YEA SHIN TECHNOLOGY CO., LTD

YS15P03M

P-Channel Enhancement MOSFET

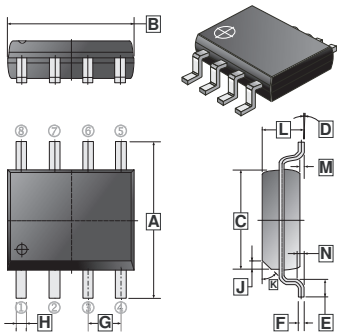
VDS= -30V, ID= -15A

SOP-8

DESCRIPTION

The YS15P03M is the highest performance trench P-ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the the synchronous buck converter applications.

The YS15P03M meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

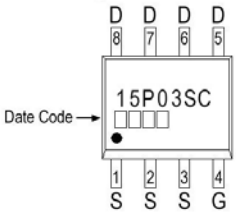


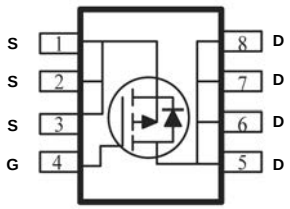
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.79	6.20	H	0.33	0.51
B	4.70	5.11	J	0.375 REF.	
C	3.70	4.10	K	45°REF.	
D	0°	8°	L	1.30	1.752
E	0.38	1.27	M	0.10	0.25
F	0.10	0.26	N	0.25 REF.	
G	1.27 TYP.				

FEATURES

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

Marking :





MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1]	I_D @T_C=25℃	-15	A
	I_D @T_C=70℃	-12	A
Pulsed Drain Current[2]	I_{DM}	-31	A
Continuous Drain Current	I_D @T_A=25℃	-8.6	A
	I_D @T_A=70℃	-6.9	A
Single Pulse Avalanche Energy, L=0.1mH[3]	E_{AS}	105	mJ
Single Pulse Avalanche Current, L=0.1mH[3]	I_{AS}	-46	A
Total Power Dissipation	P_D @T_C=25℃	4.5	W
	P_D @T_A=25℃	1.5	W
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	85	℃/W
Thermal Resistance Junction-ambient[2]	$R_{\theta JC}$	Steady State	28	℃/W

DEVICE CHARACTERISTICS

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ELECTRICAL CHARACTERISTICS (T_J = 25°C 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	$V_{GS(th)}$	-1.0	-1.65	-2.5	V	V_{DS}=V_{GS}, I_D=-250uA
Forward Transconductance	g_{fs}	-	24	-	S	V_{DS}=-5V, I_D=-10A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	-1	uA	V_{DS}=-24V, V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	-	10	12	mΩ	V_{GS}=-10V, I_D=-12A
		-	16	20		V_{GS}=-4.5V, I_D=-8A
Total Gate Charge[2]	Q_g	-	21.5	-	nC	I_D=-12A V_{DS}=-15V V_{GS}=-4.5V
Gate-Source Charge	Q_{gs}	-	8.5	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	7	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	7.84	-	ns	V_{DD}=-15V I_D=-1A V_{GS}=-10V R_G=3.3Ω
Rise Time	T_r	-	72.2	-		
Turn-off Delay Time	$T_{d(off)}$	-	60.5	-		
Fall Time	T_f	-	23.9	-		
Input Capacitance	C_{iss}	-	2129	-	pF	V_{GS}=0V V_{DS}=-15V f=1.0MHz
Output Capacitance	C_{oss}	-	298	-		
Reverse Transfer Capacitance	C_{rss}	-	227	-		
Gate Resistance	R_g	-	9	-	Ω	f=1.0MHz

Guaranteed Avalanche Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Single Pulse Avalanche Energy[5]	EAS	54	-	-	mJ	V_{DD}=-25V, L=0.1mH, I_{AS}=-33A

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage	V_{SD}	-	-	-1.0	V	I_S=-1A, V_{GS}=0V, T_J=25℃
Continuous Source Current[2,4]	I_S	-	-	-15	A	V_G=V_D=0V, Force Current
Pulsed Source Current[2,4]	I_{SM}	-	-	-31	A	
Reverse Recovery Time	t_{rr}	-	16.3	-	ns	I_F=-6A, dI/dt=100A/μs, T_J=25℃
Reverse Recovery Charge	Q_{rr}	-	5.9	-	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.

