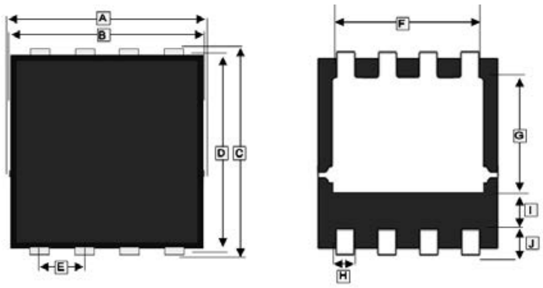
YEA SHIN TECHNOLOGY CO., LTD

YS42P03BB

P-Channel Enhancement MOSFET

VDS= -30V, ID = -42A

PPAK3x3



DESCRIPTION

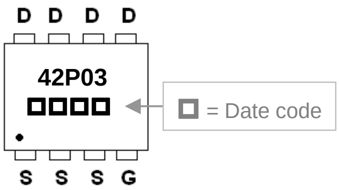
The YS42P03BB provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. The PPAK3x3 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

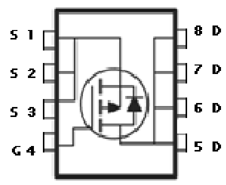
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	3.20	3.40	G	1.55	1.98
B	2.90	3.20	H	0.24	0.35
C	3.05	3.45	I	0.35 TYP.	
D	2.90	3.20	J	0.60 TYP.	
E	0.65 BSC.		K	0.10	0.25
F	2.15	2.59	L	0.70	0.90

FEATURES

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

MARKING





PACKAGE INFORMATION

Package	MPQ	Leader Size
PPAK3x3	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	-42	A
	T_C=100℃		-27	
Pulsed Drain Current [2]		I_{DM}	-130	A
Single Pulse Avalanche Energy [3]		EAS	264	mJ
Avalanche Current		I_{AS}	-42	A
Power Dissipation [4]	T_C=25℃	P_D	37	W
Operating Junction & Storage Temperature		T_J, T_{STG}	-55~150	℃
Thermal Resistance Rating				
Thermal Resistance Junction-Ambient[1](Max).		$R_{\theta JA}$	75	℃ / W
Thermal Resistance Junction-Case[1](Max).		$R_{\theta JC}$	3.38	℃ / 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
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]	$R_{DS(ON)}$	-	-	15	mΩ	V_{GS}= -10V, I_D= -30A
		-	-	25		V_{GS}= -4.5V, I_D= -15A
Gate Resistance	R_g	-	9	18	Ω	f =1.0MHz
Total Gate Charge	Q_g	-	22	-	nC	I_D= -15A V_{DS}= -15V V_{GS}= -4.5V
Gate-Source Charge	Q_{gs}	-	8.7	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	7.2	-		
Turn-on Delay Time [2]	$T_{d(on)}$	-	8	-	nS	V_{DD}= -15V I_D= -15A V_{GS}= -10V R_G=3.3Ω
Rise Time	T_r	-	73.7	-		
Turn-off Delay Time	$T_{d(off)}$	-	61.8	-		
Fall Time	T_f	-	24.4	-		
Input Capacitance	C_{iss}	-	2215	-	pF	V_{GS} =0 V_{DS}= -15V f =1.0MHz
Output Capacitance	C_{oss}	-	310	-		
Reverse Transfer Capacitance	C_{rss}	-	237	-		
Guaranteed Avalanche Characteristics						
Single Pulse Avalanche Energy [5]	EAS	66	-	-	mJ	V_{DD}= -25V, L=0.1mH, I_{AS}= -21A
Source-Drain Diode						
Diode Forward Voltage [2]	V_{SD}	-	-	-1	V	I_S= -1A, V_{GS}=0, T_J=25℃
Continuous Source Current [1,6]	I_S	-	-	-42	A	V_D=V_G=0, Force Current
Pulsed Source Current [2,6]	I_{SM}	-	-	-130	A	
Reverse Recovery Time	T_{rr}	-	19	-	nS	I_F= -15A, dI/dt=100A/μS, T_J=25℃
Reverse Recovery Charge	Q_{rr}	-	9	-	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}= -42A
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 CURVE

