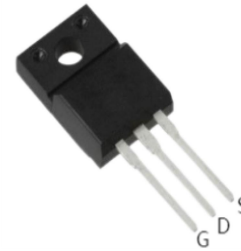




1.Features

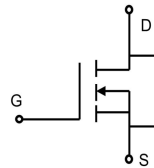
- V_{DS} 500V
- I_D 13A
- $R_{DS(on)}$ (at $V_{GS}=10V$ $I_D=6.5A$) 0.45 Ω (Typ)
0.5 Ω (Max)

ITO-220



2.Mechanical Data

- Case:Molded Plastic, ITO-220;
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Marking: marked on body.
- Mounting Position : Any.



1. Gate
2. Drain
3. Source

3.Maximum Ratings and Electrical Characteristics

Electrical Characteristics ($T_J=25^{\circ}C$ unless otherwise noted)

Characteristics		Symbol	Ratings		Unit
Drain-Source Voltage		V _{DS}	500		V
Gate-Source Voltage		V _{GS}	±30		V
Drain Current-Continuous	T _C =25°C	I _D	13		A
	T _C =100°C		7.9		
Power Dissipation(T _C =25°C)		P _D	50		W
Single Pulsed Avalanche Energy (Note1)		E _{AS}	500		mJ
Avalanche Current (note2)		I _{AR}	13		A
Junction Temperature(Max)		T _J	150		°C
Junction and Storage Temperature Range		T _{stg}	-55 to +150		°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		TL	300		°C
Thermal Characteristics					
Parameter		Symbol	Typ	Max	Unit
Thermal Resistance, Junction-to-Case		R _{θJC}	-	2.5	°C/W
Thermal Resistance, Junction-to-Ambient		R _{θJA}	-	62.5	°C/W



Characteristics	Symbol	Test conditions	Min	TYP	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V,I _D =250μA	500	-	-	V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	I _D =250μA,Reference to 25°C	-	0.65	-	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 500V,V _{GS} = 0V	-	-	1	μA
		V _{DS} = 400V,T _J =125°C	-	-	100	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = 30V,V _{DS} = 0V	-	-	100	nA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = -30V,V _{DS} = 0V	-	-	-100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	2	-	4	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =6.5A	-	0.45	0.5	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{iss}	V _{DS} =25V V _{GS} =0V f=1.0MHZ	-	1680	-	pF
Output Capacitance	C _{oss}		-	120	-	
Reverse Transfer Capacitance	C _{rss}		-	12	-	
SWITCHING PARAMETERS						
Turn-on Delay Time	t _{d(on)}	V _{DD} =250V, V _{GS} =13V R _G =25Ω; (Note 3.4)	-	40	-	ns
Turn-on Rise Time	t _r		-	140	-	
Turn-off Delay Time	t _{d(off)}		-	125	-	
Turn-off Fall Time	t _f		-	85	-	
Total Gate Charge	Q _g	V _{DS} =400V, I _D =13A V _{GS} =10V (Note 3.4)	-	50	-	nC
Gate-Source Charge	Q _{gs}		-	9.8	-	
Gate-Drain Charge	Q _{gd}		-	18.5	-	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Source Current	I _S	-	-	-	13	A
Pulsed Source Current	I _{SM}		-	-	52	
Diode Forward Voltage	V _{SD}	I _D =13A,	-	-	1.4	V
Reverse Recovery Time	T _{rr}	I _S =13A,V _{GS} =0V, dIF/dt=100A/μS(Note3)	-	420	-	ns
Reverse Recovery Charge	Q _{rr}		-	4.2	-	nC

4.Ordering Information

Part No.	Package	Marking
DMF9N90	ITO-220	DMF9N90

Notes:

- 1.L=17.1mH, $I_{AS}=13A$, $V_{DD}=50V$, $R_G=25\Omega$, starting $T_J=25^\circ C$
- 2.Pluse width limited by maximum junction temperature
- 3.Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
- 4.Essentially independent of operating temperature