4. The data is theoretically the same as ID and IDM, in real applications, should be limited by total power dissipation.

DEVICE CHARACTERISTICS

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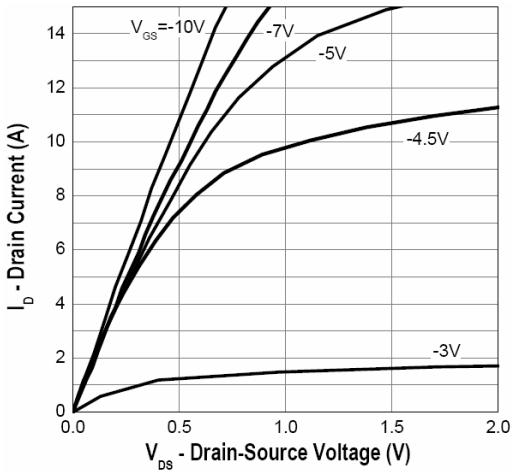

Fig.1 Typical Output Characteristics

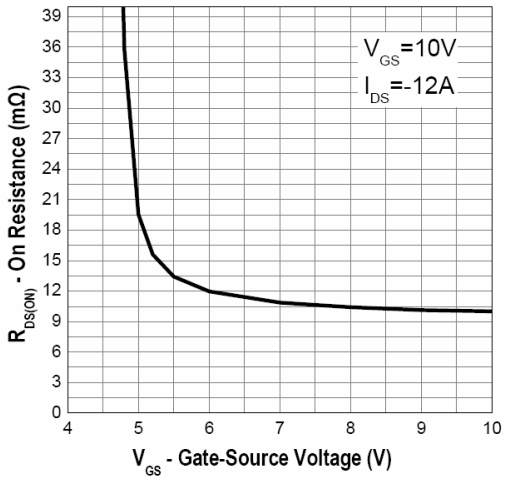

Fig.2 On-Resistance vs. G-S Voltage

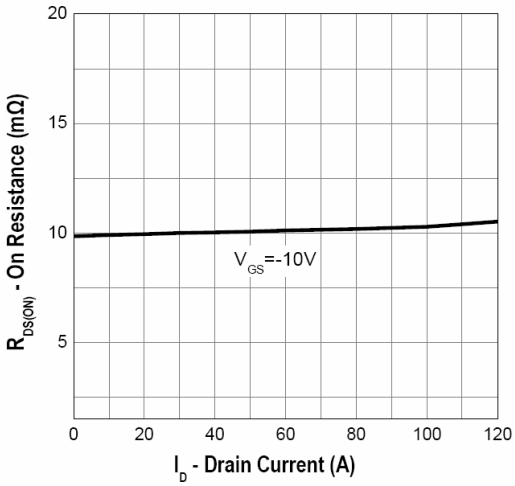

