120V N-Channel Mosfet

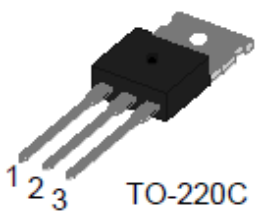
FEATURES

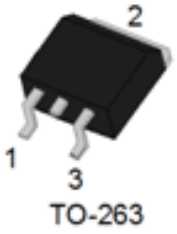
- $R_{DS(ON)}$=5.0mΩ(Typ.) @V_{GS}=10V, I_D=30A

APPLICATIONS

- Motor Control and Drive
- Uninterruptible Power Supply (UPS)
- Battery Management

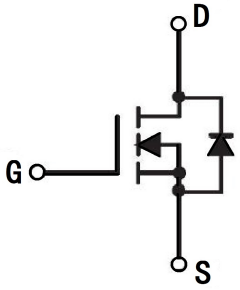
TO-220C/TO-263





JST110N120TC **JST110N120T3**

N-CHANNEL MOSFET



MAXIMUM RATINGS (TC=25°C unless otherwise noted)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		120	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	110	A
		T_C = 100℃	70	A
I_{DM}	Pulsed Drain Current note1		330	A
E_{AS}	Single Pulsed Avalanche Energy note2		400	mJ
P_D	Power Dissipation	T_C = 25℃	192	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		0.65	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		62	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

MOSFET ELECTRICAL CHARACTERISTICS Ta=25 °C unless otherwise specified

Symbol	Param	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V,I_D = 250μA	120	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 120V, V_{GS} = 0V, T_J = 25℃	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS},I_D = 250μA	2	-	4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance note3	V_{GS} =10V, I_D =30A	-	5.0	6.5	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =50V, V_{GS} = 0V, f = 1.0MHz	-	5823	-	pF
C_{oss}	Output Capacitance		-	778.8	-	pF
C_{rss}	Reverse Transfer Capacitance			17.5	-	pF
Q_g	Total Gate Charge	V_{DS}=50V, I_D=25A, V_{GS}=10V, f=1.0MHz	-	68.9	-	nC
Q_{gs}	Gate-Source Charge		-	18.1	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	15.9	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{GS} = 10V, V_{DS}=50V, R_G =2Ω, I_D=25A	-	30.3	-	ns
t_r	Turn-On Rise Time		-	33	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	59.5	-	ns
t_f	Turn-Off Fall Time		-	11.7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	110	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	330	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_{SD}=30A, T_J = 25℃	-	-	1.3	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V, I_S =25A, di/dt =100A/μs	-	8	-	ns
Q_{rr}	Reverse Recovery Charge		-	240	-	nC

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. V_{DD}=50 V, R_G=50Ω, L=0.3 mH, starting T_j=25℃.

