YEA SHIN TECHNOLOGY CO., LTD

YS100N03P

N-Channel Enhancement MOSFET

VDS= 100V, ID= 52A

DESCRIPTION

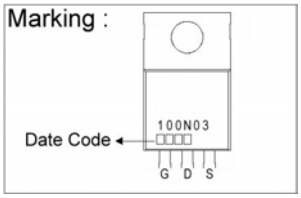
The YS100N03P is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

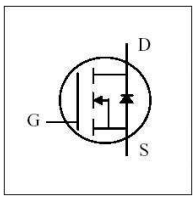
The YS100N03P meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

TO-220

FEATURES

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





Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D @T_C=25℃	52	A
	I_D @T_C=100℃	33	A
Pulsed Drain Current[1]	I_{DM}	180	A
Continuous Drain Current	I_D @T_A=25℃	7.5	A
	I_D @T_A=70℃	6	A
Total Power Dissipation	P_D @T_C=25℃	96.2	W
	P_D @T_A=25℃	2	W
Single Pulse Avalanche Energy, L=0.1mH	E_{AS}	24.2	mJ
Single Pulse Avalanche Current, L=0.1mH	I_{AS}	22	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	62	℃/W
Thermal Resistance Junction-case[2]	$R_{\theta JC}$	Steady State	1.3	℃/W

DEVICE CHARACTERISTICS

YS100N03P

Electrical Characteristics (Tj = 25℃ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0, I_D=250uA	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1.2	1.8	2.5	V
Gate-Source Leakage Current	I_{GSS}	V_{GS}= ±20V	-	-	±100	nA
Drain-Source Leakage Current	I_{DSS}	V_{DS}=80V, V_{GS}=0	-	-	1	uA
Static Drain-Source On-Resistance[1]	$R_{DS(ON)}$	V_{GS}=10V, I_D=10A	-	20	25	mΩ
		V_{GS}=4.5V, I_D=10A	-	22	28.5	
Total Gate Charge[1]	Q_g	I_D=10A V_{DS}=50V V_{GS}=10V	-	34	-	nC
Gate-Source Charge	Q_{gs}		-	6	-	
Gate-Drain (“Miller”) Change	Q_{gd}		-	9	-	
Turn-on Delay Time[1]	$T_{d(on)}$	V_{DS}=50V V_{GS}=10V R_G=3Ω R_L=5Ω	-	7	-	ns
Rise Time	T_r		-	7	-	
Turn-off Delay Time	$T_{d(off)}$		-	29	-	
Fall Time	T_f		-	7	-	
Input Capacitance	C_{iss}	V_{GS}=0V V_{DS}=30V f=1.0MHz	-	1325	-	pF
Output Capacitance	C_{oss}		-	110	-	
Reverse Transfer Capacitance	C_{rss}		-	64	-	

Guaranteed Avalanche Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Single Pulse Avalanche Energy[3]	EAS	V_{DD}=50V, L=0.1mH, I_{AS}=16A	12.8	-	-	mJ

Source-Drain Diode

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Diode Forward Voltage[1]	V_{SD}	I_S=10A, V_{GS}=0V	-	-	1.3	V
Reverse Recovery Time	t_{rr}	I_F=10A, dI/dt=100A/μs, T_J=25℃	-	32	-	ns
Reverse Recovery Charge	Q_{rr}		-	200	-	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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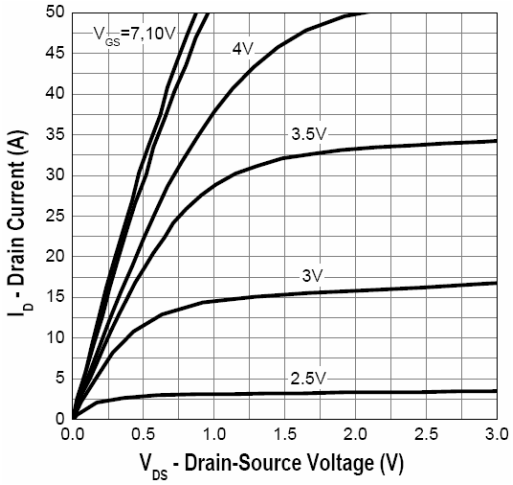


