YEA SHIN TECHNOLOGY CO., LTD YS09N10D

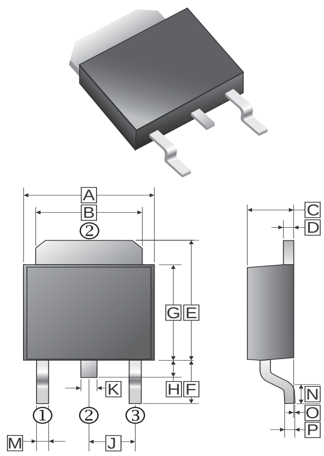
N-Channel Enhancement MOSFET

VDS= 100V, ID= 9A

DESCRIPTION

The YS09N10D 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 .

TO-252(D-Pack)



FEATURES

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

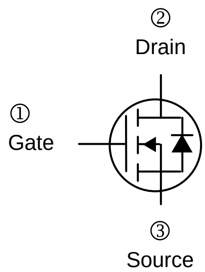
MARKING

09N10
□□□□ ← Date Code

REF.	Millimeter Min.	Millimeter Max.	REF.	Millimeter Min.	Millimeter Max.
A	6.35	6.80	J	2.30 REF.	
B	5.20	5.50	K	0.64	0.90
C	2.15	2.40	M	0.50	1.1
D	0.45	0.58	N	0.9	1.65
E	6.8	7.5	O	0	0.15
F	2.40	3.0	P	0.43	0.58
G	5.40	6.25			
H	0.64	1.20			

PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-252	2.5K	13 inch



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

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current, V_{GS}=10V [1]	T_C=25°C	I_D	9	A
	T_C=100°C		5.7	A
Pulsed Drain Current [2]		I_{DM}	18	A
Total Power Dissipation [3]	T_C=25°C	P_D	31	W
	T_A=25°C		2	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150	°C
Thermal Resistance Rating				
Maximum Thermal Resistance Junction-Case [1]		$R_{θJC}$	4	°C / W
Maximum Thermal Resistance Junction-ambient [1]		$R_{θJA}$	62	°C / W

ELECTRICAL CHARACTERISTICS (T_J=25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	100	-	-	V	V_{GS}=0, I_D=250μA
Breakdown Voltage Temperature Coefficient	△BV_{DSS}/△T_J	-	0.122	-	V/°C	Reference to 25°C, I_D=1mA
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Forward Transconductance	g_{fS}	-	19	-	S	V_{DS}=5V, I_D=8A
Drain-Source Leakage Current, T_J=25°C	I_{DSS}	-	-	1	μA	V_{DS}=80V, V_{GS}=0
Drain-Source Leakage Current, T_J=55°C		-	-	30		
Static Drain-Source On-Resistance [2]	$R_{DS(ON)}$	-	-	152	mΩ	V_{GS}=10V, I_D=8A
		-	-	158		V_{GS}=4.5V, I_D=6A
Total Gate Charge [2]	Q_g	-	25.5	-	nC	I_D=8A V_{DS}=60V V_{GS}=10V
Gate-Source Charge	Q_{gs}	-	4.2	-		
Gate-Drain ("Miller") Change	Q_{gd}	-	4.3	-		
Turn-on Delay Time [2]	$T_{d(on)}$	-	17.3	-	nS	V_{DS}=50V I_D=1A V_{GS}=10V R_D=3.3 Ω
Rise Time	T_r	-	2.8	-		
Turn-off Delay Time	$T_{d(off)}$	-	50	-		
Fall Time	T_f	-	2.8	-		
Input Capacitance	C_{iss}	-	1077	-	pF	V_{GS} =0 V_{DS}=15V f =1.0MHz
Output Capacitance	C_{oss}	-	46	-		
Reverse Transfer Capacitance	C_{rss}	-	32	-		
Gate Resistance	R_g	-	2	3	Ω	f =1.0MHz
Source-Drain Diode						
Continuous Source Current [1,4]	I_S	-	-	9	A	V_G = V_D=0, Force Current
Pulsed Source Current [2,4]	I_{SM}	-	-	18	A	
Diode Forward Voltage [2]	V_{SD}	-	-	1.2	V	I_S=1A, V_{GS}=0

