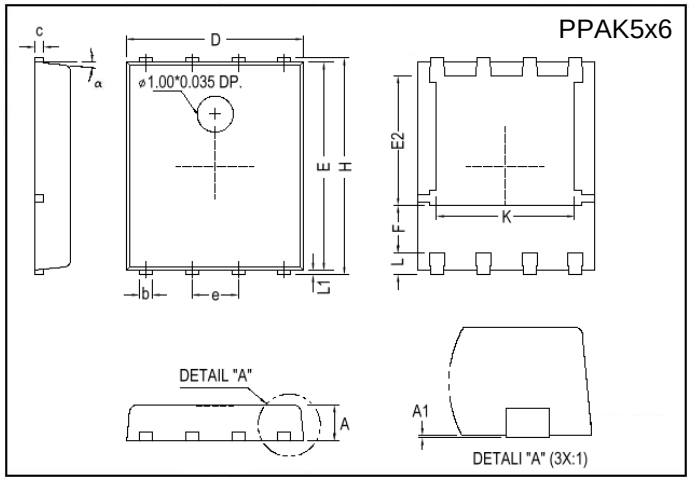
YEA SHIN TECHNOLOGY CO., LTD

YS30N06BA

N-Channel Enhancement MOSFET

VDS= 30V, ID= 40A



DESCRIPTION

The YS30N06BA uses advanced Trench technology and designs to provide excellent $R_{DS(ON)}$ with low gate charge.

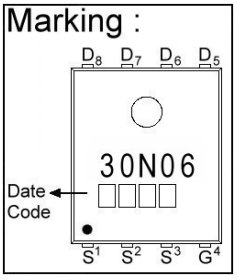
This device is suitable for use in PWM, load switching and general purpose applications.

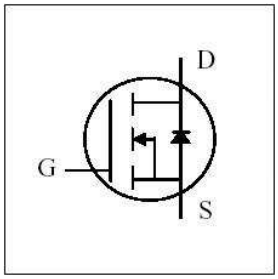
The YS30N06BA meet the RoHS and Green Product requirement, 100% EAS and Rg guaranteed with full function reliability approved.

FEATURES

- Low On-Resistance
- Low Input Capacitance
- Green Device Available
- Low Miller Charge
- 100% EAS and Rg Guaranteed

REF.	Millimeter			REF.	Millimeter		
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	0.85	1.00	1.15	E	5.70	-	5.90
A1	0.00	-	0.10	e	-	1.27	-
b	0.30	-	0.51	H	5.90	-	6.20
c	0.20	-	0.30	L	-	0.60	-
D	4.80	-	5.00	L1	0.06	-	0.20
F	1.10REF.			α	0°	-	12°
E2	3.50REF.			K	3.70	3.90	4.10





Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D @T_C=25℃	40	A
	I_D @T_C=70℃	40	A
Pulsed Drain Current[1]	I_{DM}	100	A
Continuous Drain Current	I_D @T_A=25℃	31	A
	I_D @T_A=70℃	25	A
Total Power Dissipation	P_D @T_C=25℃	36	W
	P_D @T_A=25℃	4.2	W
Single Pulse Avalanche Energy, L=0.1mH	E_{AS}	72	mJ
Single Pulse Avalanche Current, L=0.1mH	I_{AS}	38	A
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	℃

Thermal Data

Parameter	Symbol	Conditions	Max. Value	Unit
Thermal Resistance Junction-ambient[2]	$R_{\theta JA}$	Steady State	30	℃/W
Thermal Resistance Junction-case[2]	$R_{\theta JC}$	Steady State	3.5	℃/W

