YEA SHIN TECHNOLOGY CO., LTD

P-Channel Enhancement MOSFET

VDS= -20V, ID= -26A

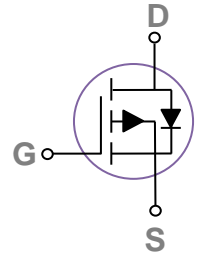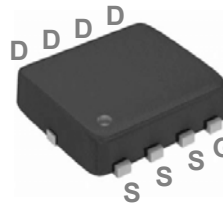### YS2305ZBB

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Features

- *-20V,-26A, RDS(ON) =15mΩ@VGS = -4.5V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*
- *Suit for -1.8V Gate Drive Applications*

Applications

- *Notebook*
- *Load Switch*
- *Networking*
- *Hand-Held Instruments*

PPAK3x3 Pin Configuration

Absolute Maximum Ratings Tc=25℃ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±10	V
I_D	Drain Current – Continuous (Tc=25℃)	-26	A
	Drain Current – Continuous (Tc=100℃)	-14	A
I_{DM}	Drain Current – Pulsed[1]	-104	A
P_D	Power Dissipation (Tc=25℃)	44	W
	Power Dissipation – Derate above 25℃	0.36	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
$R_{θJA}$	Thermal Resistance Junction to ambient	---	50	℃/W
$R_{θJC}$	Thermal Resistance Junction to Case	---	2.8	℃/W

DEVICE CHARACTERISTICS

YS2305ZBB

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	-20	---	---	V
△BV$_{DSS}$/△T$_J$	BV$_{DSS}$ Temperature Coefficient	Reference to 25℃ , I$_D$=-1mA	---	-0.01	---	V/℃
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=-20V, V$_{GS}$=0V, T$_J$=25℃	---	---	-1	uA
		V$_{DS}$=-16V, V$_{GS}$=0V, T$_J$=125℃	---	---	-10	uA
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=±10V, V$_{DS}$=0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R$_{DS(ON)}$	Static Drain-source On-Resistance	V$_{GS}$=-4.5V, I$_D$=-6A	---	12	15	mΩ
		V$_{GS}$=-2.5V, I$_D$=-4A	---	15	20	mΩ
		V$_{GS}$=-1.8V, I$_D$=-3A	---	20	26	mΩ
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$=-250uA	-0.3	-0.6	-1	V
△V$_{GS(th)}$	V$_{GS(th)}$ Temperature Coefficient		---	3	---	mV/℃
gfs	Forward Transconductance	V$_{DS}$=-10V, I$_D$=-6A	---	20	---	S

Dynamic and Switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q$_g$	Total Gate Charge[2,3]	V$_{DS}$=-10V, V$_{GS}$=-4.5V, I$_D$=-6A	---	27	40	nC
Q$_{gs}$	Gate-Source Charge[2,3]		---	2.4	4.8	
Q$_{gd}$	Gate-Drain Charge[2,3]		---	5.3	8	
T$_{d(on)}$	Turn-On Delay Time[2,3]	V$_{DD}$=-10V, V$_{GS}$=-4.5V, R$_G$=25Ω, I$_D$=-1A	---	16.2	31	ns
T$_r$	Rise Time[2,3]		---	43.5	83	
T$_{d(off)}$	Turn-On Delay Time[2,3]		---	114	217	
T$_f$	Fall Time[2,3]		---	28.8	55	
C$_{iss}$	Input Capacitance	V$_{DS}$=-15V, V$_{GS}$=0V, f=1MHz	---	2320	3370	pF
C$_{oss}$	Output Capacitance		---	280	410	
C$_{rss}$	Reverse Transfer Capacitance		---	175	260	

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	---	---	-11	A
I$_{SM}$	Pulsed Source Current		---	---	-44	A
V$_{SD}$	Diode Forward Voltage	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.
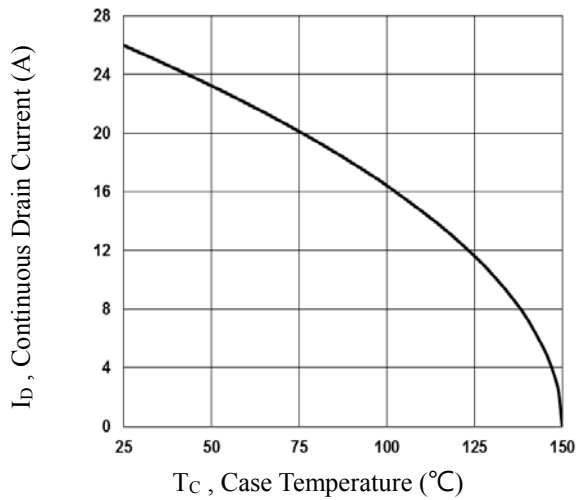
DEVICE CHARACTERISTICS

