

N Channel Enhancement Mode Power MOSFET

GENERAL DESCRIPTION

The JY14M 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.

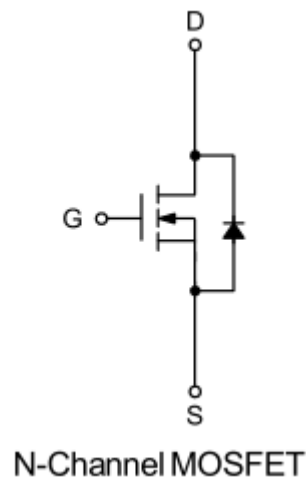
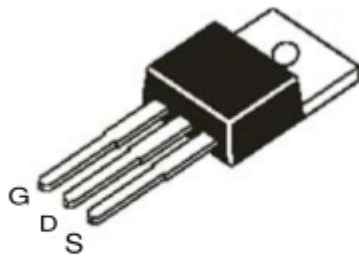
FEATURES

- 40V/200A, $R_{DS(ON)}=2.5m\Omega@V_{GS}=10V$
- 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



JY14M

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

Symbol	Parameter	Limit	Unit	
V _{DS}	Drain-Source Voltage	40	V	
V _{GS}	Gate-Source Voltage	± 20	V	
I _D	Continuous Drain Current	Tc=25° C	200	A
		Tc=100° C	130	
I _{DM}	Pulsed Drain Current	720	A	
P _D	Maximum Power Dissipation	210	W	
T _J T _{STG}	Operating Junction and Storage Temperature Range	-55 to +175	° C	
R _{θJC}	Thermal Resistance-Junction to Case	0.65	° C/W	
R _{θJA}	Thermal Resistance-Junction to Ambient	62		

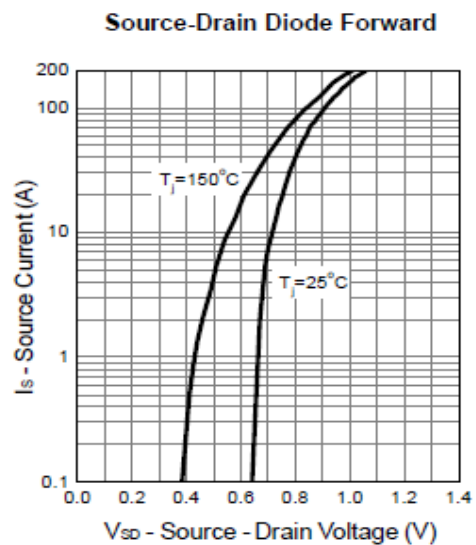
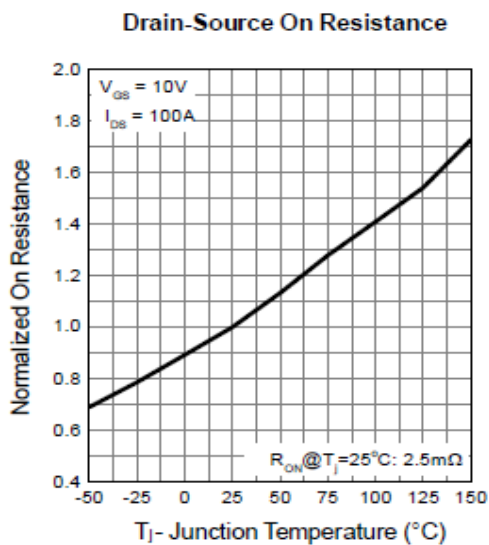
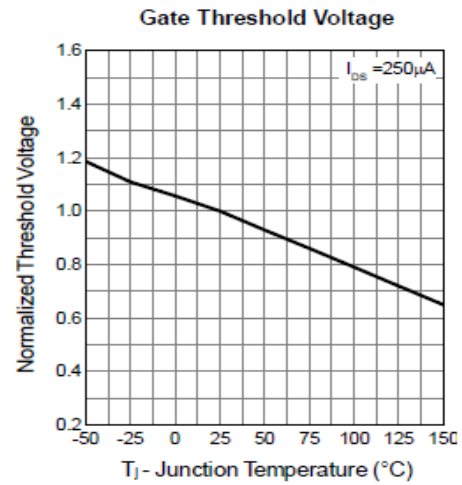
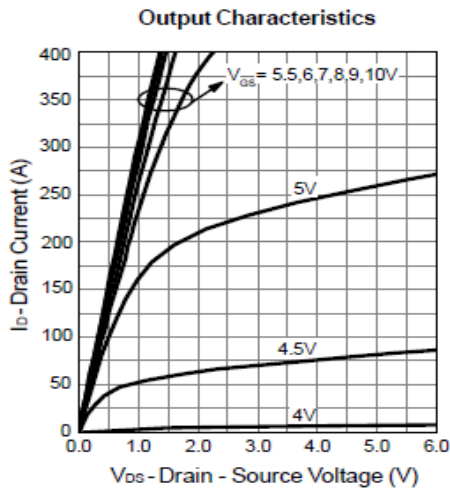
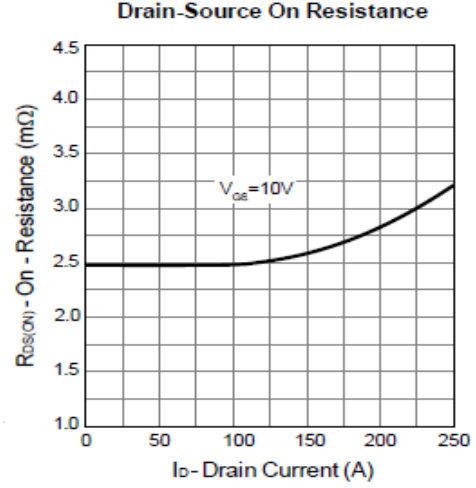
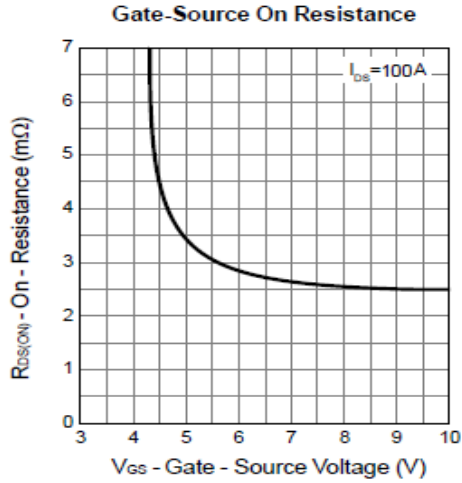
Electrical Characteristics(Ta=25° C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	40			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} =60A		2.5		mΩ
g _{FS}	Forward Transconductance	V _{DS} =20V, I _{DS} =60A	100			S

