YEA SHIN TECHNOLOGY CO., LTD

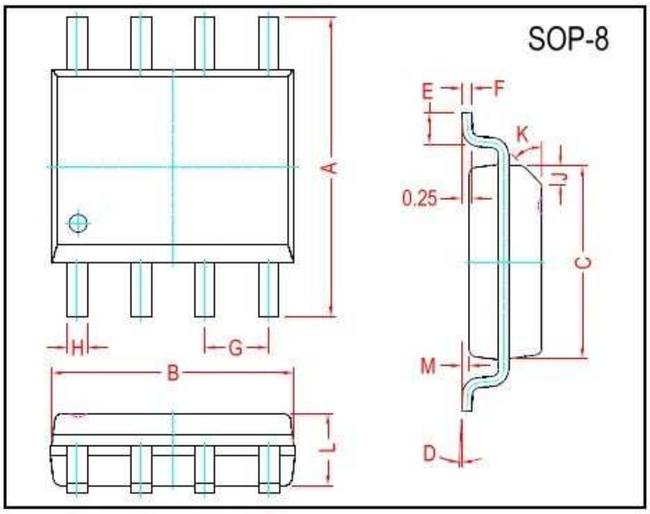
YS150N02M

N-Channel Enhancement MOSFET

VDS= 150V, ID= 4A

DESCRIPTION

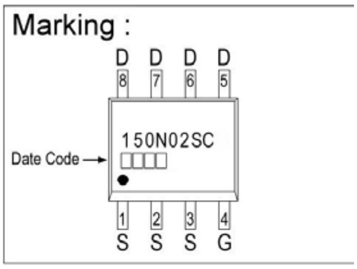
The YS150N02M is using trench DMOS technology. This advanced technology has been especially tailored to minimize $R_{DS(ON)}$, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications. The YS150N02M meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

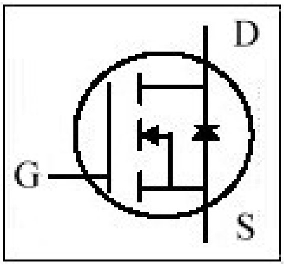


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	M	0.10	0.25
B	4.80	5.00	H	0.35	0.51
C	3.80	4.00	L	1.35	1.75
D	0°	8°	J	0.40 REF.	
E	0.40	0.90	K	45° REF	
F	0.19	0.26	G	1.27 TYP.	

FEATURES

- Advanced High Cell Density Trench Technology
- Improve dv/dt Capability
- Green Device Available
- Fast switching
- 100% EAS Guaranteed





Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±25	V
Continuous Drain Current [1]	I_D @Tc=25℃	4	A
Continuous Drain Current [1]	I_D @Tc=100℃	2.5	A
Pulsed Drain Current[1,2]	I_{DM}	16	A
Single Pulse Avalanche Energy, L=1mH[3]	E_{AS}	242	mJ
Single Pulse Avalanche Current, L=1mH[3]	I_{AS}	22	A
Total Power Dissipation[4]	P_D @TA=25℃	2.5	W
Operating Junction and Storage Temperature Range	Tj, Tstg	-50 ~ +150	℃

Thermal Data

Parameter	Symbol	Conditions	Max. Value	Unit
Thermal Resistance Junction-ambient[1]	$R_{\theta JA}$	Steady State	50	℃/W

DEVICE CHARACTERISTICS

YS150N02M

Electrical Characteristics (Tj = 25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	150	-	-	V	V_{GS}=0, I_D=250uA
Gate Threshold Voltage	$V_{GS(th)}$	2.0	3.0	4.0	V	V_{DS}=V_{GS}, I_D=250uA
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±25V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	1	uA	V_{DS}=150V, V_{GS}=0
Drain-Source Leakage Current(Tj=125℃)		-	-	10	uA	V_{DS}=120V, V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	-	52	65	mΩ	V_{GS}=10V, I_D=4A
		-	63	85		V_{GS}=6V, I_D=2A
Total Gate Charge[2]	Q_g	-	30	-	nC	I_D=4A V_{DS}=75V V_{GS}=10V
Gate-Source Charge	Q_{gs}	-	8.7	-		
Gate-Drain ("Miller") Change	Q_{gd}	-	8	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	14.5	-	ns	V_{DD}=75V I_D=1A V_{GS}=10V R_G=6Ω
Rise Time	T_r	-	19.2	-		
Turn-off Delay Time	$T_{d(off)}$	-	33.6	-		
Fall Time	T_f	-	22.8	-		
Input Capacitance	C_{iss}	-	1790	-	pF	V_{GS}=0V V_{DS}=30V f=1.0MHz
Output Capacitance	C_{oss}	-	160	-		
Reverse Transfer Capacitance	C_{rss}	-	82	-		
Gate Resistance	R_g	-	1.4	-	Ω	f=1.0MHz

