N Channel Enhancement Mode Power MOSFET

GENERAL DESCRIPTION

The JY11M utilizes the latest trench 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.

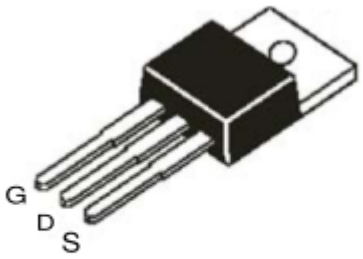
FEATURES

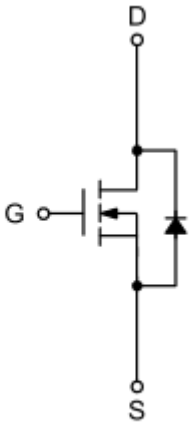
- 100V/110A, $R_{DS(ON)}$ =6.5mΩ@V_{GS}=10V
- Fast switching and reverse body recovery
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

APPLICATIONS

- Switching application
- Hard switched and high frequency circuits
- Power Management for Inverter Systems

PIN DESCRIPTION





N-Channel MOSFET

Absolute Maximum Ratings(Tc=25° C Unless Otherwise Noted)

Symbol	Parameter		Limit	Unit
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	Tc=25° C	110	A
		Tc=100° C	82	
I_{DM}	Pulsed Drain Current		395	A
P_D	Maximum Power Dissipation		210	W
T_J T_{STG}	Operating Junction and Storage Temperature Range		-55 to +175	° C
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.65	° C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62	

Electrical Characteristics(Ta=25° C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_{DS}=250uA	100			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V,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	2.0	3.0	4.0	V
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V,I_{DS}=40A		6.5		mΩ
g_{FS}	Forward Transconductance	V_{DS}=50V, I_{DS}=40A	100			S

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}=40A			1.1	V
Trr	Reverse Recovery Time	I_{SD}=40A di/dt=100A/us		45		ns
Qrr	Reverse Recovery Charge			88		nC
Dynamic Characteristics						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V, f=1MHZ		1.8		Ω
$T_{d(on)}$	Turn-on Delay Time	V_{DS}=50V, R_G=6Ω, I_{DS} =40A, V_{GS}=10V,		26		ns
Tr	Turn-on Rise Time			45		
$T_{d(off)}$	Turn-off Delay Time			70		
T_f	Turn-off Fall Time			51		
C_{ISS}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		4900		pF
C_{OSS}	Output Capacitance			585		
C_{RSS}	Reverse Transfer Capacitance			387		
Q_g	Total Gate Charge	V_{DS}=80V,I_D=40A, V_{GS}=10V		80		nC
Q_{gs}	Gate-Source Charge			20		
Q_{gd}	Gate-Drain Charge			28		