Notes:

1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≦ 300us, duty cycle ≦ 2%.
3. The power dissipation is limited by 150℃ junction temperature.
4. The data is theoretically the same as ID and IDM, in real applications, should be limited by total power dissipation

DEVICE CHARACTERISTICS

YS09N10D

CHARACTERISTIC CURVES

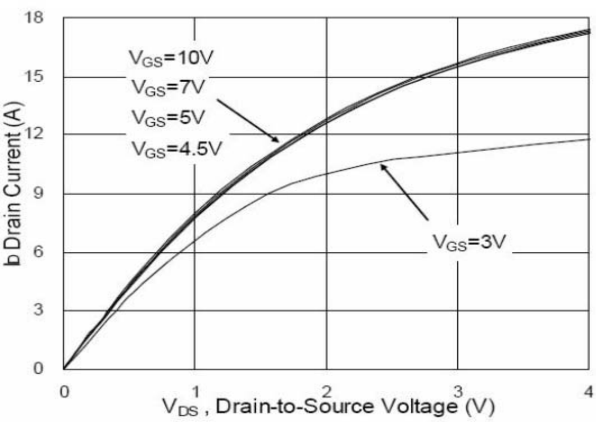


Fig.1 Typical Output Characteristics

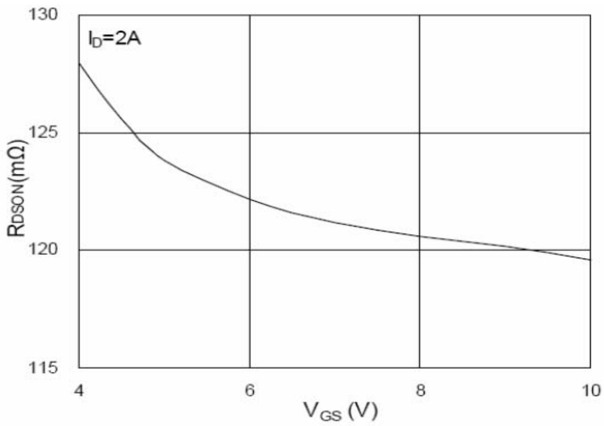


Fig.2 On-Resistance vs. Gate-Source

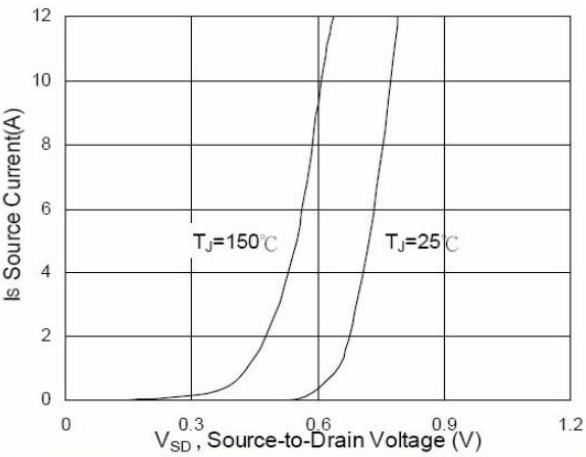


Fig.3 Forward Characteristics Of Reverse

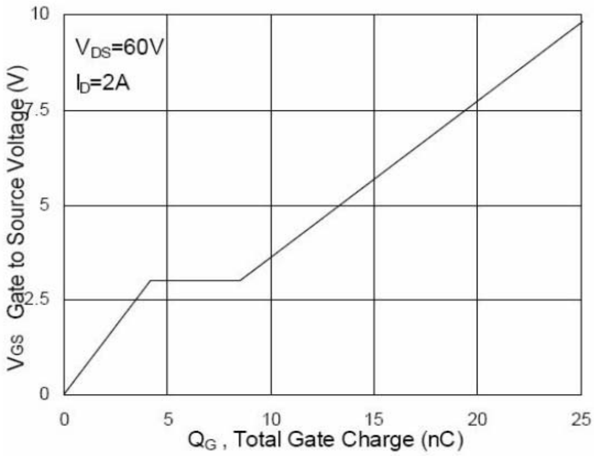


Fig.4 Gate-Charge Characteristics

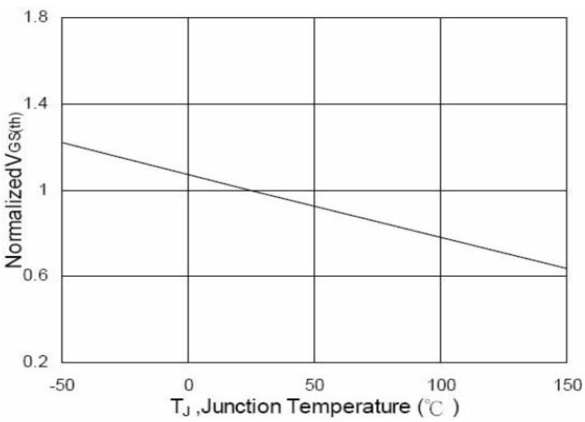


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

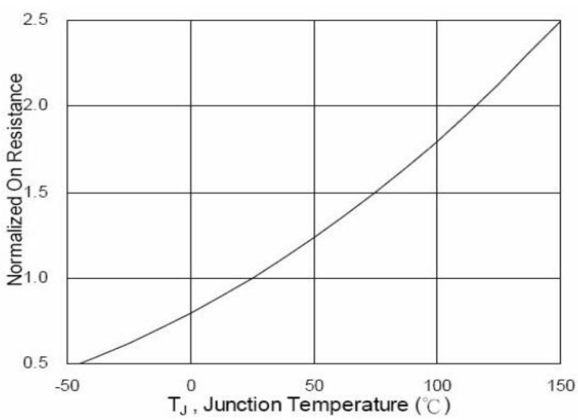


Fig.6 Normalized R_{DSON} vs. T_J

DEVICE CHARACTERISTICS