DEVICE CHARACTERISTICS

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Electrical Characteristics (T_J = 25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250uA
Gate Threshold Voltage	$V_{GS(th)}$	1.15	-	2.2	V	V_{DS}=V_{GS}, I_D=250uA
Forward Transconductance[1]	g_{fs}	-	82	-	S	V_{DS}=15V, I_D=19A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	I_{DSS}	-	-	1	uA	V_{DS}=30V, V_{GS}=0
Static Drain-Source On-Resistance[1]	$R_{DS(ON)}$	-	3.3	4.5	mΩ	V_{GS}=10V, I_D=19A
		-	4.6	5.6		V_{GS}=4.5V, I_D=16A
Total Gate Charge[1]	Q_g	-	12	-	nC	I_D=19A V_{DS}=15V V_{GS}=4.5V
Gate-Source Charge	Q_{gs}	-	6	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	5	-		
Turn-on Delay Time[1]	$T_{d(on)}$	-	24	-	ns	V_{DS}=15V I_D=10A V_{GS}=4.5V R_G=1.0Ω R_L=1.5Ω
Rise Time	T_r	-	21	-		
Turn-off Delay Time	$T_{d(off)}$	-	25	-		
Fall Time	T_f	-	17	-		
Input Capacitance	C_{iss}	-	1750	-	pF	V_{GS}=0V V_{DS}=15V f=1.0MHz
Output Capacitance	C_{oss}	-	360	-		
Reverse Transfer Capacitance	C_{rss}	-	150	-		
Gate Resistance	R_g	-	3.2	5.0	Ω	f=1.0MHz

Guaranteed Avalanche Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Single Pulse Avalanche Energy[3]	EAS	48	-	-	mJ	V_{DD}=20V, L=0.1mH, I_{AS}=31A

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage[1]	V_{SD}	-	0.8	1.2	V	I_S=10A, V_{GS}=0V
Continuous Source Current[1]	I_S	-	-	40	A	---
Reverse Recovery Time	t_{rr}	-	25	-	ns	I_F=10A, dI/dt=100A/μs, T_J=25℃
Reverse Recovery Charge	Q_{rr}	-	17	-	nC	

Notes: **1. The data tested by pulsed, pulse width ≦ 300us, duty cycle ≦ 2%.**

2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 in still air.