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

TYPICAL PERFORMANCE CHARACTERISTICS

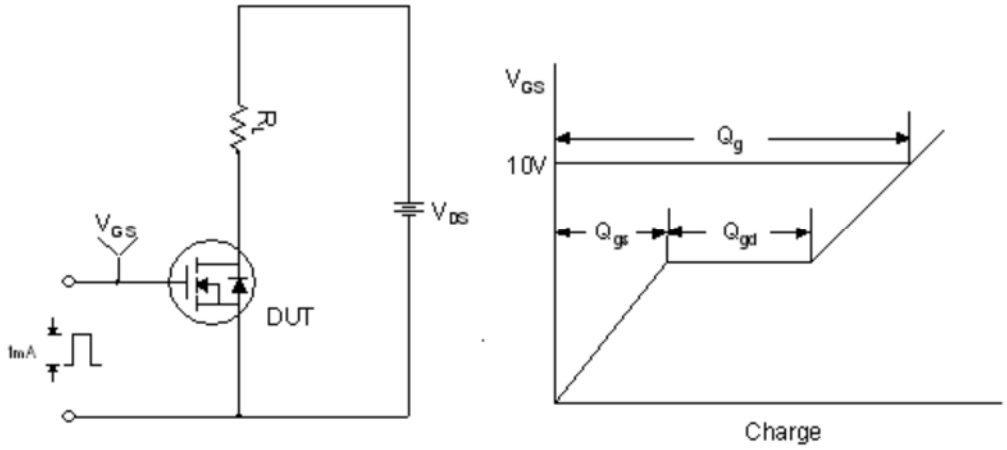


Figure 1. Gate Charge Test Circuit & Waveform

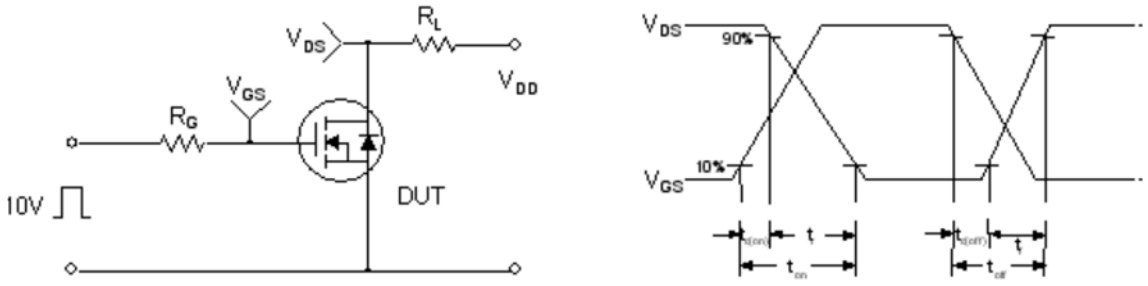


Figure 2. Resistive Switching Test Circuit & Waveforms

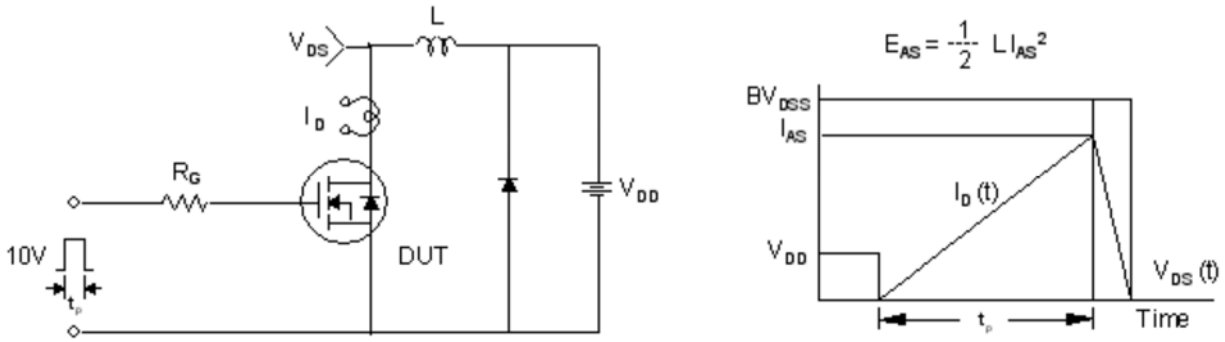


Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms

TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

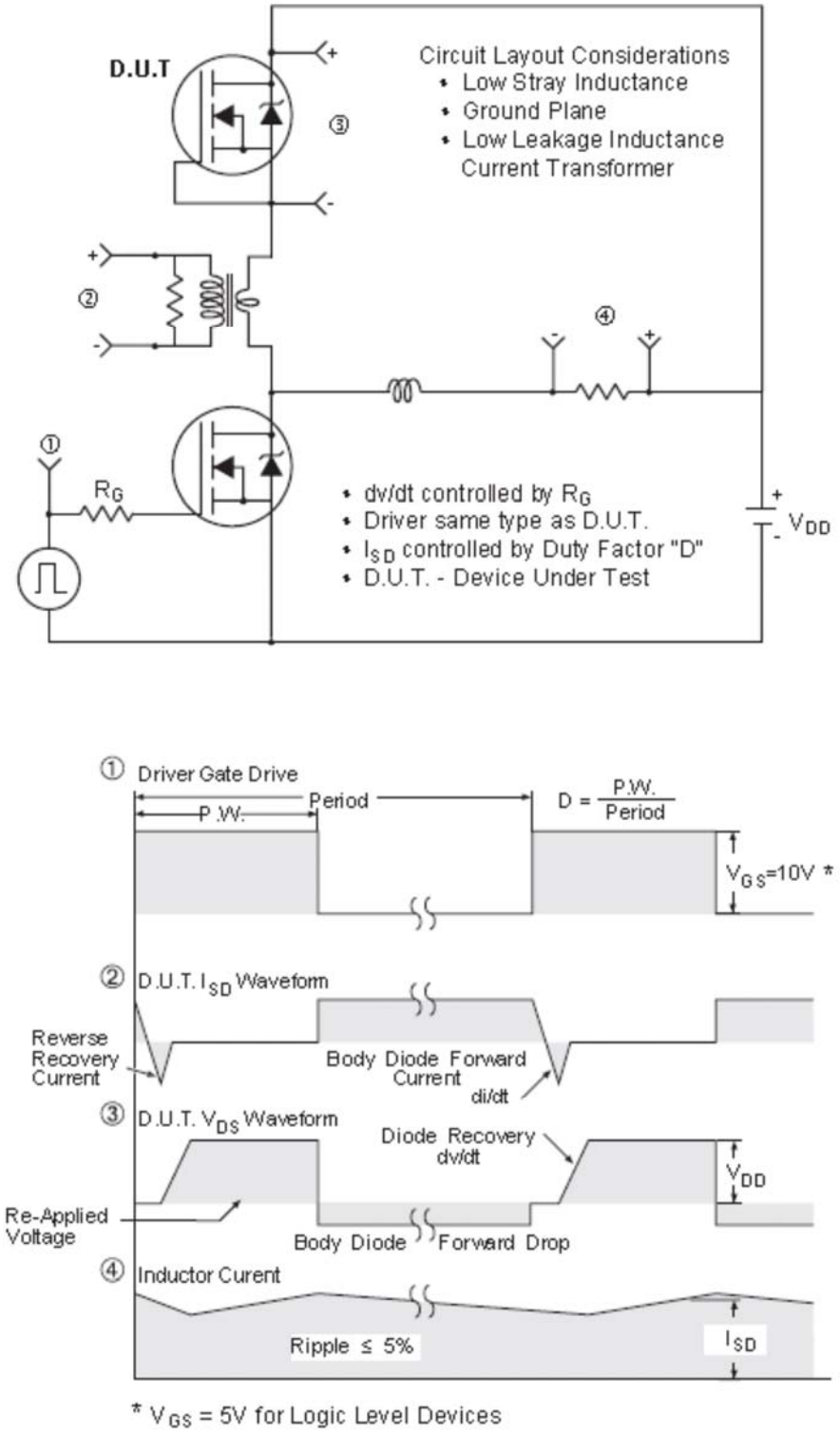
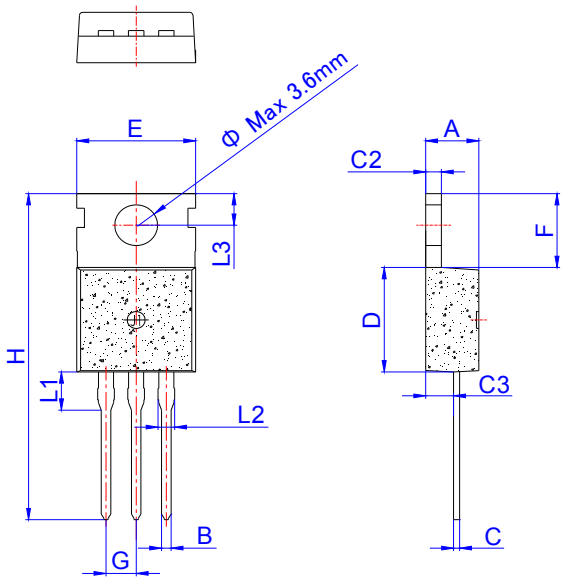


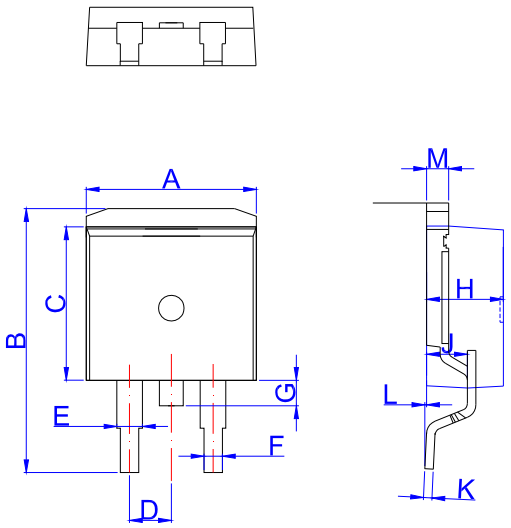
Figure 4. Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

TO-220C PACKAGE OUTLINE DRAWING



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		1.181
B	0.70		0.90	0.027		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.086		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	11.0		11.7
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	

TO-263 PACKAGE OUTLINE DRAWING



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90		10.20	0.390		0.402
B	14.70		15.80	0.579		0.622
C	9.4		9.6	0.37		0.378
D		2.54			0.100	
E	1.20		1.40	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40		4.70	0.173		0.185
J	2.30		2.70	0.091		0.106
K	0.38		0.55	0.015		0.022
L	0	0.10	0.25	0	0.004	0.010
M	1.25		1.35	0.049		0.053