Fig.1 Typical Output Characteristics

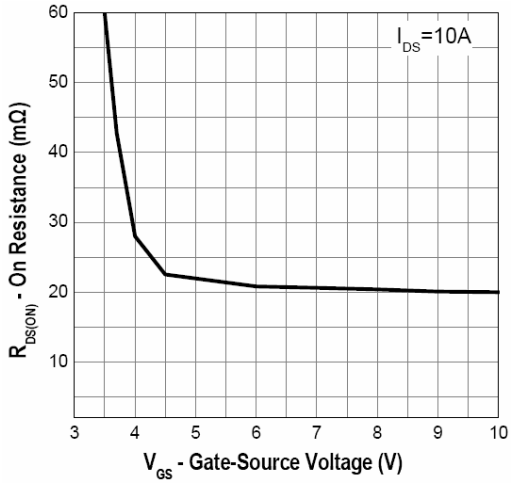


Fig.2 On-Resistance vs. G-S Voltage

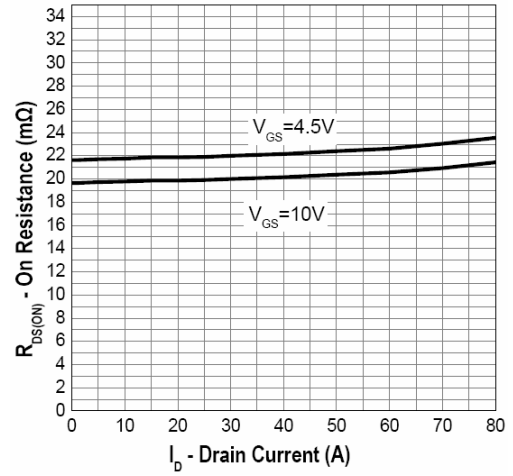


Fig.3 On-Resistance vs. Drain Current

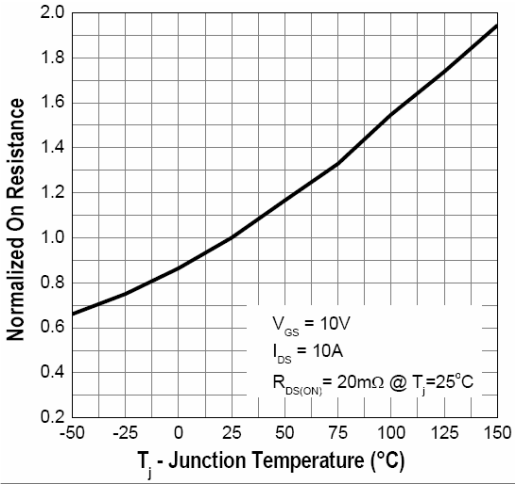


Fig.4 Normalized R_{DSON} vs. T_J

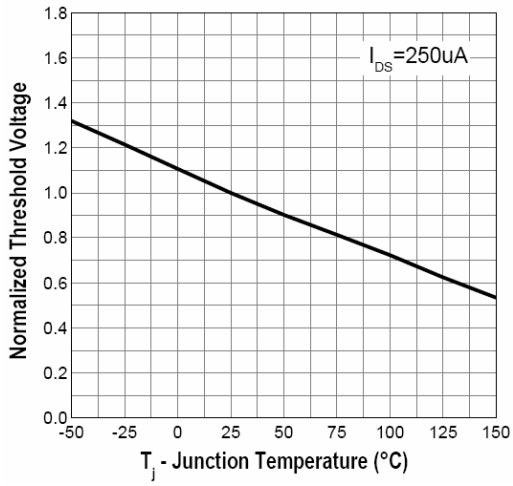


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

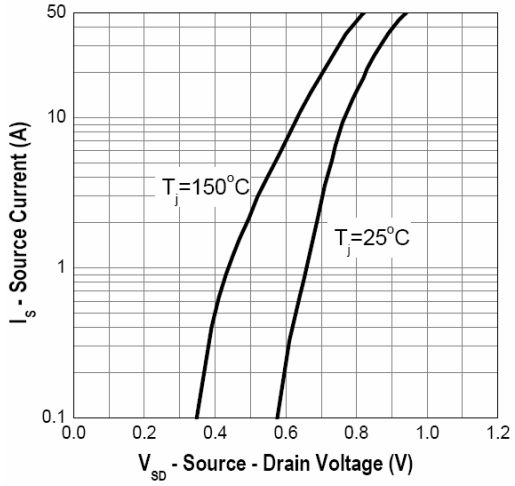


