YEA SHIN TECHNOLOGY CO., LTD

YS50N03BA

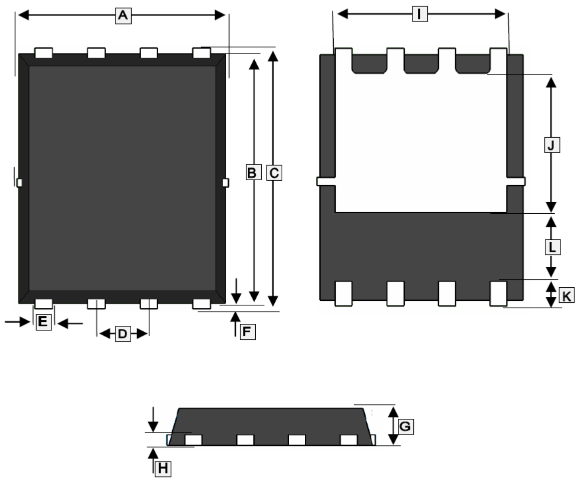
N-Channel Enhancement MOSFET

VDS = 30V, ID = 51A

DESCRIPTION

The YS50N03BA provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. The PPAK5x6 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

PPAK5x6

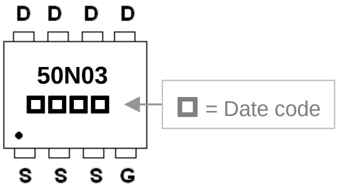


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.8	5.1	G	0.8	1.1
B	5.7	5.9	H	0.254 Ref.	
C	5.9	6.2	I	4.0 Ref.	
D	1.27 BSC.		J	3.4 Ref.	
E	0.33	0.51	K	0.6 Ref.	
F	0.1	0.2	L	1.4 Ref.	

FEATURES

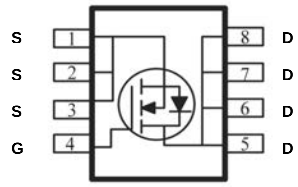
- Lower Gate Charge
- Simple Drive Requirement
- Fast Switching Characteristic

MARKING



PACKAGE INFORMATION

Package	MPQ	Leader Size
PPAK5x6	3K	13 inch



ABSOLUTE MAXIMUM RATINGS (T_A=25℃ unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1]@V_{GS}=10V	T_C=25℃	I_D	51	A
	T_C=100℃		36	A
	T_A=25℃		12	A
	T_A=70℃		9.6	A
Pulsed Drain Current [2]		I_{DM}	130	A
Single Pulse Avalanche Energy [3]		EAS	130	mJ
Avalanche Current		I_{AS}	34	A
Power Dissipation [4]	T_C=25℃	P_D	46	W
Operating Junction & Storage Temperature		T_J, T_{STG}	-55~150	℃
Thermal Resistance Rating				
Thermal Resistance Junction-Ambient[1](Max).		$R_{θJA}$	62	℃ / W
Thermal Resistance Junction-Case[1](Max).		$R_{θJC}$	2.7	℃ / W

ELECTRICAL CHARACTERISTICS (T_J = 25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS}=0, I_D= 250uA
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250uA
Forward Tranconductance	g_{fs}	-	42	-	S	V_{DS}=5V, I_D=30A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	I_{DSS}	-	-	1	uA	V_{DS}=24V, V_{GS}=0, T_J=25℃
		-	-	5		V_{DS}=24V, V_{GS}=0, T_J=55℃
Static Drain-Source On-Resistance [2]	$R_{DS(ON)}$	-	-	9	mΩ	V_{GS}=10V, I_D=30A
		-	-	13.5		V_{GS}=4.5V, I_D=15A
Gate Resistance	R_g	-	2.1	3.5	Ω	f =1.0MHz
Total Gate Charge	Q_g	-	10.6	-	nC	I_D=15A V_{DS}=15V V_{GS}=4.5V
Gate-Source Charge	Q_{gs}	-	4.2	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	4	-		
Turn-on Delay Time [2]	$T_{d(on)}$	-	6.4	-	nS	V_{DD}=15V I_D=15A V_{GS}=10V R_G=3.3Ω
Rise Time	T_r	-	70.6	-		
Turn-off Delay Time	$T_{d(off)}$	-	22.4	-		
Fall Time	T_f	-	8	-		
Input Capacitance	C_{iss}	-	1127	-	pF	V_{GS} =0 V_{DS}=15V f =1.0MHz
Output Capacitance	C_{oss}	-	194	-		
Reverse Transfer Capacitance	C_{rss}	-	77	-		
Guaranteed Avalanche Characteristics						
Single Pulse Avalanche Energy [5]	EAS	45	-	-	mJ	V_{DD}=25V, L=0.1mH, I_{AS}=20A
Source-Drain Diode						
Diode Forward Voltage [2]	V_{SD}	-	-	1	V	I_S=1A, V_{GS}=0V
Continuous Source Current [1,6]	I_S	-	-	51	A	V_G=V_D=0, Force Current
Pulsed Source Current [2,6]	I_{SM}	-	-	130	A	
Reverse Recovery Time	T_{rr}	-	12	-	nS	I_F=30A, dI/dt=100A/μS, T_J=25℃
Reverse Recovery Charge	Q_{rr}	-	3.7	-	nC	