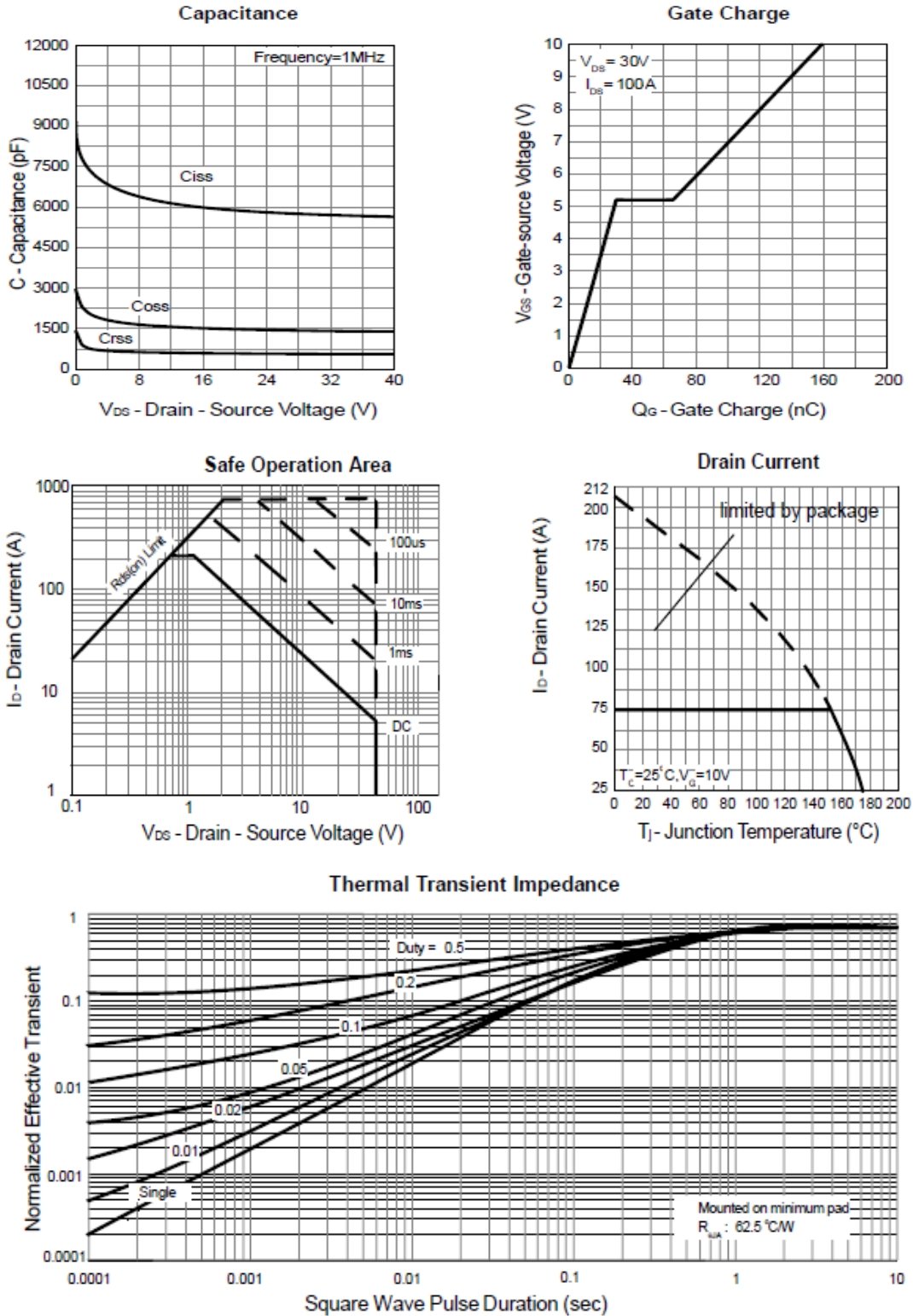
Electrical Characteristics(Ta=25°C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =100A			1.2	V
T _{rr}	Reverse Recovery Time	I _{SD} =100A		38		ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/us		58		nC
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHZ		1.2		Ω
T _{d(on)}	Turn-on Delay Time	V _{DS} =20V, R _G =6Ω, I _{DS} =100A, V _{GS} =10V,		34		ns
Tr	Turn-on Rise Time			22		
T _{d(off)}	Turn-off Delay Time			48		
T _f	Turn-off Fall Time			60		
C _{ISS}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, f=1.0MHz		5714		pF
C _{OSS}	Output Capacitance			1460		
C _{RSS}	Reverse Transfer Capacitance			600		
Q _g	Total Gate Charge	V _{DS} =30V, I _D =100A, V _{GS} =10V		160		nC
Q _{gs}	Gate-Source Charge			32		
Q _{gd}	Gate-Drain Charge			58		

