N Channel Enhancement Mode Power MOSFET

GENERAL DESCRIPTION

The JY09M utilizes the latest trench processing techniques to achieve the high cell density and reduces the on-resistance with low gate charge. 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.

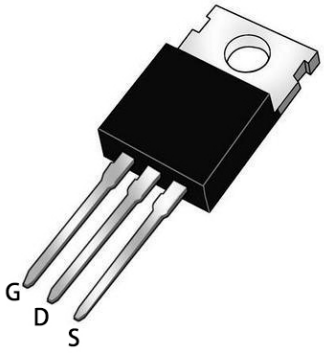
FEATURES

- 70V/90A, RDS(ON) =6.8mΩ@VGS=10V(typical)
- Fast switching and reverse body recovery
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

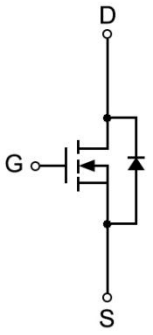
APPLICATIONS

- Power Switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

PIN DESCRIPTION



TO-220



N-Channel MOSFET

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

Symbol	Parameter		Limit	Unit
V_{DS}	Drain-Source Voltage		70	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	Tc=25° C	90	A
		Tc=100° C	65	
I_{DM}	Pulsed Drain Current		315	A
P_D	Maximum Power Dissipation		165	W
T_J T_{STG}	Operating Junction and Storage Temperature Range		-55+175	℃
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.85	℃/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	℃/W

Electrical Characteristics(Ta=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	70			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=70V,V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_{DS}=250uA	2		4	V
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V,I_{DS}=30A		6.0	6.8	mΩ

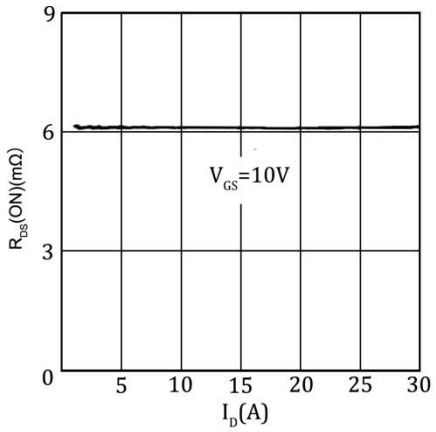
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Electrical Characteristics(Ta=25ºC Unless Otherwise Noted)

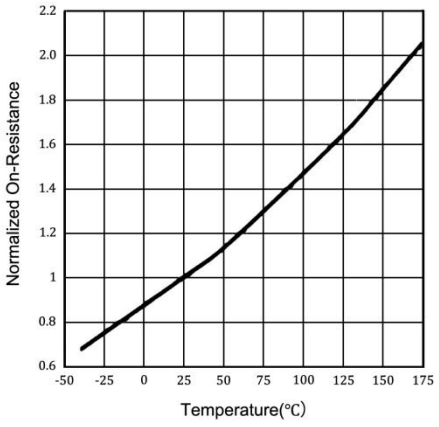
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_{SD}=30A			1.3	V
Trr	Reverse Recovery Time	I_{SD}=30A di/dt=100A/us		35		ns
Qrr	Reverse Recovery Charge			50		nC
Dynamic Characteristics						
$T_{d(on)}$	Turn-on Delay Time	V_{DS}=30V, R_G=3Ω, I_{DS}=30A,V_{GS}=10V ,		15		ns
Tr	Turn-on Rise Time			12		
$T_{d(off)}$	Turn-off Delay Time			50		
T_f	Turn-off Fall Time			14		
C_{ISS}	Input Capacitance	V_{GS}=0V, V_{DS}=30V, f=1.0MHz		3215		pF
C_{OSS}	Output Capacitance			345		
C_{RSS}	Reverse Transfer Capacitance			230		
Q_g	Total Gate Charge	V_{DS}=30V,I_D=30A, V_{GS}=10V		86		nC
Q_{gs}	Gate-Source Charge			19		
Q_{gd}	Gate-Drain Charge			25		

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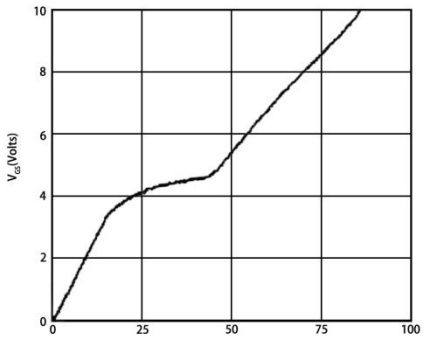
Typical electrical and thermal characteristics