Typical electrical and thermal characteristics

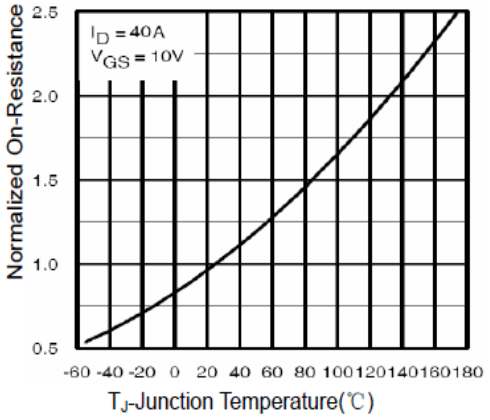


Figure1. R_{DSON}-Junction Temperature

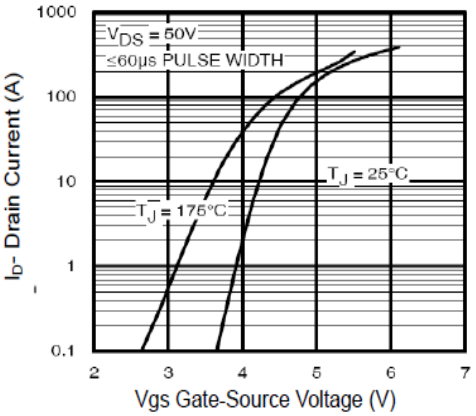


Figure2. Transfer Characteristics

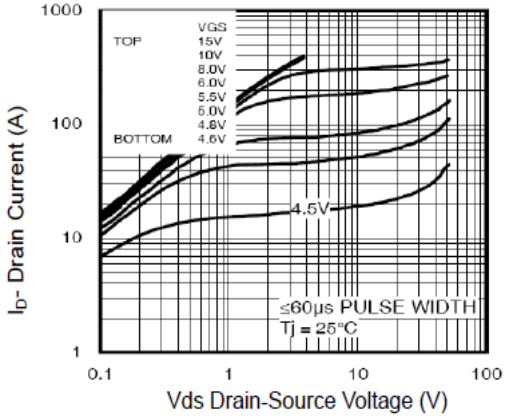


Figure3. Output Characteristics

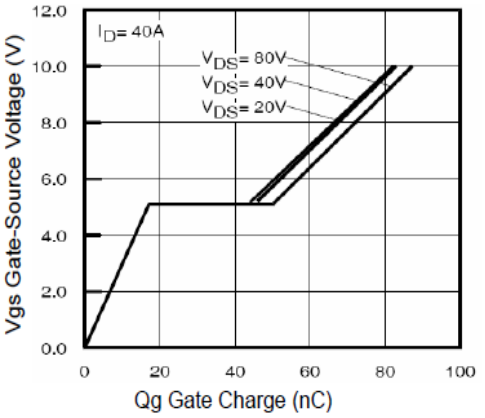


Figure4. Gate Charge

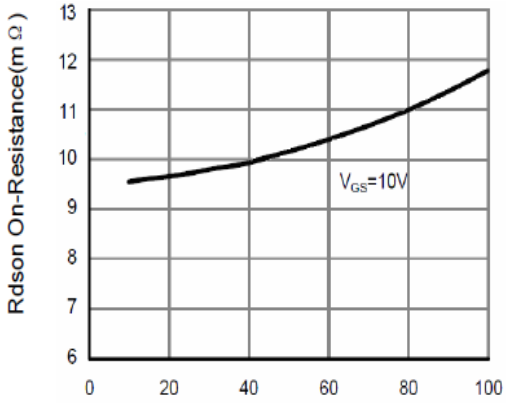


Figure5. R_{DSON}-Drain Current

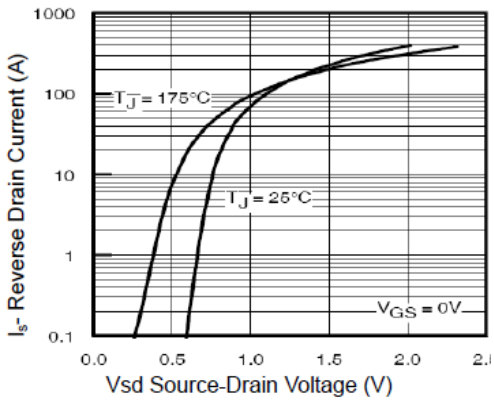


Figure6. Source-Drain Diode Forward

Typical electrical and thermal characteristics

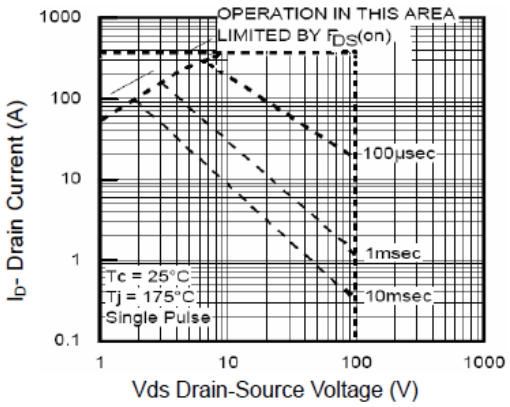


Figure7. Safe Operation Area

