N Channel Enhancement Mode Power MOSFET

GENERAL DESCRIPTION

The JY4N5M utilizes the latest planar processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

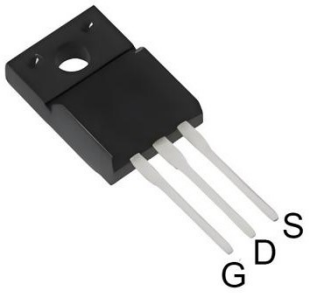
FEATURES

- 500V/4A, $R_{DS(ON)}$ =2.0Ω@V_{GS}=10V
- Fast switching and reverse body recovery
- Excellent package for good heat dissipation

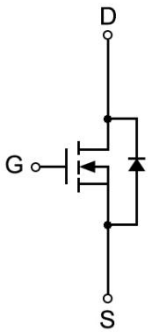
APPLICATIONS

- Lighting
- High efficiency switch mode power supplies

PIN DESCRIPTION



TO-220F



N-Channel MOSFET

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Absolute Maximum Ratings(Tc=25ºC Unless Otherwise Noted)

Symbol	Parameter		Limit	Unit
V_{DS}	Drain-Source Voltage		500	V
V_{GS}	Gate-Source Voltage		±30	V
I_D	Continuous Drain Current	Tc=25° C	4	A
		Tc=100° C	2.8	
I_{DM}	Pulsed Drain Current		16	A
P_D	Maximum Power Dissipation		30	W
T_J T_{STG}	Operating Junction and Storage Temperature Range		-55+150	℃
$R_{\theta JC}$	Thermal Resistance-Junction to Case		4.16	℃/W

Electrical Characteristics(Tc=25ºC Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_{DS}=250uA	500	525		V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=500V,V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±30V,V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_{DS}=250uA	2.0		4.0	V
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V,I_{DS}=2A		2.0	2.1	Ω

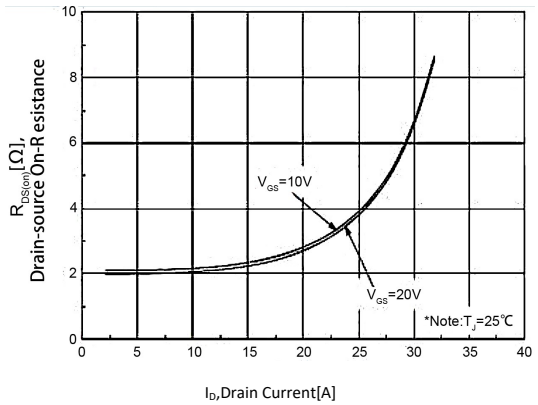
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Electrical Characteristics(Tc=25ºC Unless Otherwise Noted)

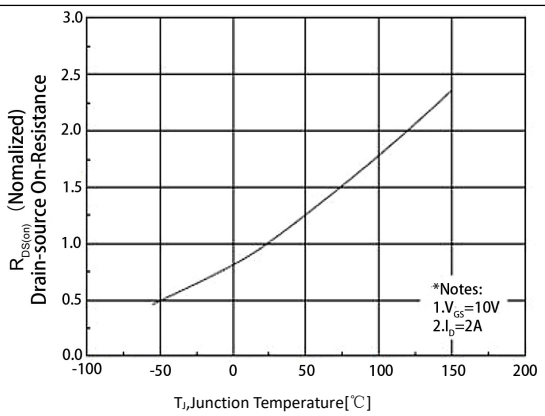
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_{SD}=4A			1.3	V
Trr	Reverse Recovery Time	I_{SD}=4A di/dt=100A/us		515		ns
Qrr	Reverse Recovery Charge			6.2		μC
Dynamic Characteristics						
$T_{d(on)}$	Turn-on Delay Time	V_{DS}=250V, R_G=25Ω, I_{DS}=2A,V_{GS}=10V,		41		ns
Tr	Turn-on Rise Time			45		
$T_{d(off)}$	Turn-off Delay Time			332		
T_f	Turn-off Fall Time			90		
C_{ISS}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		3082		pF
C_{OSS}	Output Capacitance			352		
C_{RSS}	Reverse Transfer Capacitance			15		
Q_g	Total Gate Charge	V_{DS}=400V,I_D=2A, V_{GS}=10V		74		nC
Q_{gs}	Gate-Source Charge			15		
Q_{gd}	Gate-Drain Charge			32		

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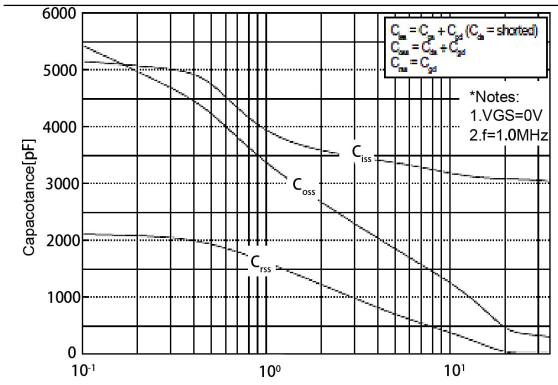
Typical electrical and thermal characteristics



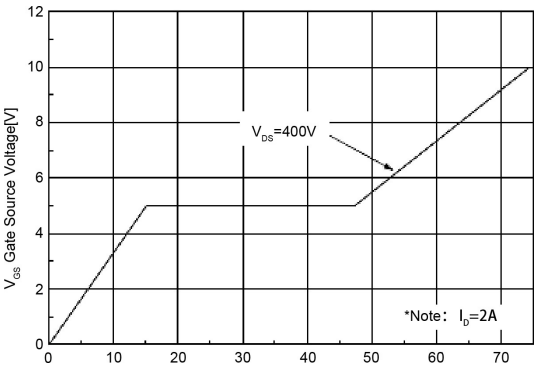
On-Resistance Variation vs Drain Current and Gate Voltage