Fig.3 On-Resistance vs. Drain Current

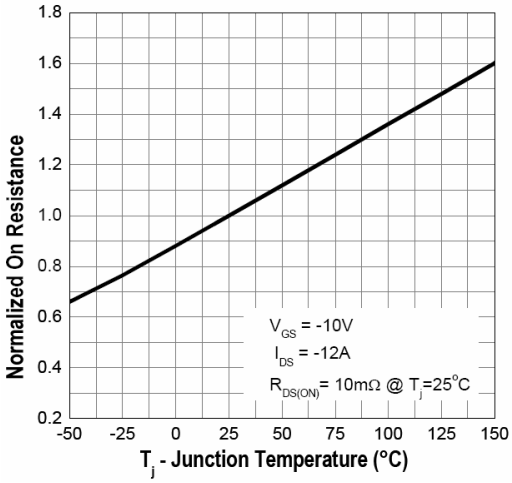

Fig.4 Normalized R_{DSON} vs. T_J

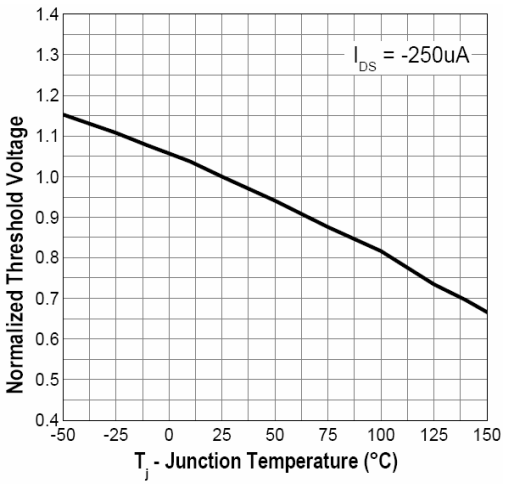

Fig.5 Normalized $V_{GS(th)}$ vs. T_J

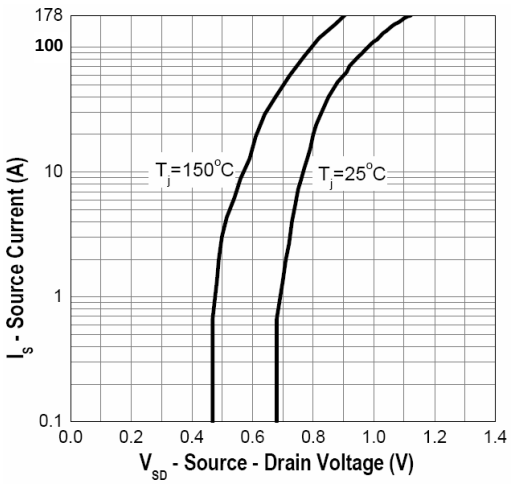

Fig.6 Forward Characteristics of Reverse

DEVICE CHARACTERISTICS

YS15P03M

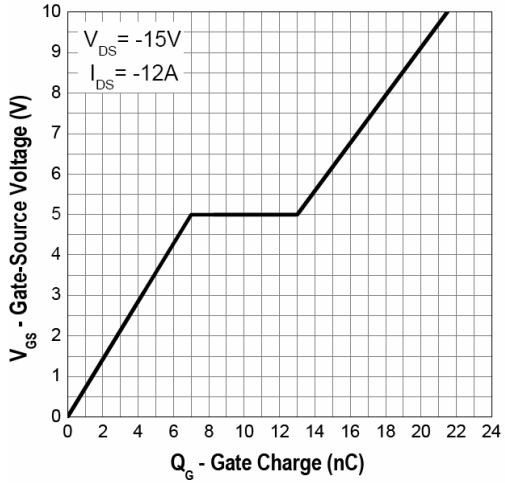