Fig.6 Forward Characteristics of Reverse

DEVICE CHARACTERISTICS

YS100N03P

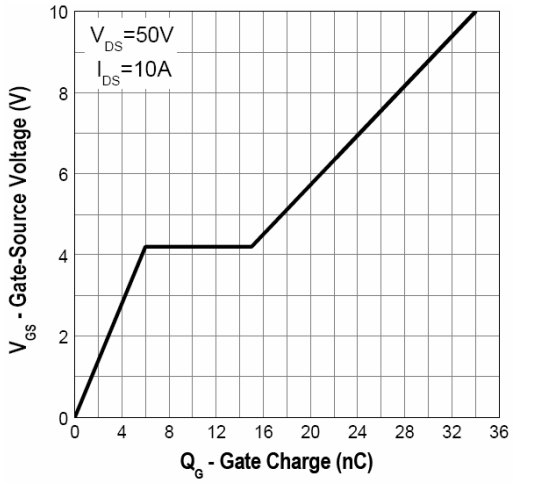


Fig.7 Gate Charge Characteristics

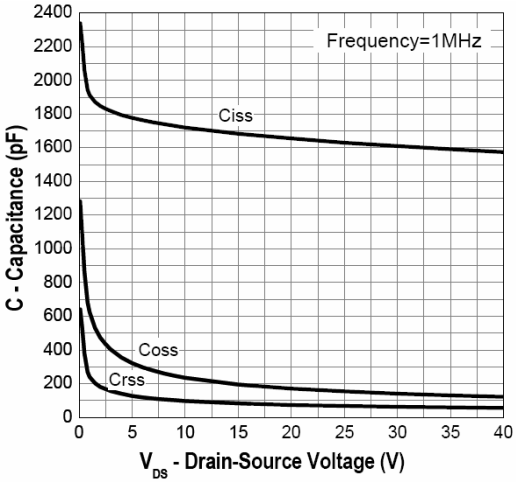


Fig.8 Capacitance Characteristics

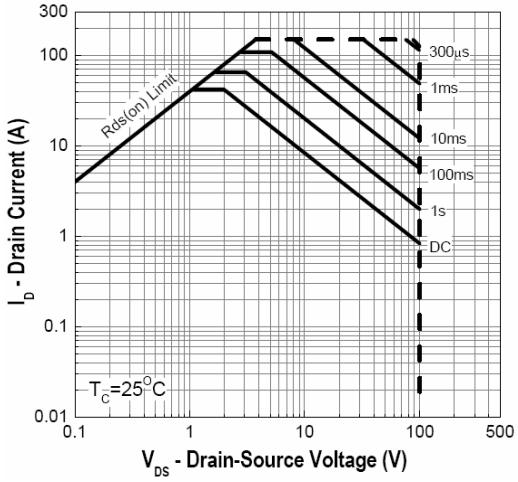


Fig.9 Safe Operating Area

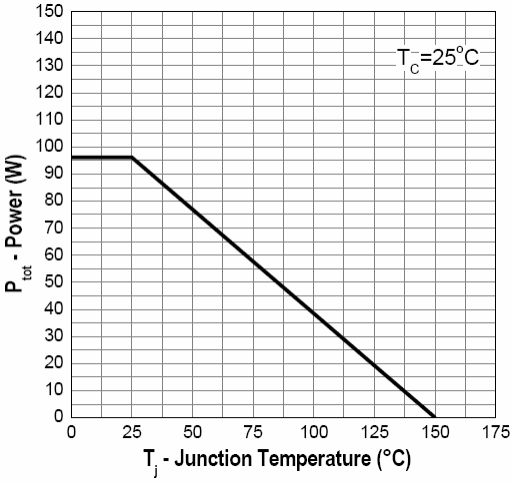


Fig.10 Power Dissipation

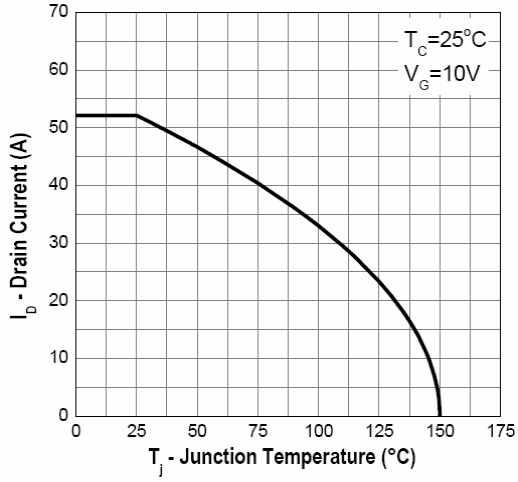