Note:

1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper , ≦10sec , 125℃/W at steady state
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3. The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=34A
4. The power dissipation is limited by 150℃ juncti on temperature
5. The Min. value is 100% EAS tested guarantee.
6. The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

CHARACTERISTIC CURVES

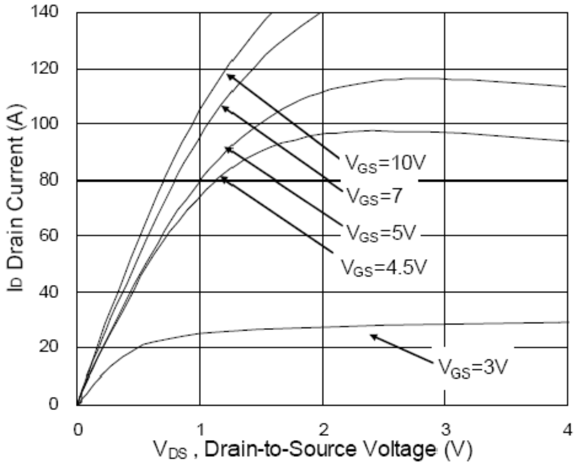


Fig.1 Typical Output Characteristics

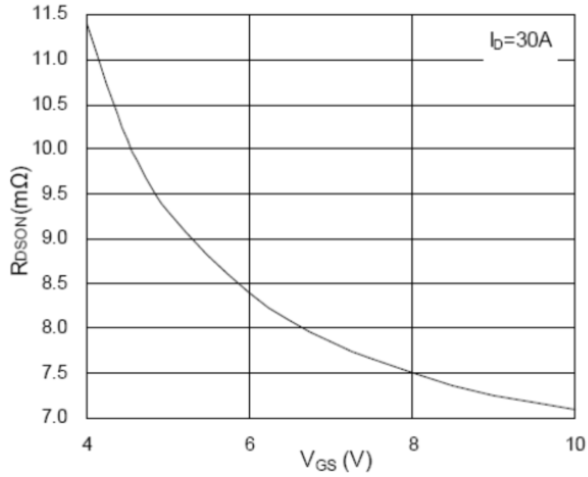


Fig.2 On-Resistance vs. Gate-Source

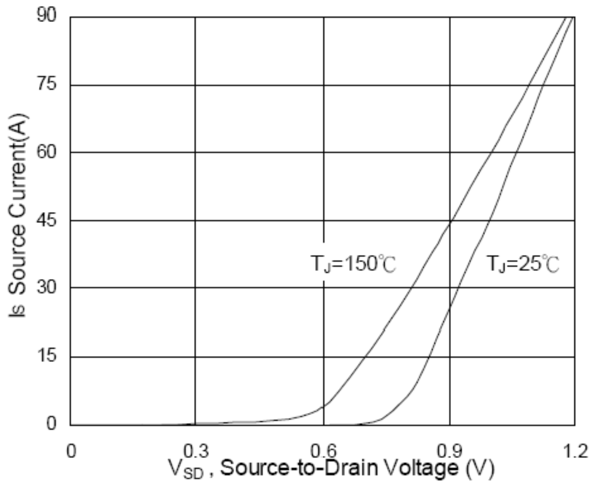


Fig.3 Forward Characteristics of Reverse

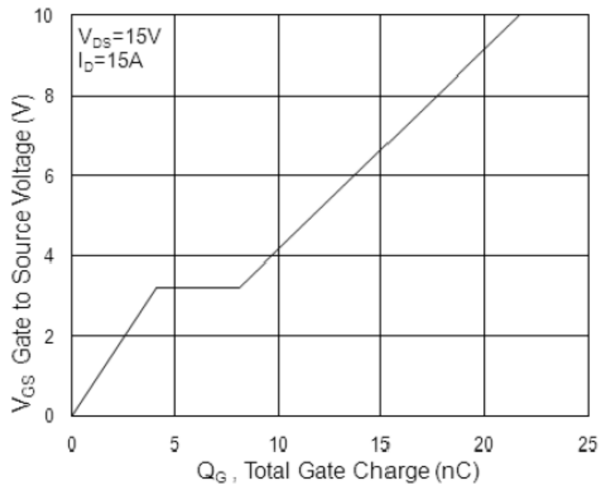


Fig.4 Gate-Charge Characteristics

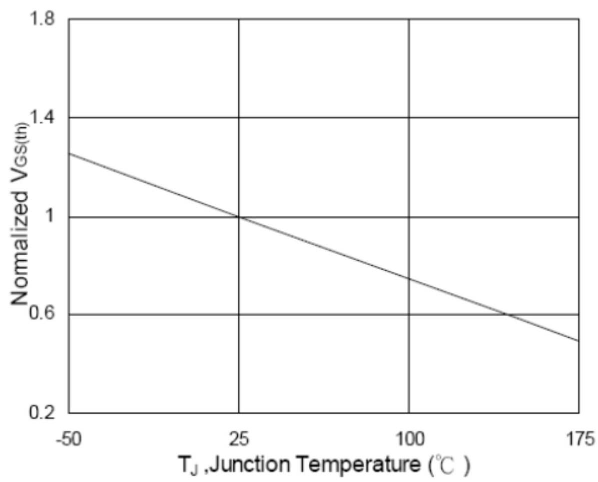


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

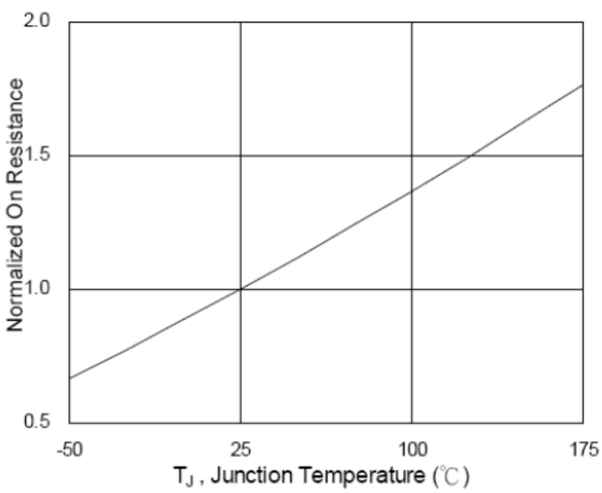