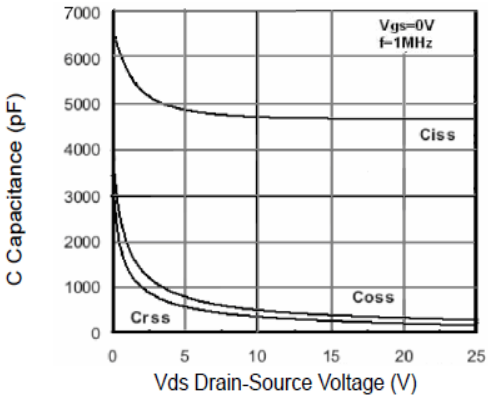


Figure8. V_{DS} vs. Capacitance

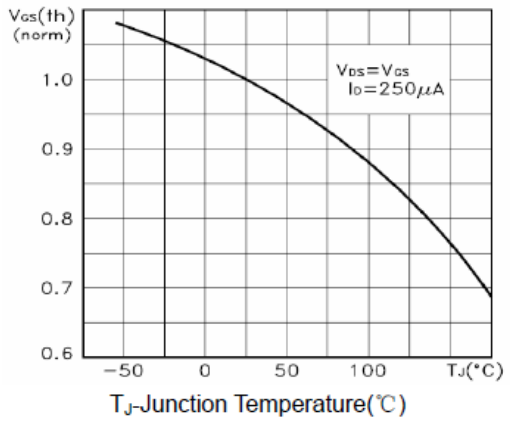


Figure9. $V_{GS(th)}$ vs. Junction Temperature

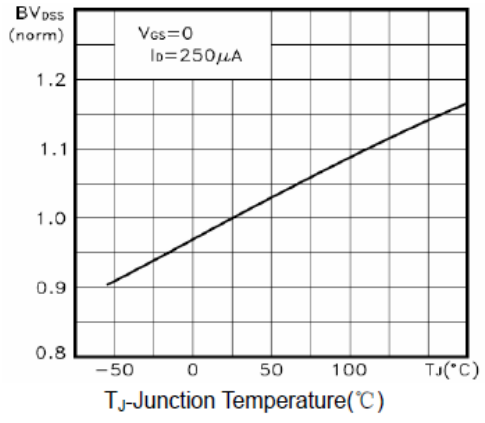


Figure10. BV_{DSS} vs. Junction Temperature

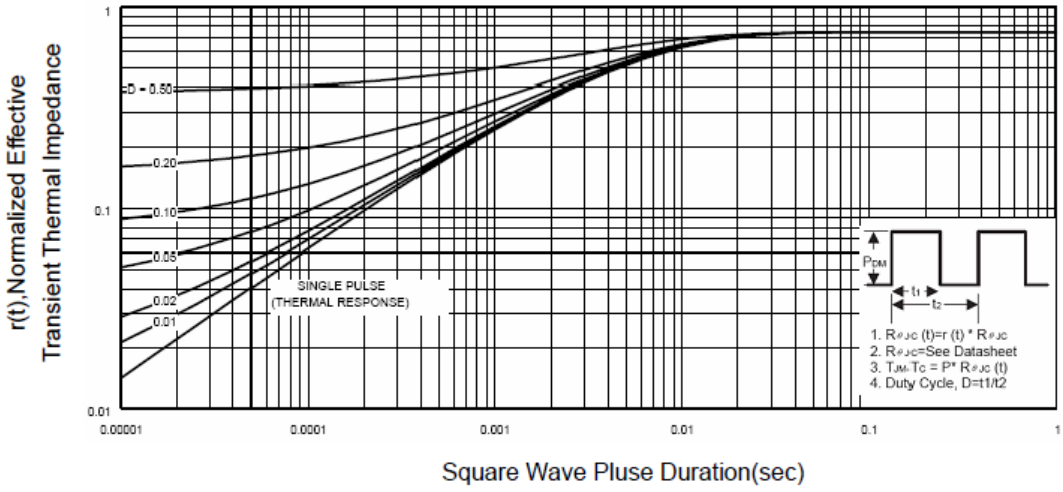
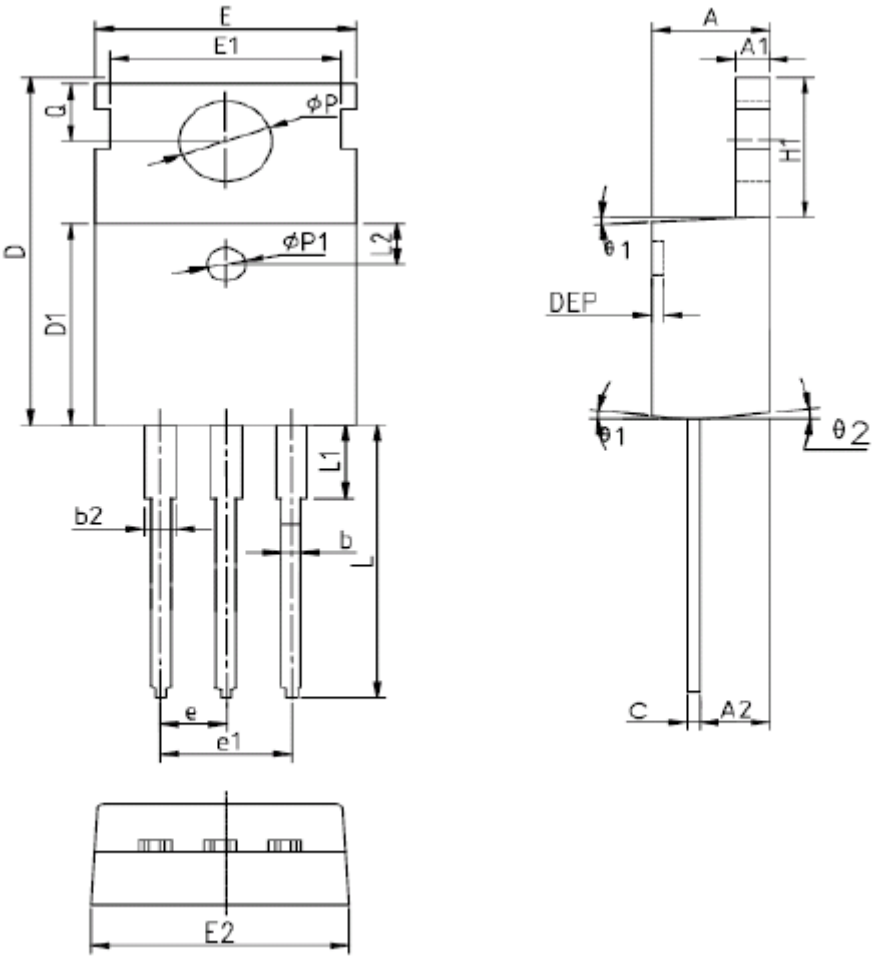


Figure11. Normalized Maximum Transient Thermal Impedance

TO220-3 Package Outline



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	Øp1	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	Øp	3.57	3.60	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							