3. The Min. value is 100% EAS tested guarantee.

DEVICE CHARACTERISTICS

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Typical Characteristics

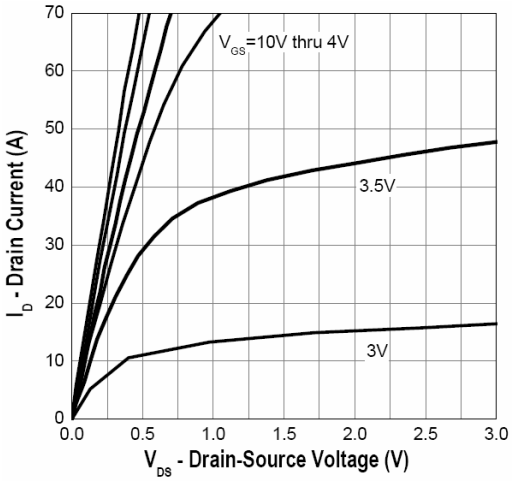

Fig.1 Typical Output Characteristics

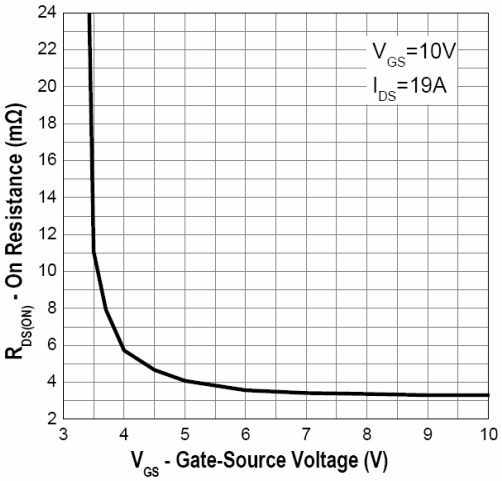

Fig.2 On-Resistance vs. G-S Voltage

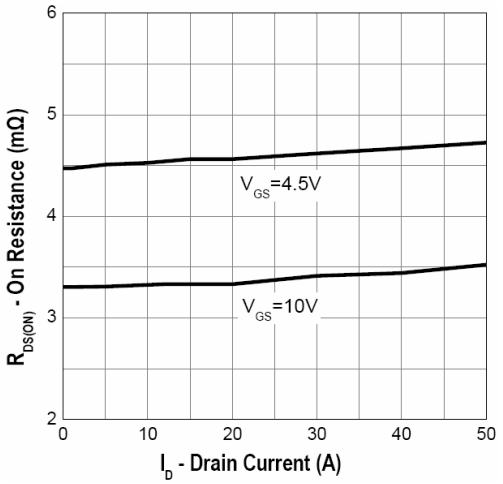

Fig.3 On-Resistance vs. Drain Current

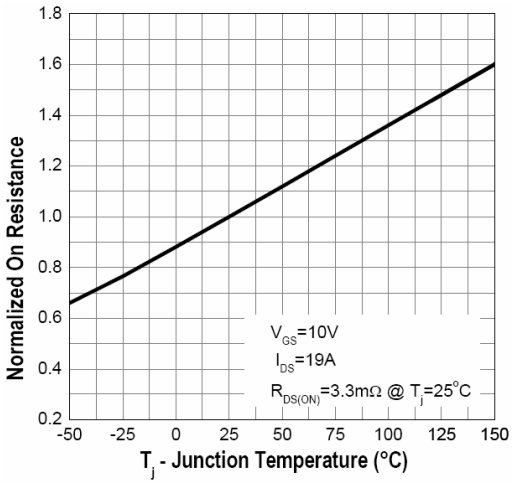

Fig.4 Normalized R_{DSON} vs. T_J

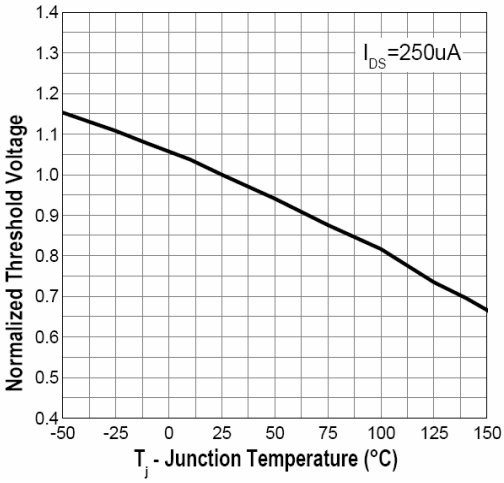

Fig.5 Normalized $V_{GS(th)}$ vs. T_J

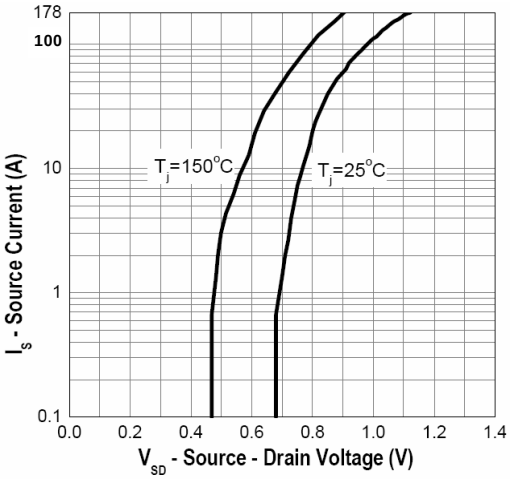

Fig.6 Forward Characteristics of Reverse

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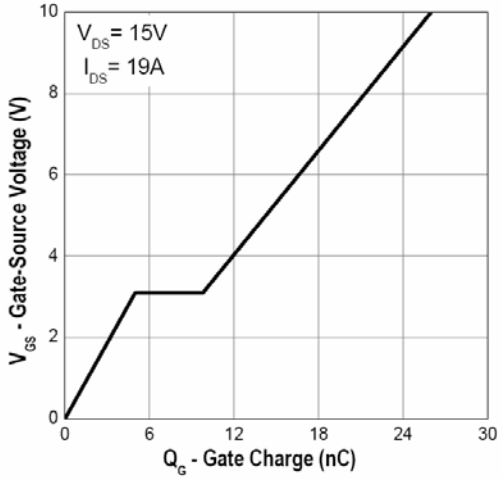