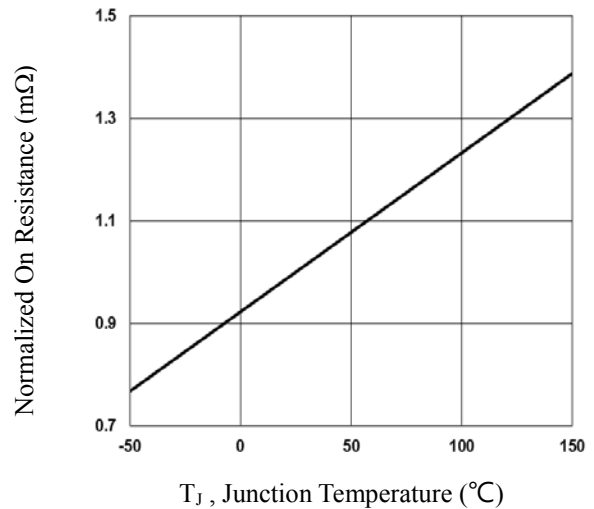## YS2305ZBB

Fig.1   Continuous Drain Current vs. T_C

Fig.2   Normalized RDSON vs. T_J
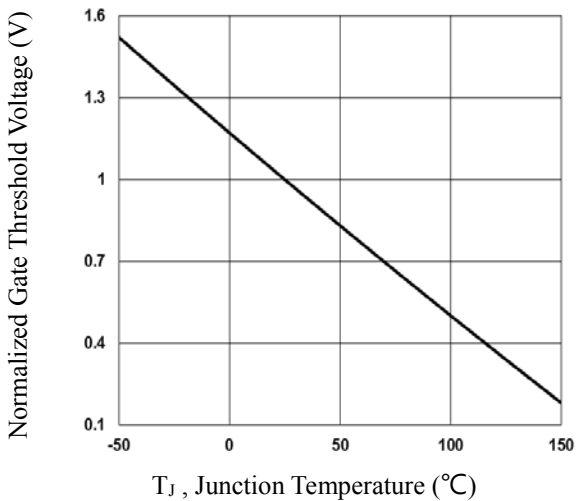
Fig.3   Normalized V_{th} vs. T_J
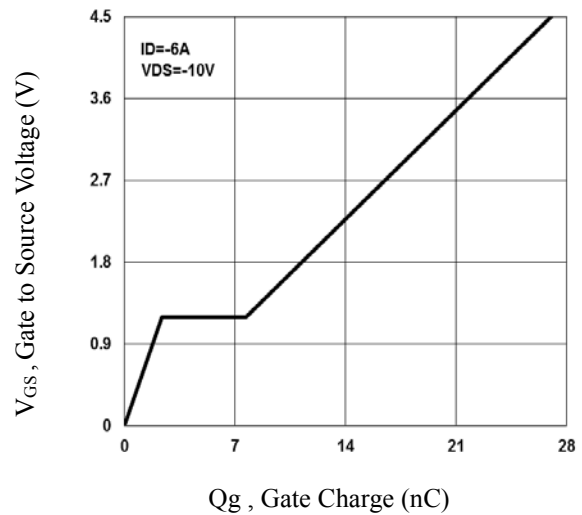
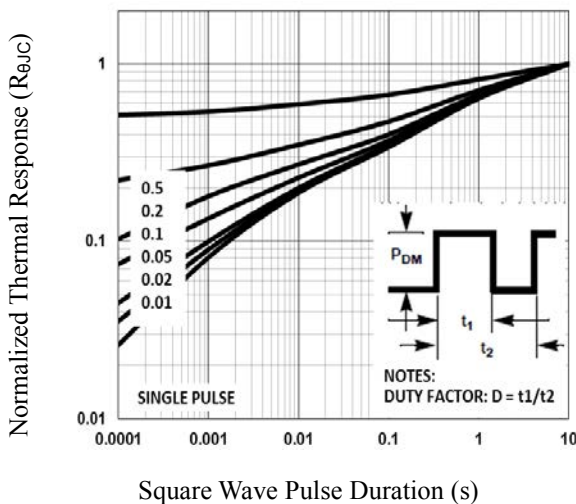Fig.4   Gate Charge Waveform

Fig.5   Normalized Transient Impedance
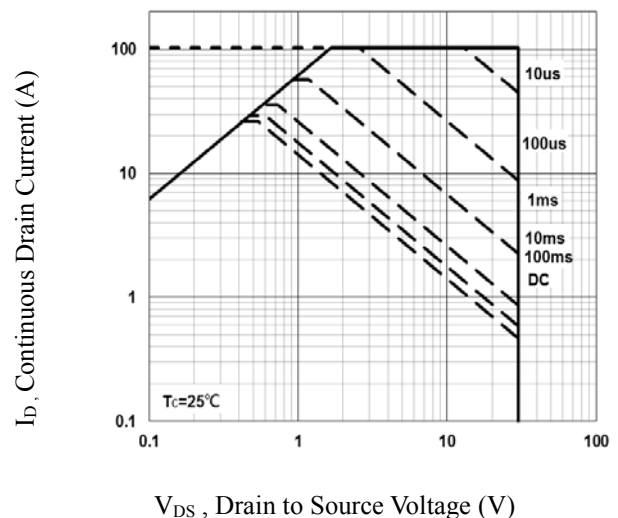
Fig.6   Maximum Safe Operation Area