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CHARACTERISTIC CURVES

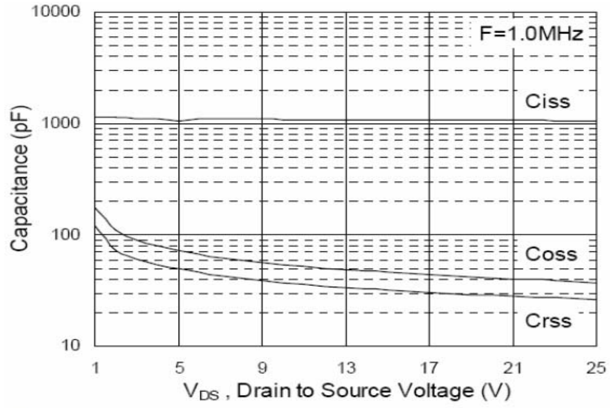

Fig.7 Capacitance

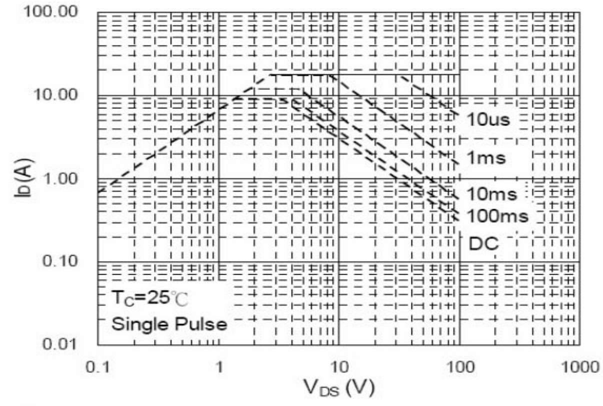

Fig.8 Safe Operating Area

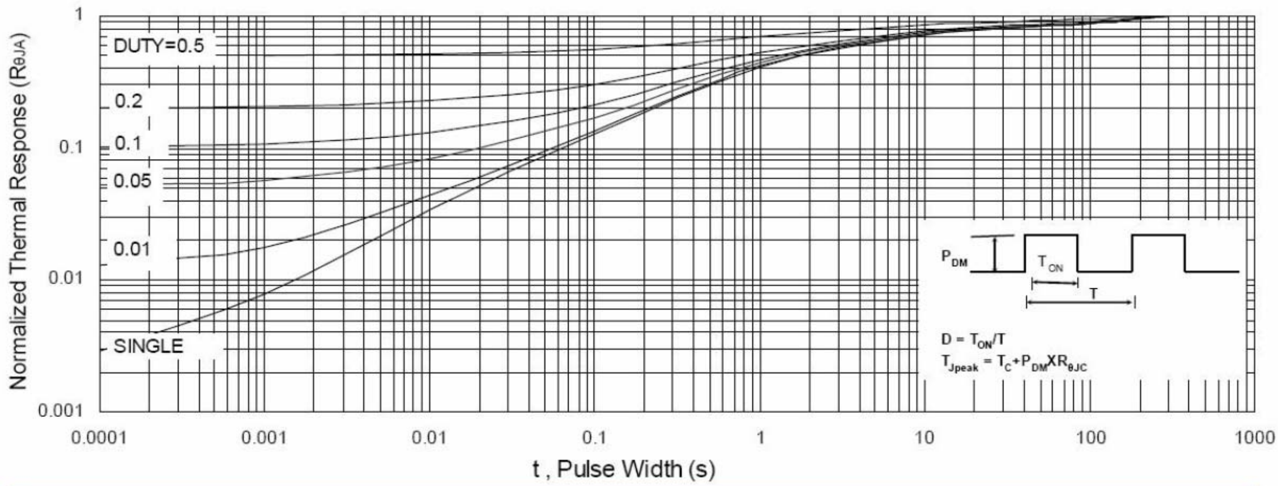

Fig.9 Normalized Maximum Transient Thermal Impedance

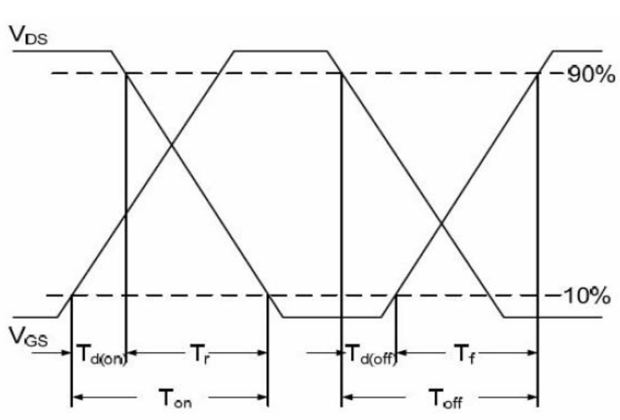

Fig.10 Switching Time Waveform

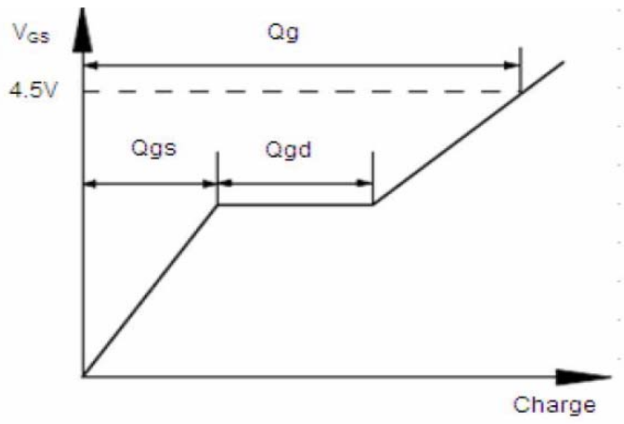

Fig.11 Gate Charge Waveform