Guaranteed Avalanche Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Single Pulse Avalanche Energy[5]	EAS	8	-	-	mJ	V_{DD}=50V, L=1mH, I_{AS}=4A

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Diode Forward Voltage[2]	V_{SD}	-	-	1.2	V	I_S=4A, V_{GS}=0V, T_J=25℃
Continuous Source Current[1,6]	I_S	-	-	4	A	V_G=V_D=0V, Force Current
Pulsed Source Current[2,6]	I_{SM}	-	-	8	A	

Notes: **1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.**

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

3. The EAS data shows Max. rating. The test condition is VDD=50V, VGS=10V, L=1mH, IAS=22A.

4. The power dissipation is limited by 150℃ junction 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.

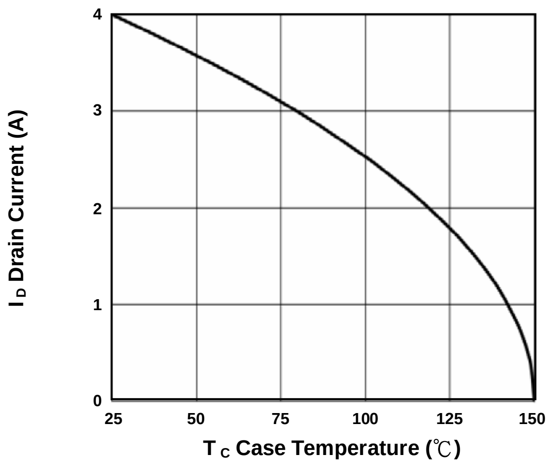


Fig.1 Drain Current vs. T_C

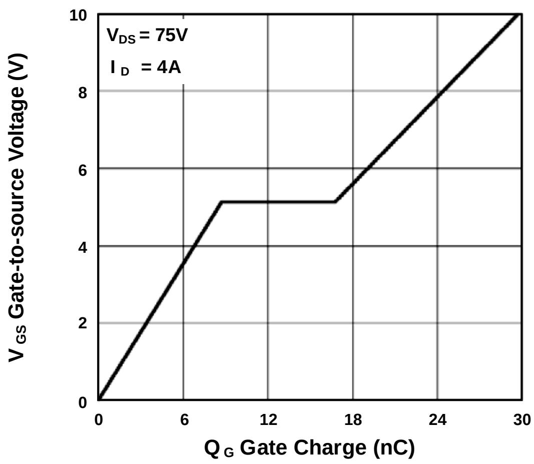


Fig.2 Gate Charge Characteristics

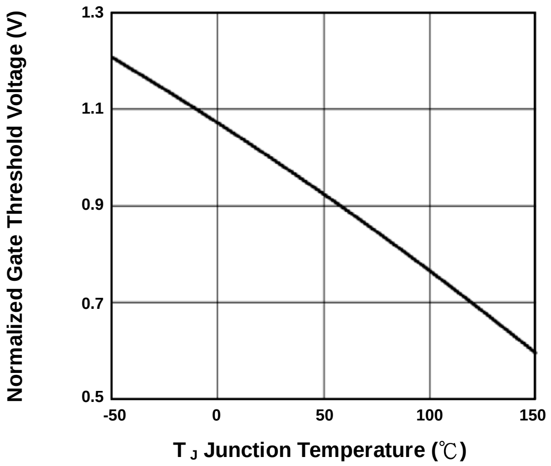


Fig.3 Normalized $V_{GS(th)}$ vs. T_J

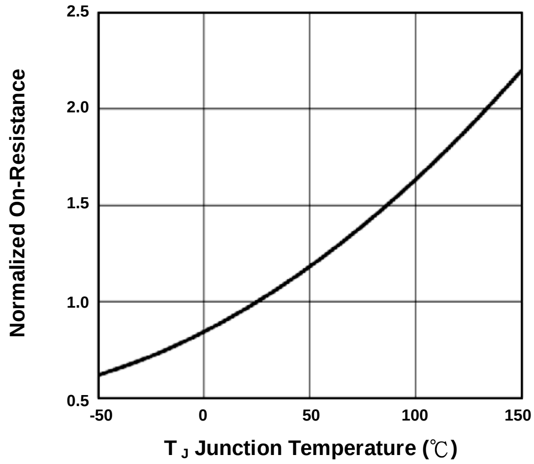


Fig.4 Normalized R_{DSON} vs. T_J

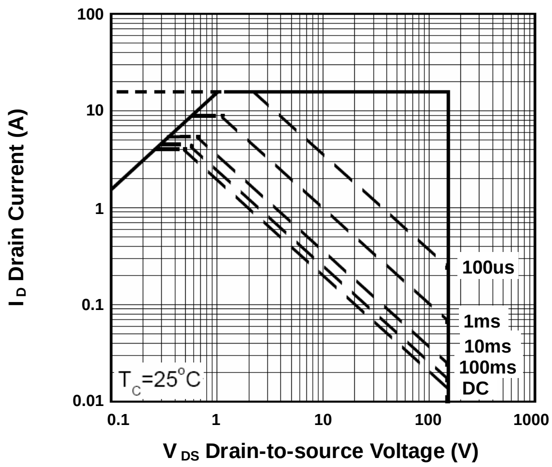


Fig.5 Safe Operating Area

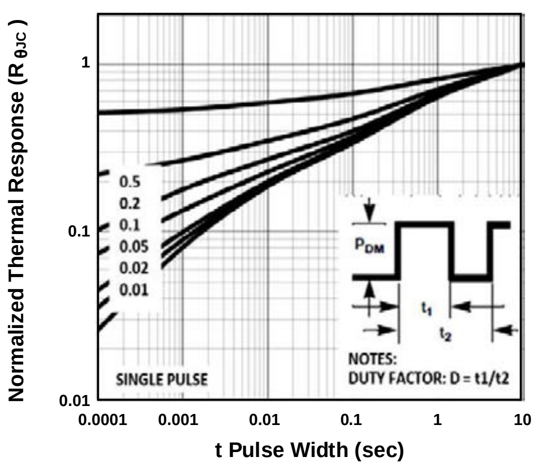


Fig.6 Transient Thermal Impedance

DEVICE CHARACTERISTICS

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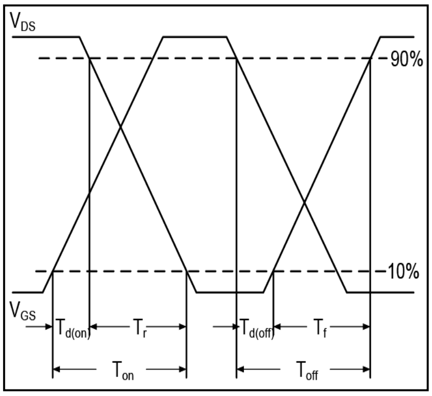

Fig.7 Switching Time Waveform

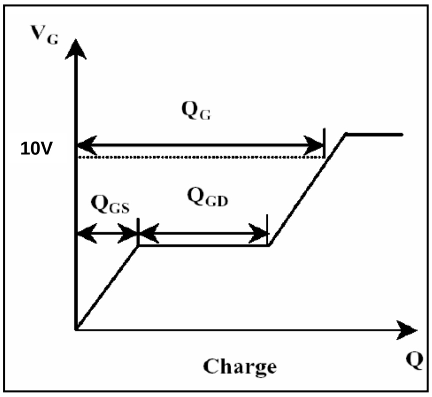

Fig.8 Gate Charge Waveform