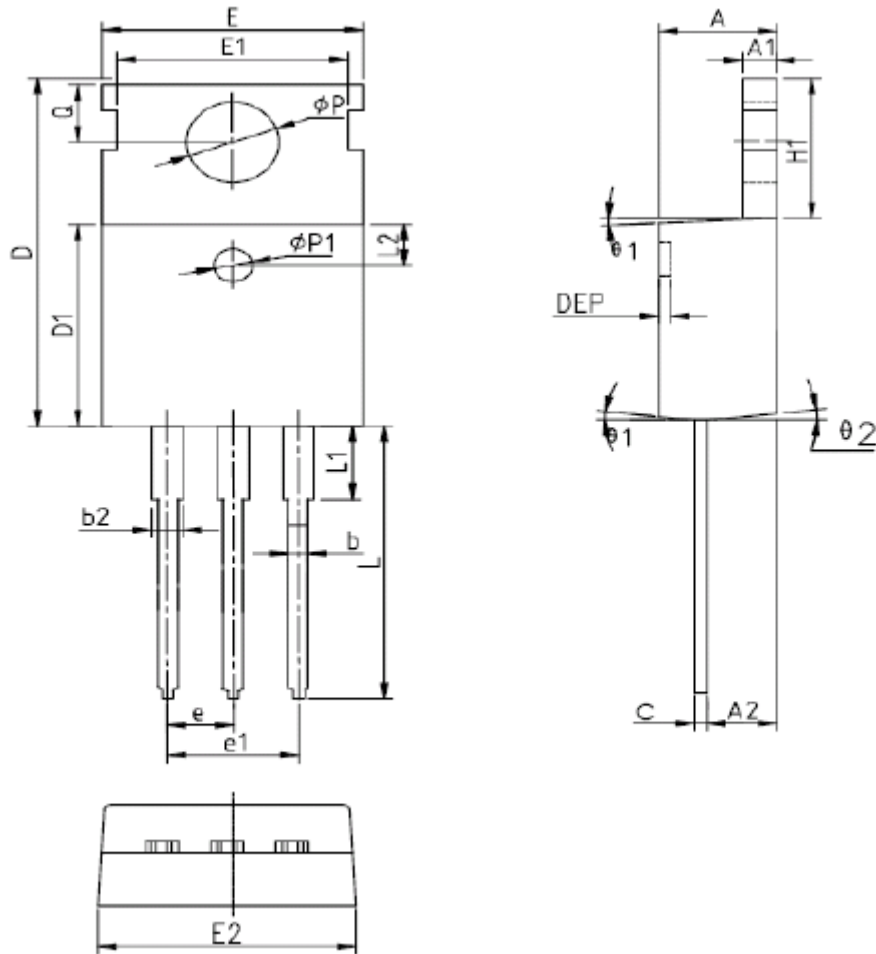
Typical electrical and thermal characteristics



Typical electrical and thermal characteristics



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	$\phi p1$	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	3.60	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	$\theta 1$	5°	7°	9°	5°	7°	9°
E1	-	8.70	-	-	0.343	-	$\theta 2$	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.401							