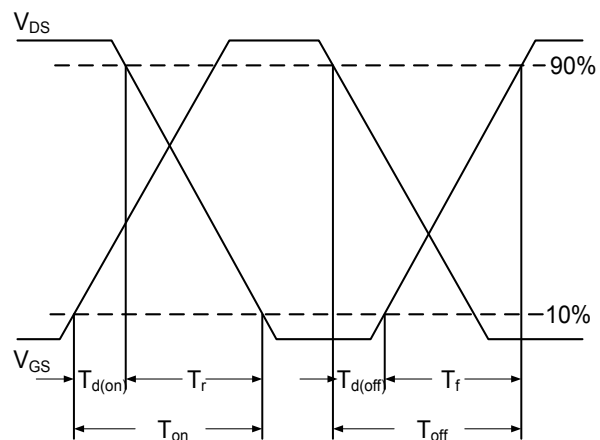# DEVICE CHARACTERISTICS

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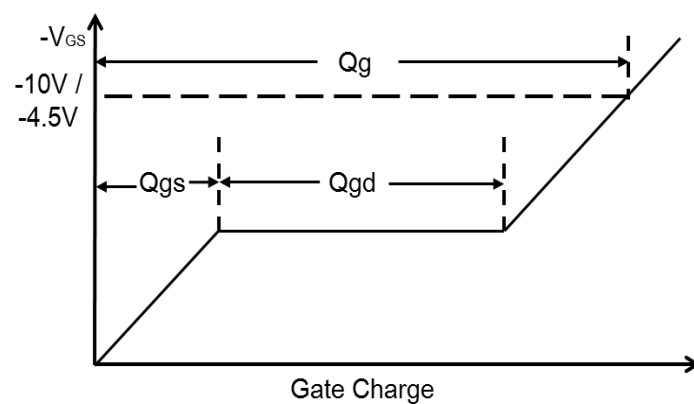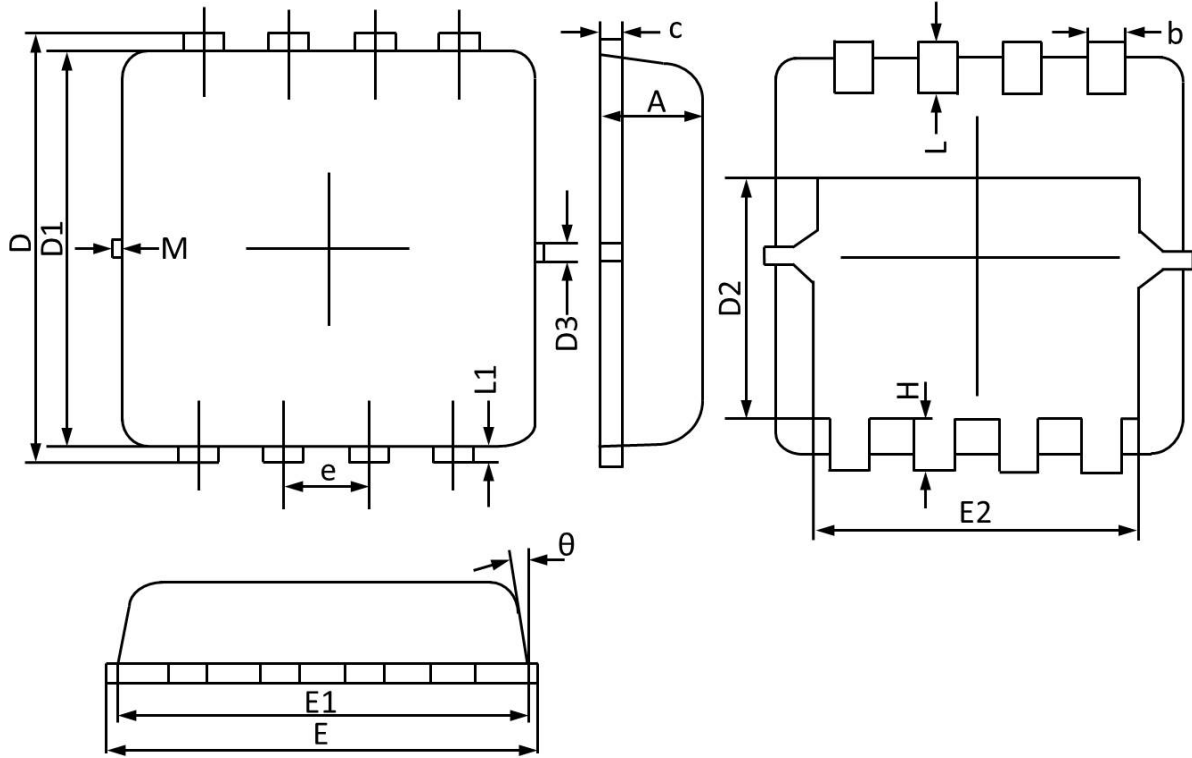

Fig.7   Switching Time Waveform

Fig.8   Gate Charge Waveform

PACKAGE OUTLINE & DIMENSIONS

YS2305ZBB

PPAK3x3 PACKAGE INFORMATION

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	