Description

JMP N-channel MOSFET

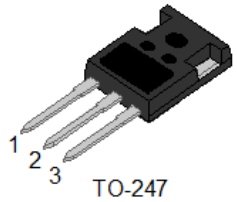
Features

- 600V,20A
- $R_{DS(ON)}$ = 0.3Ω (Typ.) @ V_{GS} = 10V, I_D =10A
- Fast Switching
- Improved dv/dt Capability
- 100% Avalanche Tested

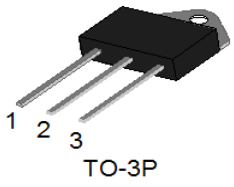
Application

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)

Package



JMPS20N60A



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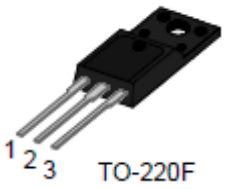
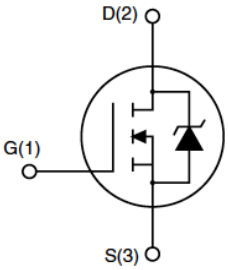


JMPF20N60A



Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter		Max.		Units
			TO-3P/TO-247	TO-220F	
V_{DSS}	Drain-Source Voltage		600		V
V_{GSS}	Gate-Source Voltage		±30		V
I_D	Continuous Drain Current	T_C = 25℃	20		A
		T_C = 100℃	13		A
I_{DM}	Pulsed Drain Current note1		80		A
E_{AS}	Single Pulsed Avalanche Energy note2		1350		mJ
P_D	Power Dissipation	T_C = 25℃	416	167	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		0.3	0.75	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		60	90	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150		℃

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250μA	600	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 600V, V_{GS} = 0V, T_J= 25℃	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V, V_{GS} = ±30V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	2	3	4	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS} =10V, I_D =10A	-	0.3	0.45	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	2980	-	pF
C_{oss}	Output Capacitance		-	291	-	pF
C_{rss}	Reverse Transfer Capacitance		-	40	-	pF
Q_g	Total Gate Charge	V_{DD} = 480V, I_D = 20A, V_{GS} = 10V	-	80	-	nC
Q_{gs}	Gate-Source Charge		-	12	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	34	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 250V, I_D =20A, R_G = 25Ω	-	37	-	ns
t_r	Turn-on Rise Time		-	66	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	175	-	ns
t_f	Turn-off Fall Time		-	84	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	20	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	80	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_{SD} = 20A	-	-	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS} =0V, I_S=20A, di/dt=100A/μs	-	450	-	ns
Q_{rr}	Reverse Recovery Charge		-	7.1	-	μC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. I_{AS} =16A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤1%