Fig.11 Drain Current vs. T_J

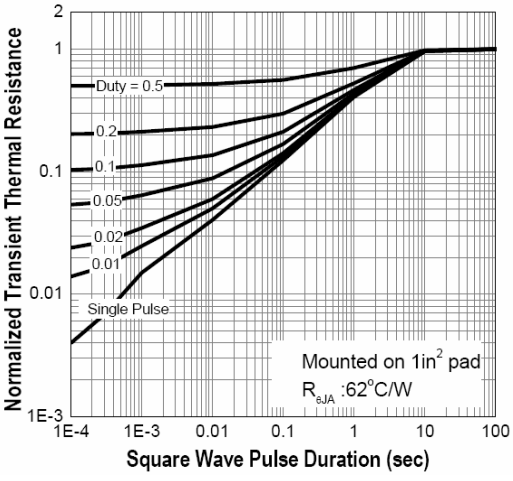
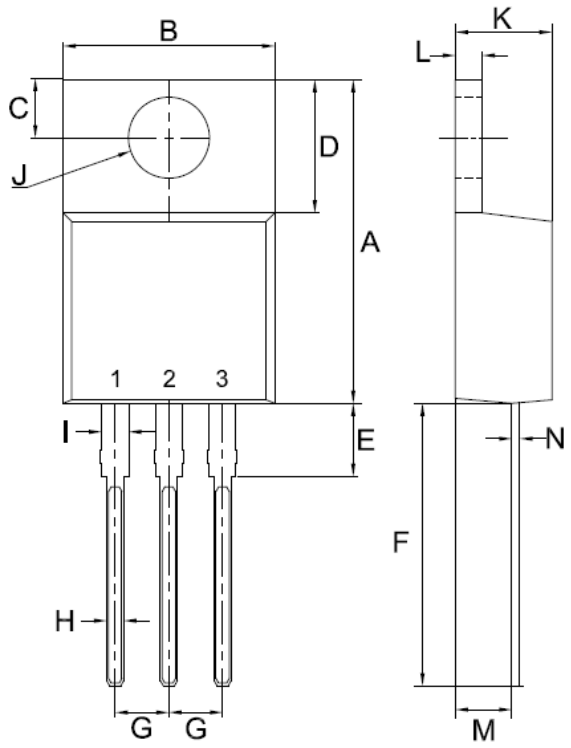


Fig.12 Transient Thermal Impedance

PACKAGE OUTLINE & DIMENSIONS

YS100N03P

TO-220 Mechanical Drawing



	TO-220 Unit : mm		
	min	typ	max
A	14.5		16.2
B	9.5		10.57
C	2.54		3
D	5.8		7.3
E	2.95		4.5
F	12.7		14
G	2.34		2.75
H	0.3		1.11
I	0.9		1.75
J	3.2		4.14
K	4.24		4.87
L	1		1.5
M	1.09		2.92
N	0.3		0.68