Fig.7 Gate Charge Characteristics

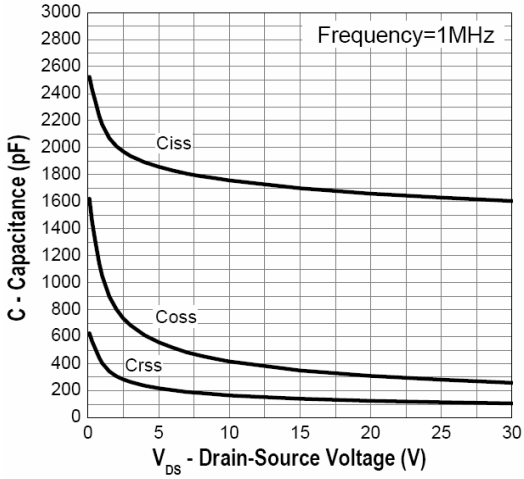

Fig.8 Capacitance Characteristics

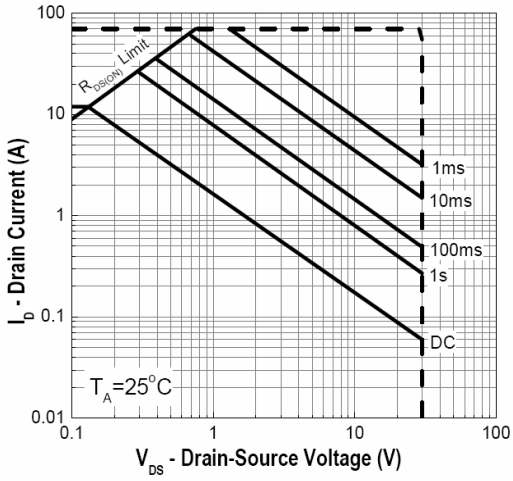

Fig.9 Safe Operating Area

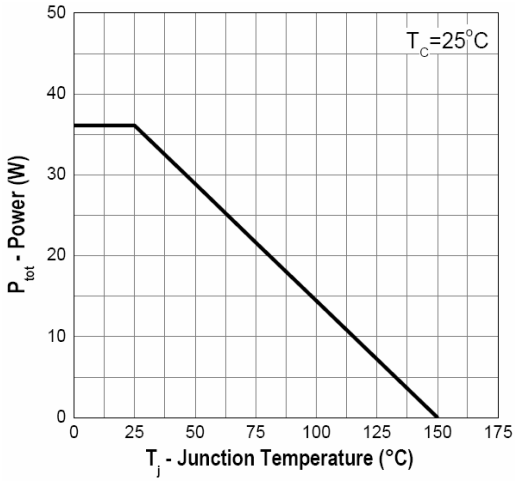

Fig.10 Power Dissipation

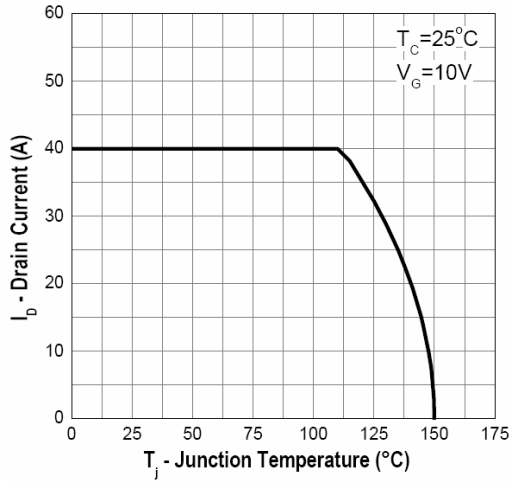

Fig.11 Drain Current vs. T_J

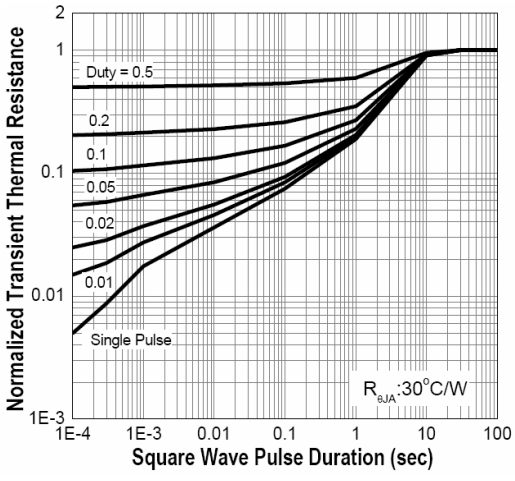

Fig.12 Transient Thermal Impedance