Typical Performance Characteristics

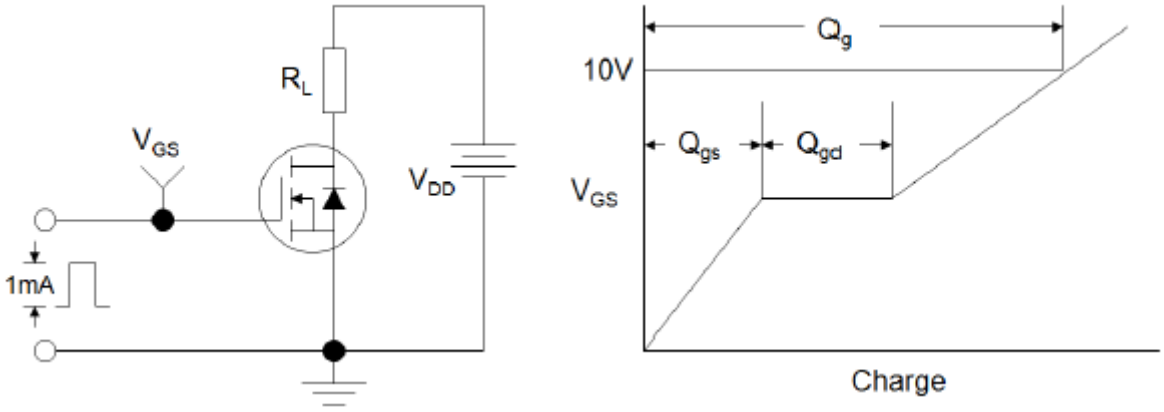


Figure1:Gate Charge Test Circuit & Waveform

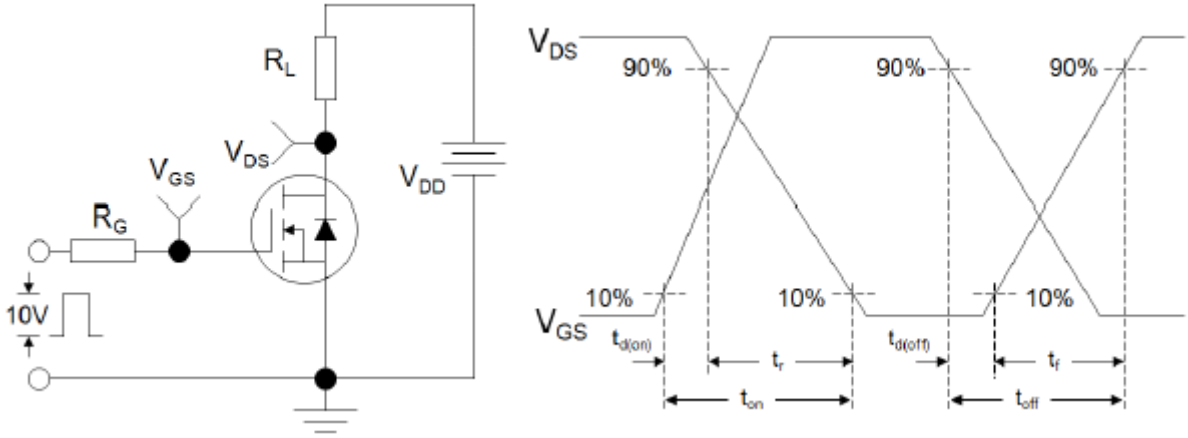


Figure 2: Resistive Switching Test Circuit & Waveforms