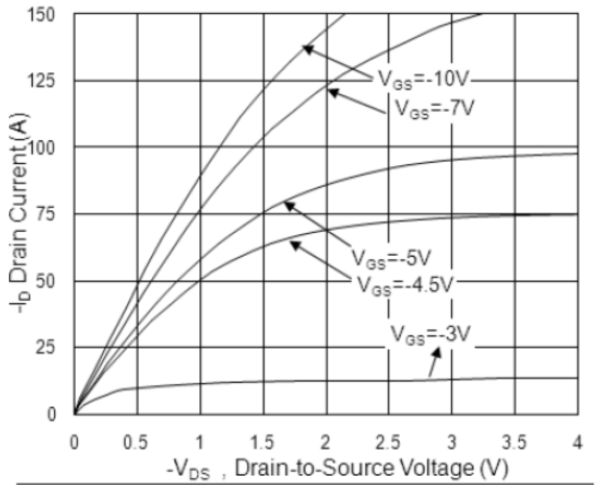


Fig.1 Typical Output Characteristics

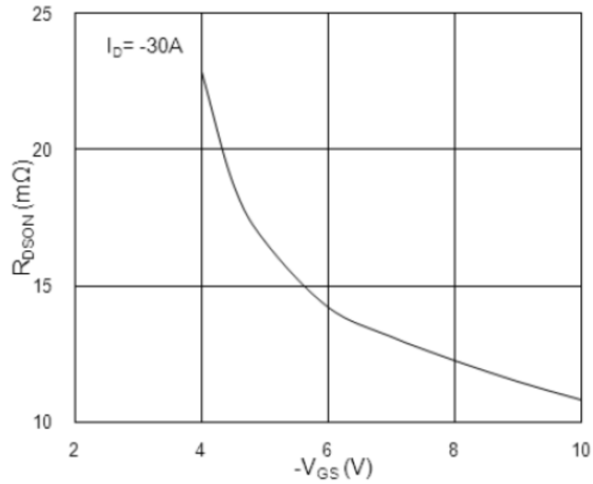


Fig.2 On-Resistance vs. G-S Voltage

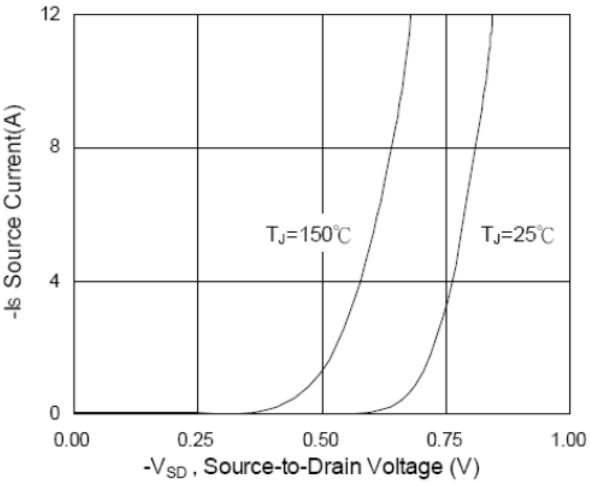


Fig.3 Forward Characteristics of Reverse

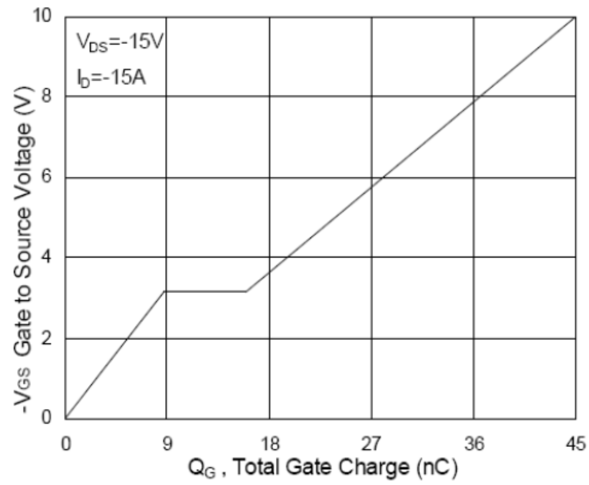


