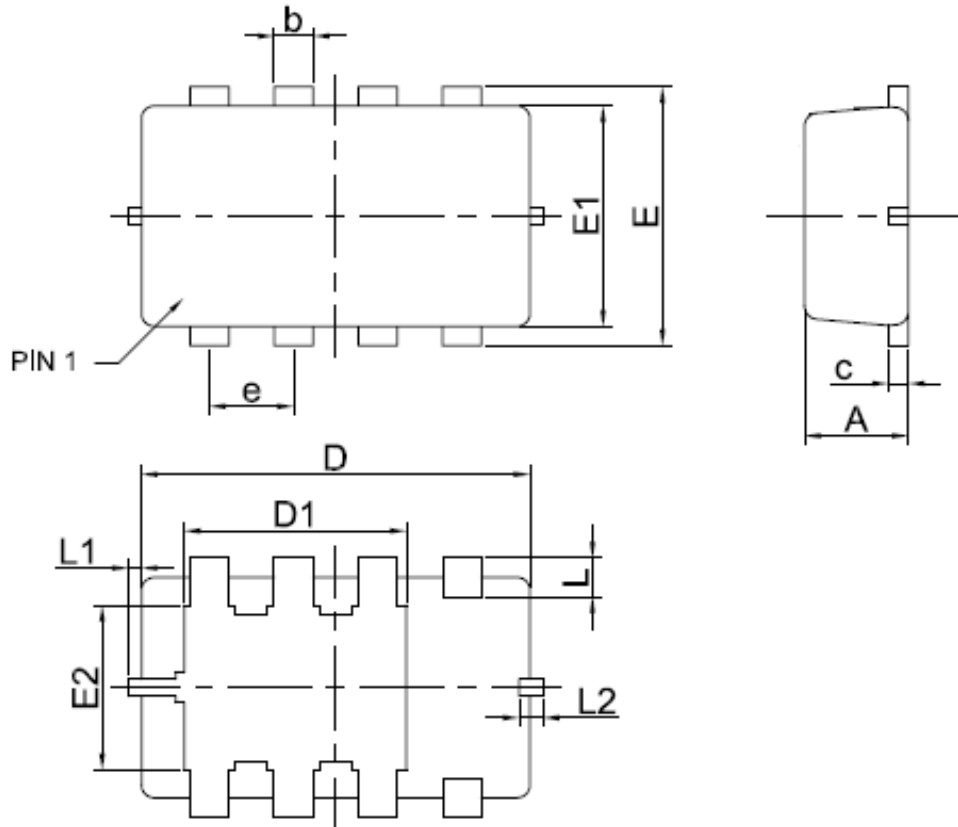


Fig.8 EAS Waveform

PACKAGE OUTLINE & DIMENSIONS

YSE3907WBC

PPAK2x3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.900	0.700	0.035	0.028
b	0.350	0.240	0.014	0.009
c	0.200	0.080	0.008	0.003
D	3.100	2.900	0.122	0.114
D1	1.720	1.520	0.068	0.060
E	2.100	1.900	0.083	0.075
E1	1.800	1.600	0.071	0.063
E2	1.270	1.070	0.050	0.042
e	0.65BSC		0.026BSC	
L	0.400	0.200	0.016	0.008
L1	0.100	0.000	0.004	0.000
L2	0.184	-	0.007	-