Fig.7 Gate Charge Characteristics

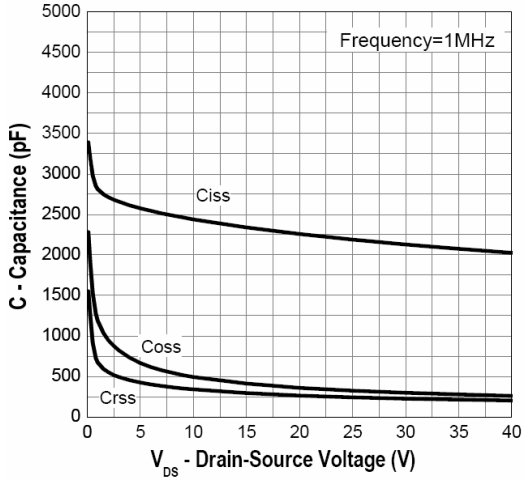

Fig.8 Capacitance Characteristics

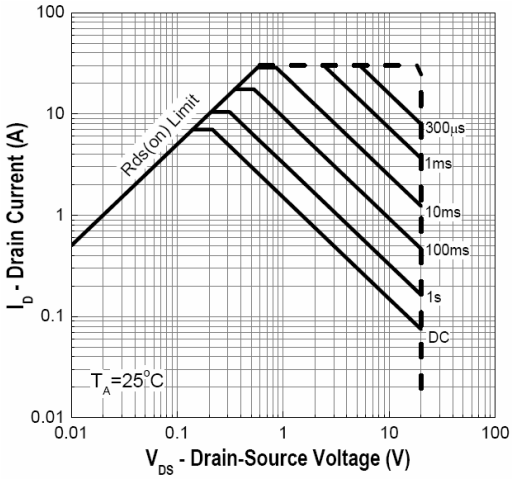

Fig.9 Safe Operating Area

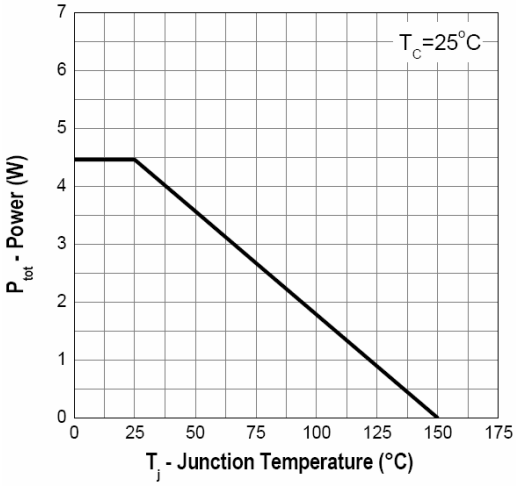

Fig.10 Power Dissipation

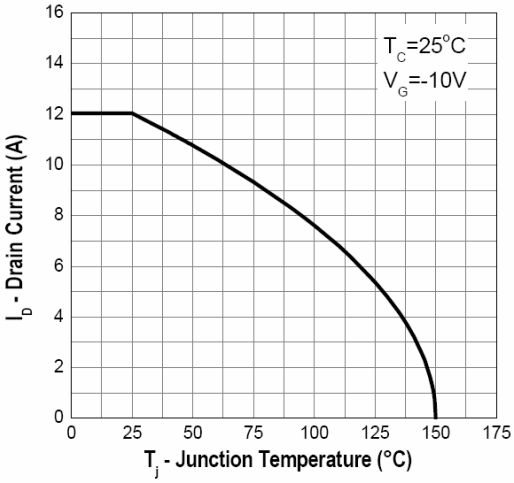

Fig.11 Drain Current vs. T_J

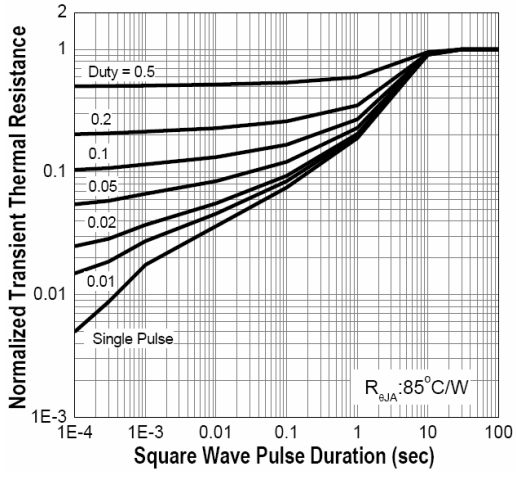

Fig.12 Transient Thermal Impedance