Fig.6 Normalized R_{DSON} vs. T_J

CHARACTERISTIC CURVES

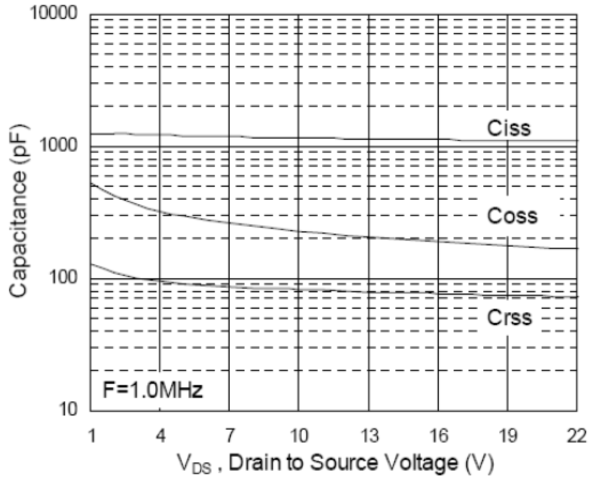


Fig.7 Capacitance

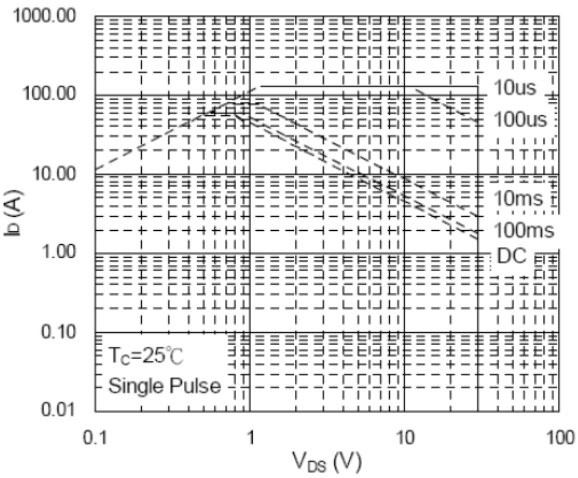


Fig.8 Safe Operating Area

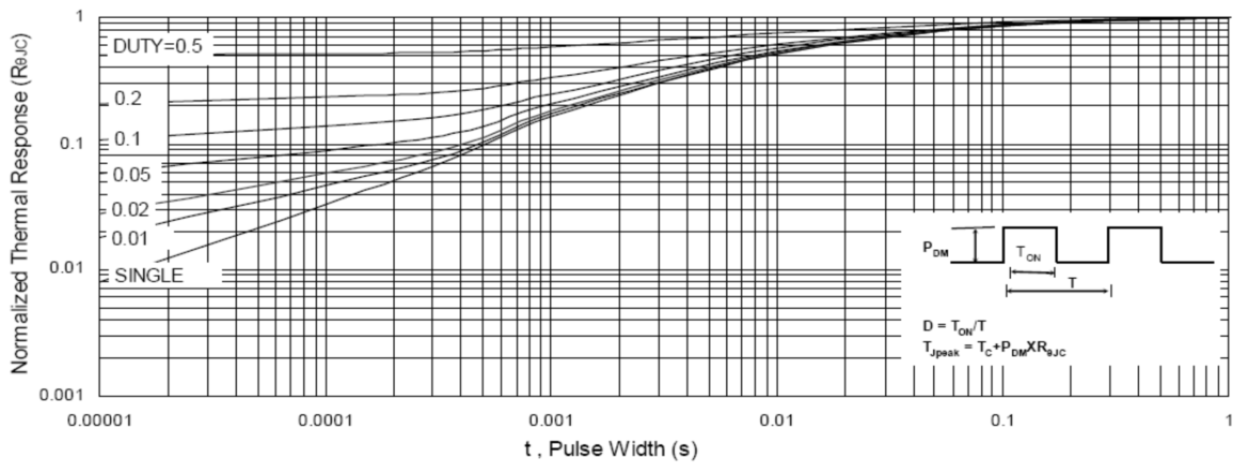


Fig.9 Normalized Maximum Transient Thermal Impedance

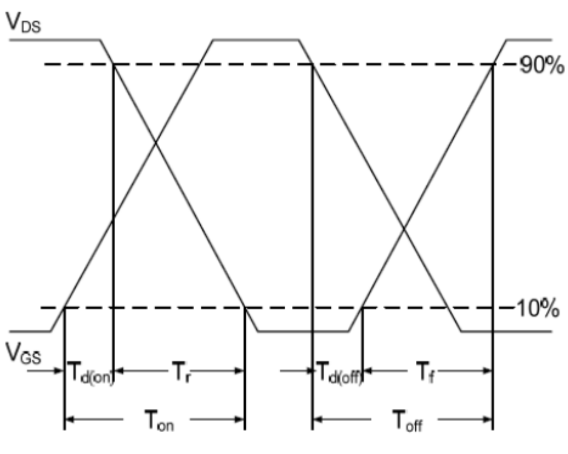


Fig.10 Switching Time Waveform

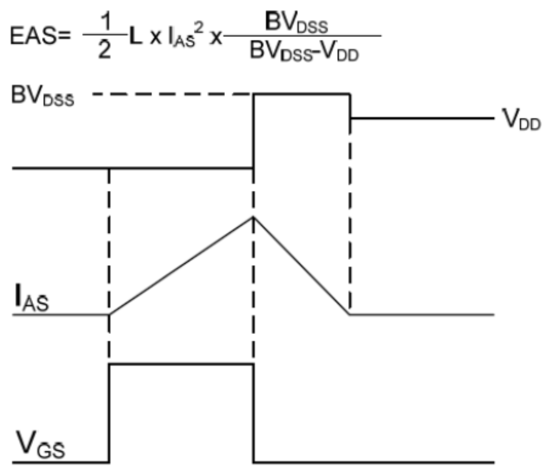


Fig.11 Unclamped Inductive Switching Waveform