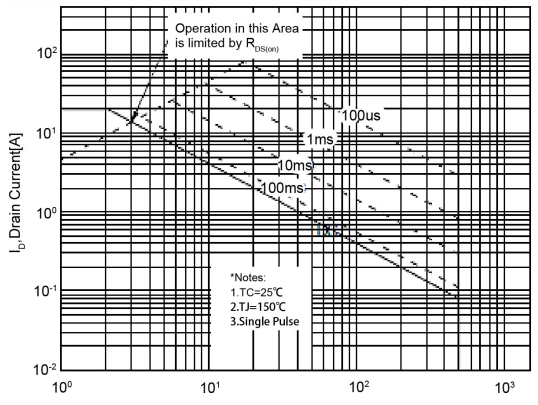
On-Resistance Variation vs Temperature



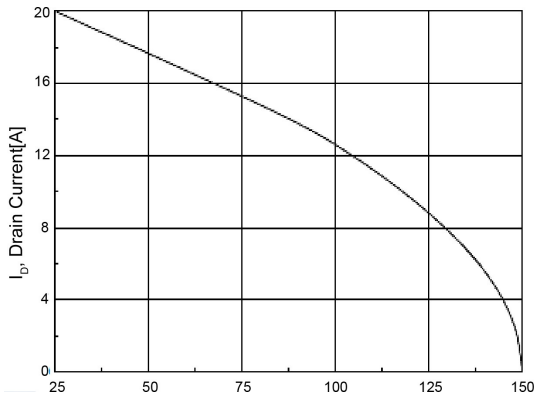
Capacitance Characteristics



Gate Charge Characteristics



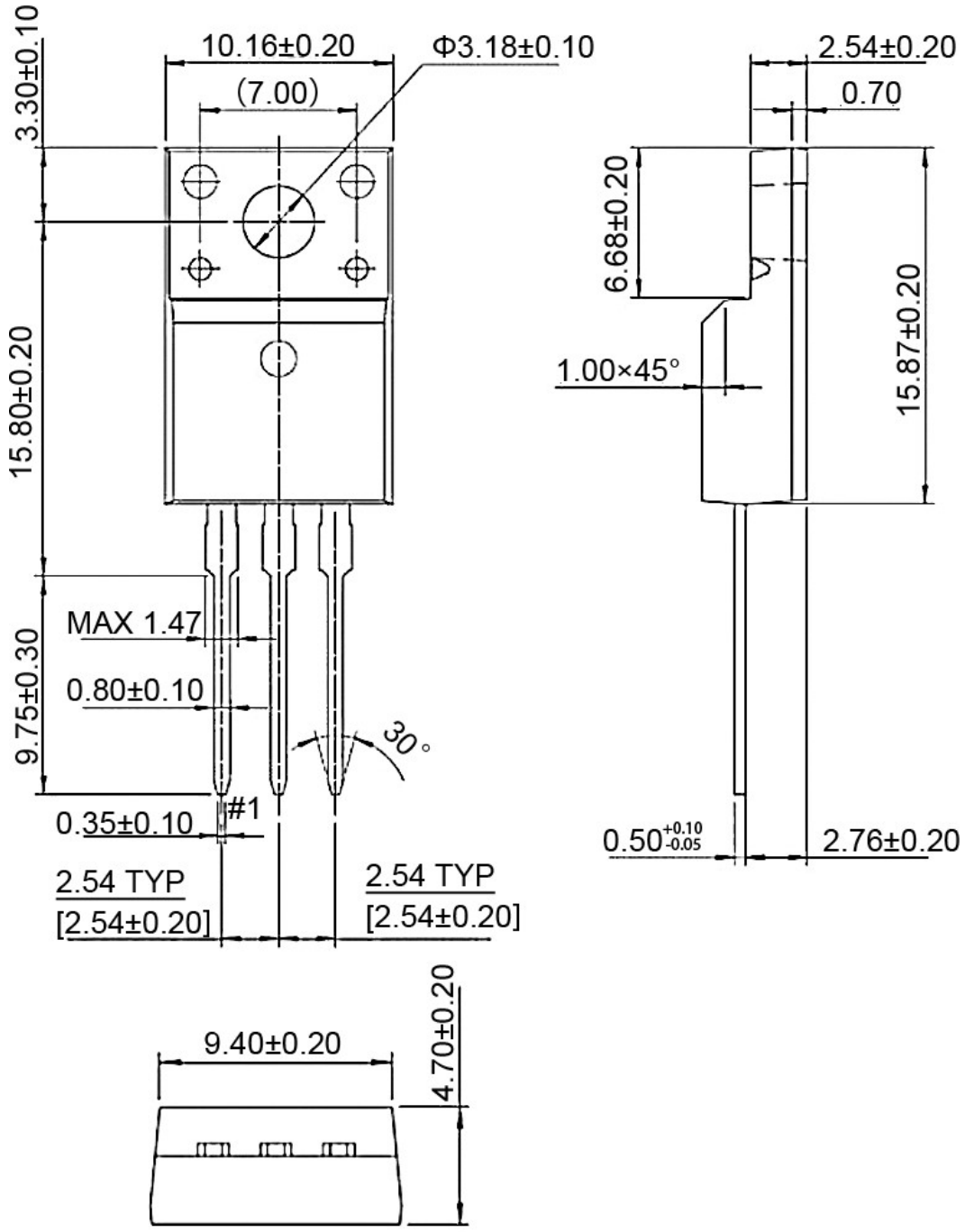
Maximum Safe Operating Area



Maximum Drain Current vs Case Temperature

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TO220F-3 Package Outline



Dimensions in Millimeters