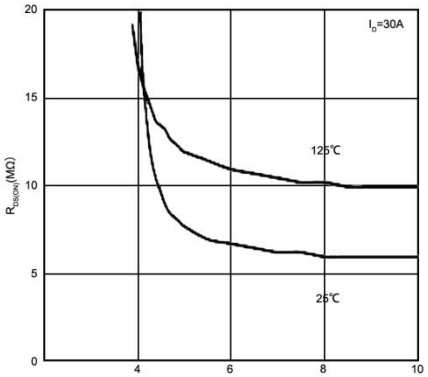
On-Resistance VS.Drain Current and Gate Voltage



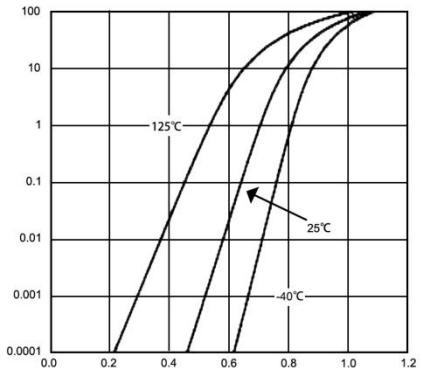
On-Resistance vs.Junction Temperature



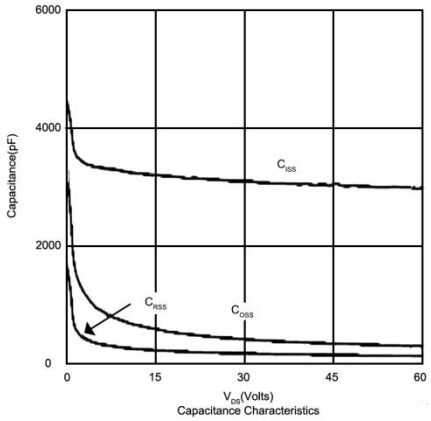
Gate-Charge Characteristice



On-Resistance vs.Gate-source Voltage

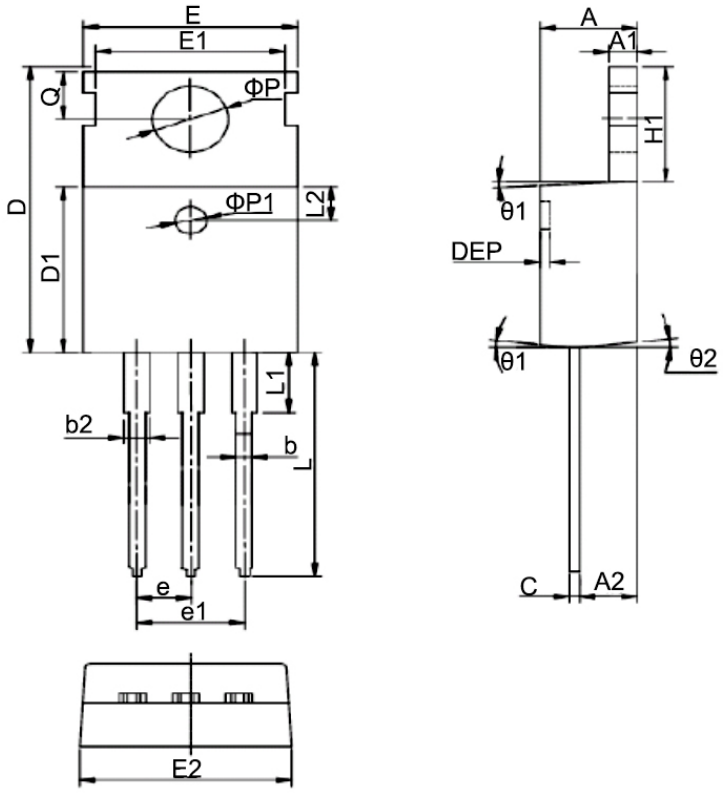


Body-Diode Characteristics



Capacitance Characteristics

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SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185	Φp1	1.40	1.50	1.60	0.055	0.059	0.063
A1	1.27	1.30	1.33	0.050	0.051	0.052	e	2.54BSC			0.1BSC		
A2	2.35	2.40	2.50	0.093	0.094	0.098	e1	5.08BSC			0.2BSC		
b	0.77	-	0.90	0.030	-	0.035	H1	6.40	6.50	6.60	0.252	0.256	0.260
b2	1.23	-	1.36	0.048	-	0.054	L	12.75	-	13.17	0.502	-	0.519
C	0.48	0.50	0.52	0.019	0.020	0.021	L1	-	-	3.95	-	-	0.156
D	15.40	15.60	15.80	0.606	0.614	0.622	L2	2.50REF			0.098REF		
D1	9.00	9.10	9.20	0.354	0.358	0.362	Φp	3.57	3.6	3.63	0.141	0.142	0.143
DEP	0.05	0.10	0.20	0.002	0.004	0.008	Q	2.73	2.80	2.87	0.107	0.110	0.113
E	9.70	9.90	10.10	0.382	0.389	0.398	Θ1	5°	7°	9°	5°	7°	9°
E1	-	8.70	-	-	0.343	-	Θ2	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.401							