Fig.4 Gate-charge Characteristics

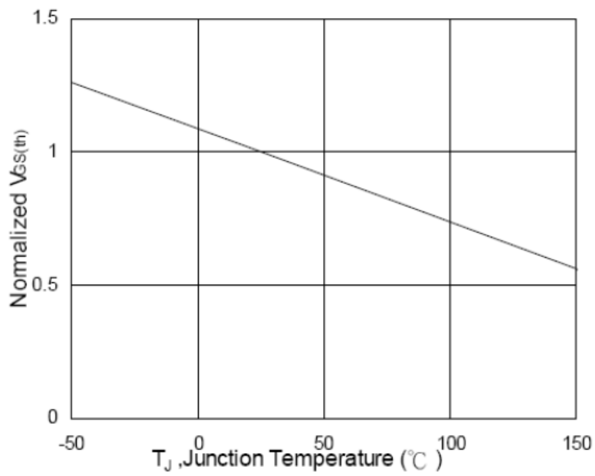


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

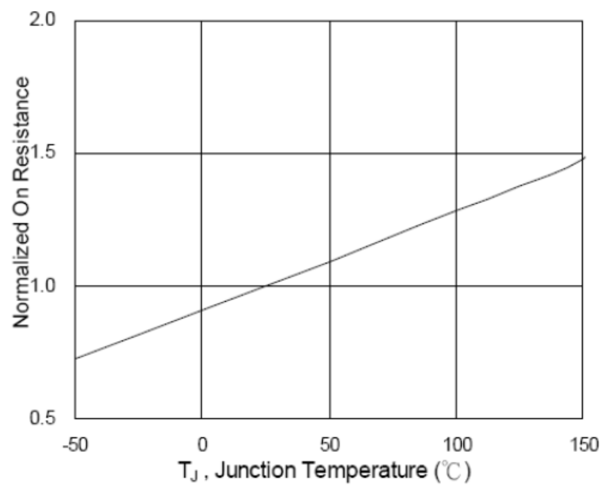


Fig.6 Normalized R_{DSON} vs. T_J

CHARACTERISTIC CURVE

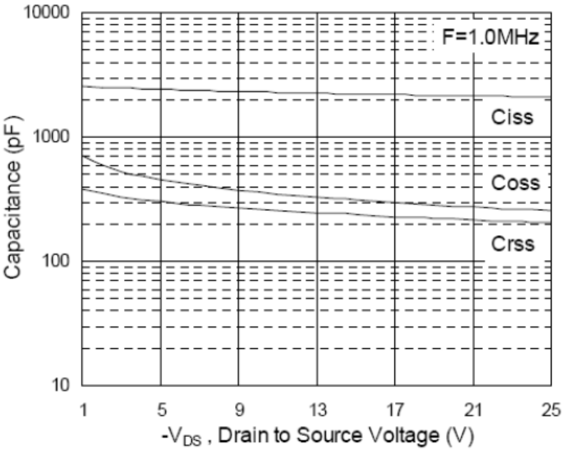


Fig.7 Capacitance

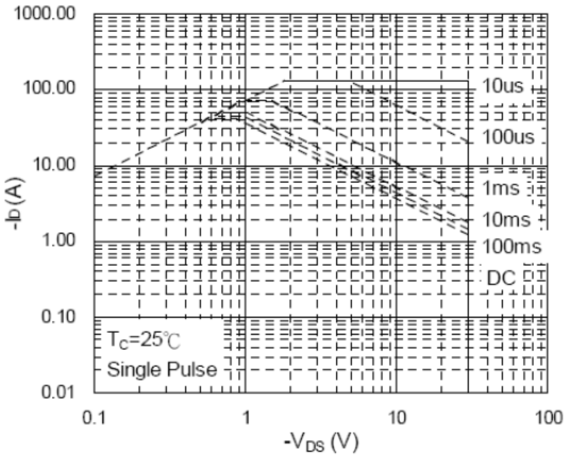