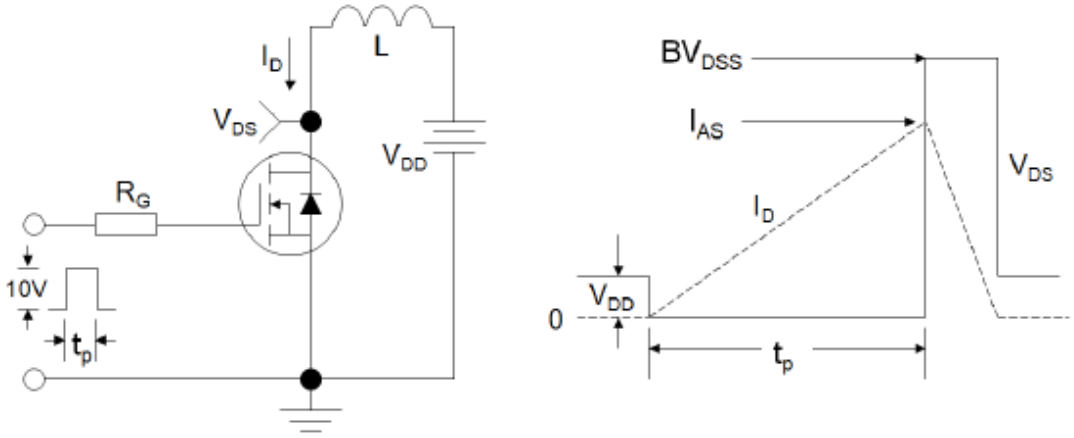


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

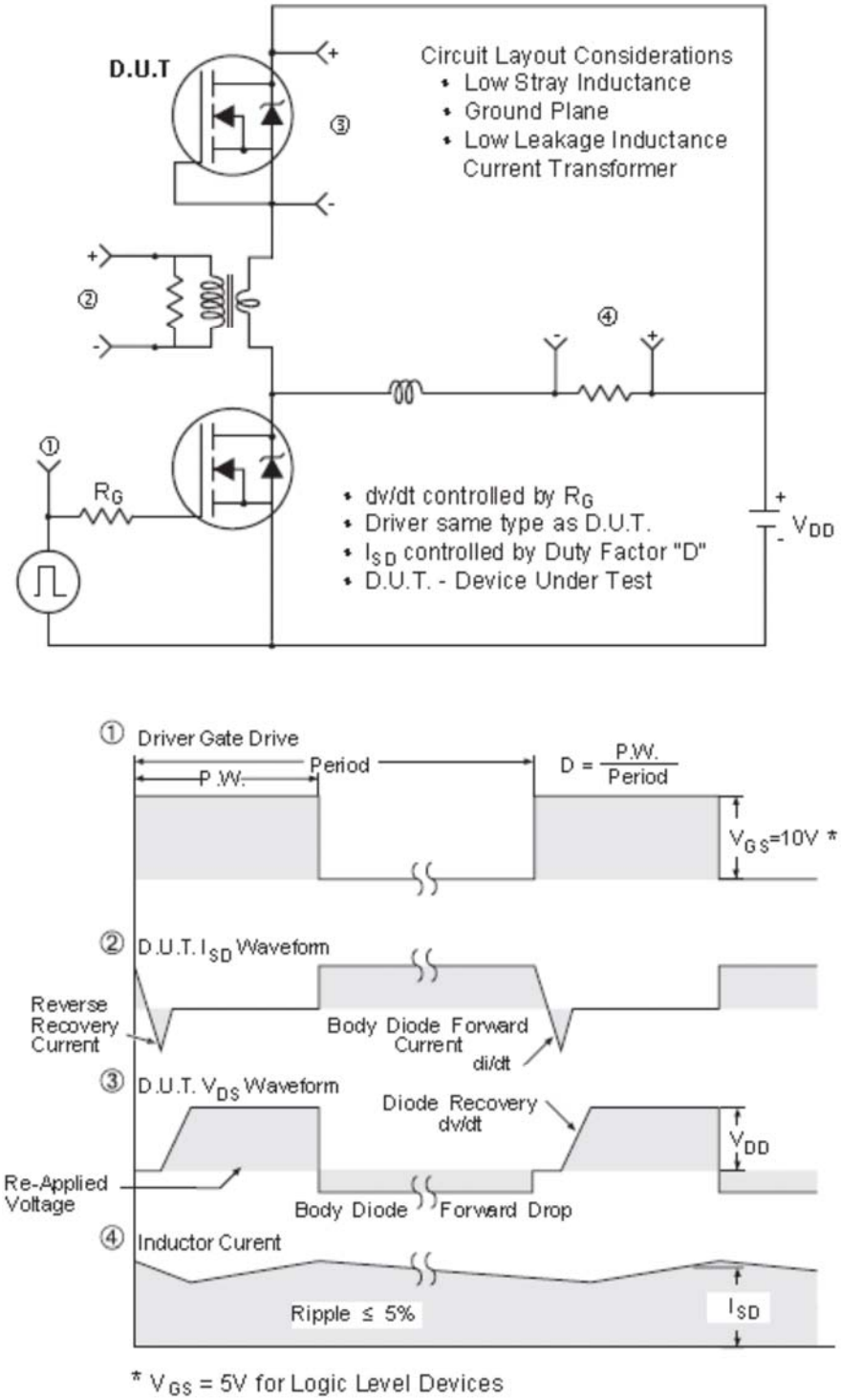
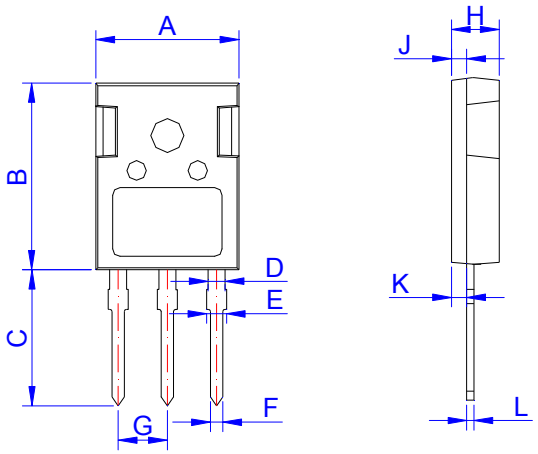


Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

Package Mechanical Data



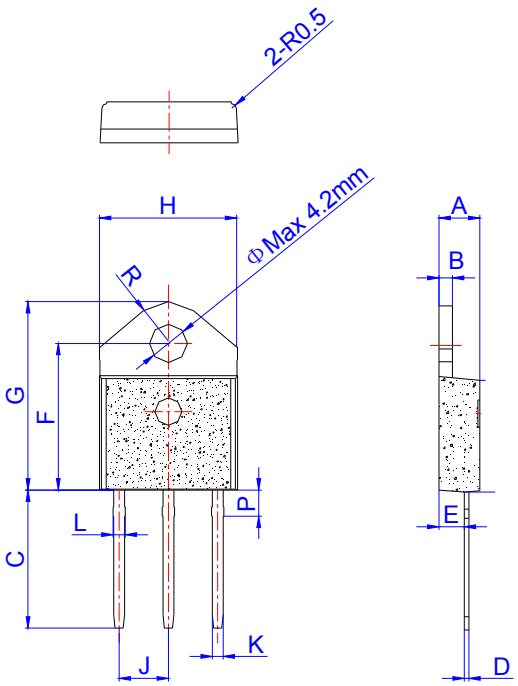
TO-247

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.50	15.80	16.10	0.610	0.622	0.634
B	20.80	21.00	22.20	0.819	0.828	0.874
C	19.70	20.00	20.30	0.776	0.787	0.799
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.90	2.10	2.30	0.075	0.083	0.091
F	1.00	1.20	1.40	0.039	0.047	0.055
G		5.44			0.214	
H	4.80	5.00	5.20	0.189	0.197	0.205
J	1.90	2.00	2.10	0.075	0.079	0.083
K	2.20	2.35	2.50	0.087	0.093	0.098
L	0.41	0.60	0.79	0.016	0.024	0.031

Package Information-TO-247

OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON (PCS)
TUBE	30	450	3,600

Package Mechanical Data



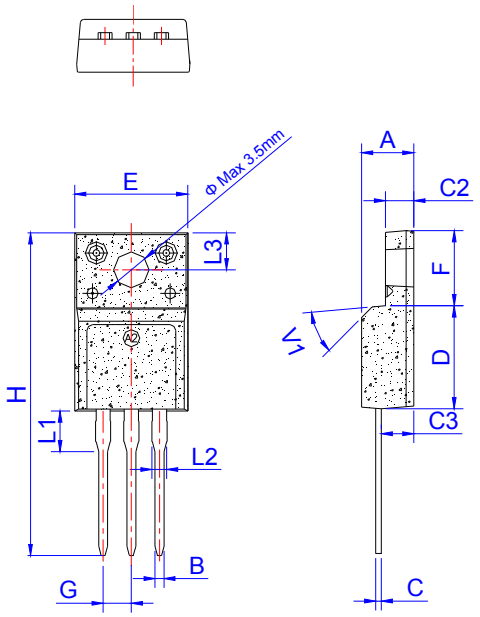
TO-3P

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	1.45		1.55	0.057		0.061
C	14.35		15.60	0.565		0.614
D	0.50		0.70	0.020		0.028
E	2.70		2.90	0.106		0.114
F	15.80		16.50	0.622		0.650
G	20.40		21.10	0.803		0.831
H	15.10		15.50	0.594		0.610
J	5.40		5.65	0.213		0.222
K	1.10		1.40	0.043		0.055
L	1.35		1.50	0.053		0.059
P	2.80		3.00	0.110		0.118
R		4.35			0.171	

Package Information- TO-3P

OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON (PCS)
TUBE	30	450	3,600

Package Mechanical Data



TO-220F

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.50		4.90	0.177		0.193
B	0.74	0.80	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.60		3.00	0.102		0.118
D	8.80		9.30	0.346		0.366
E	9.80		10.4	0.386		0.410
F	6.40		6.80	0.252		0.268
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.63			0.143	
L2	1.14		1.70	0.045		0.067
L3		3.30			0.130	
V1		45°			45°	

Package Information -TO-220F

OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON (PCS)
TUBE	50	1,000	8,000

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