Fig.8 Safe Operating Area

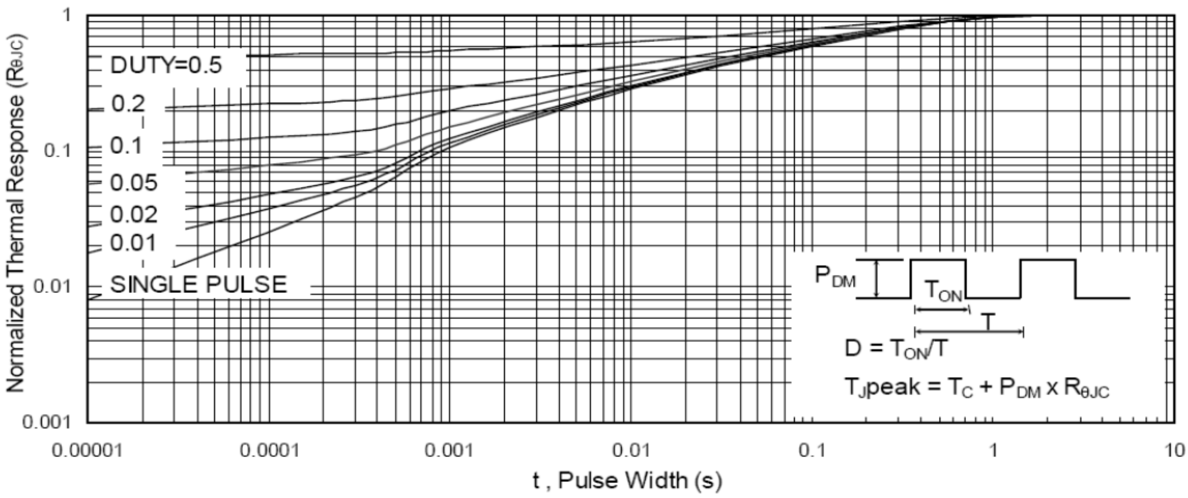


Fig.9 Normalized Maximum Transient Thermal Impedance

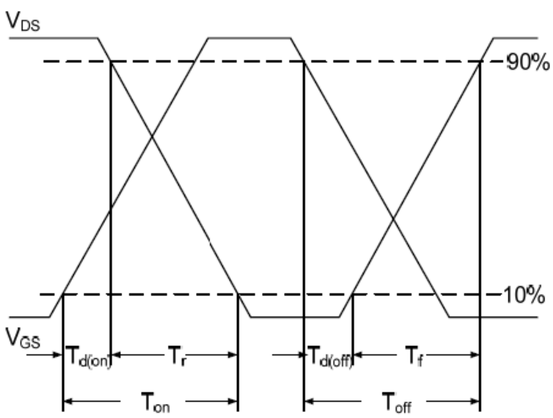


Fig.10 Switching Time Waveform

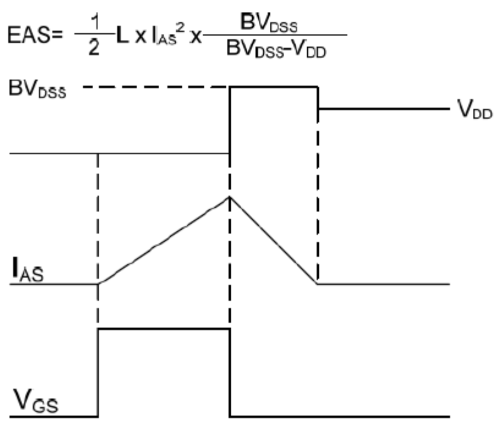


Fig.11 Unclamped Inductive Switching Wave