5. Rating And Characteristic Curves

Fig.1 Typical Output Characteristics, $T_c=25^\circ\text{C}$

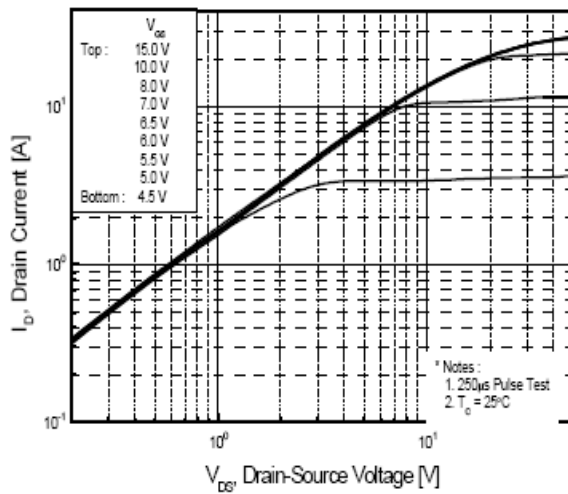


Fig.2 On-Resistance Vs. Drain Current and Gate Voltage

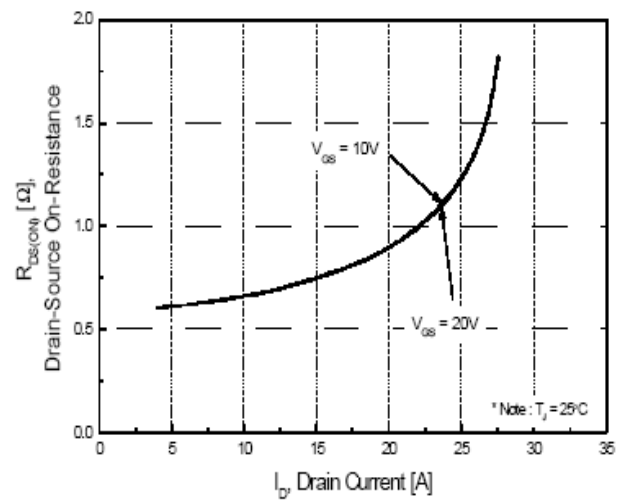


Fig.3 Normalized On-Resistance Vs. Temperature

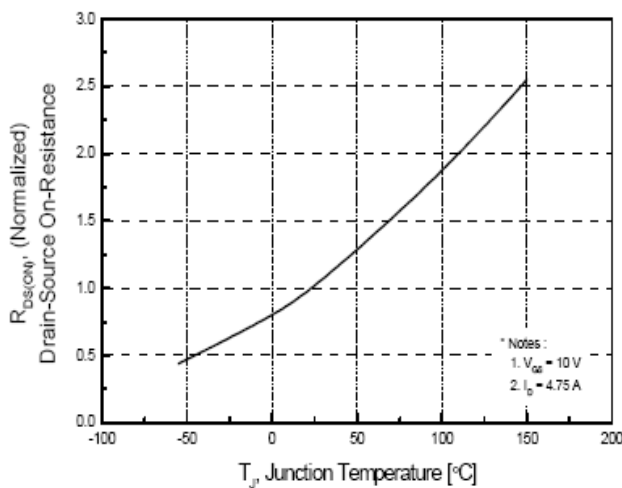


Fig.4 Typical Source-Drain Diode Forward Voltage

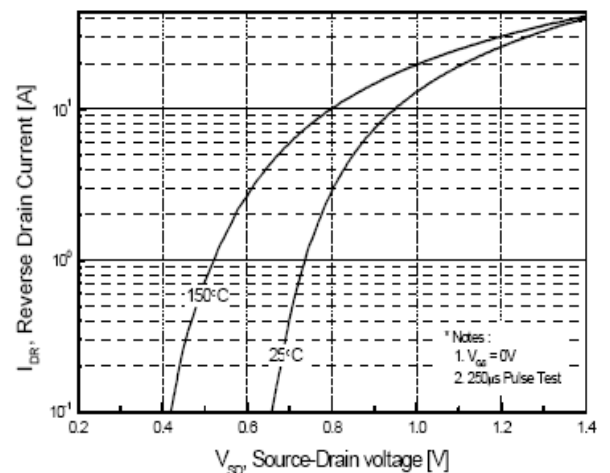


Fig.5 Maximum Drain Current Vs. Case Temperature

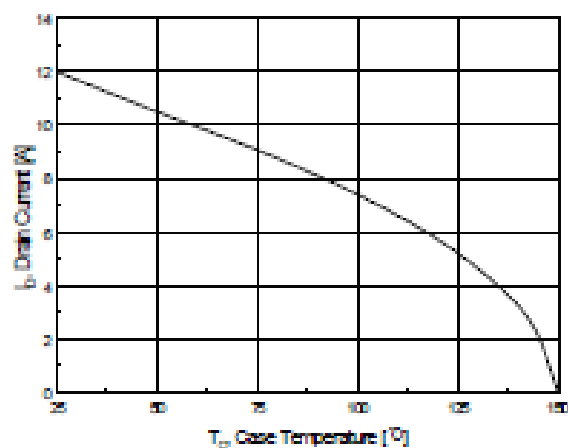
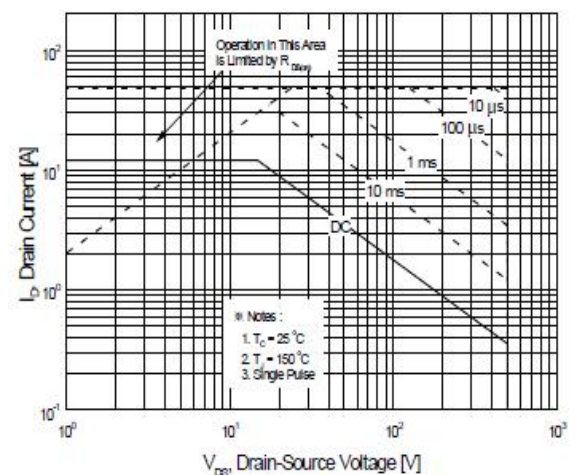
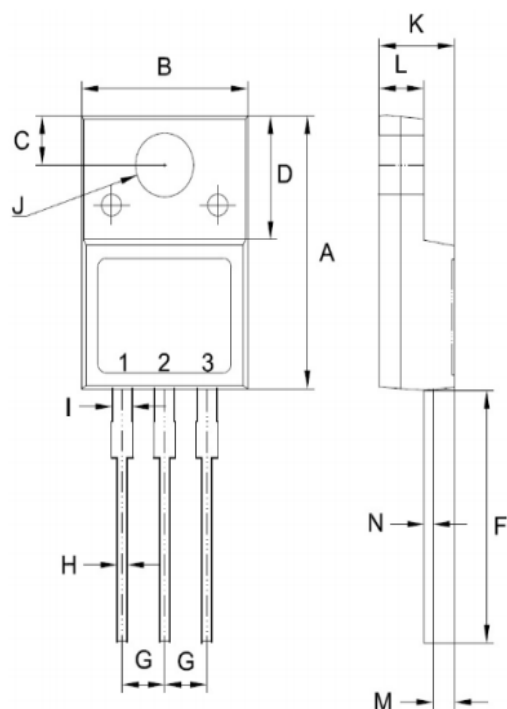


Fig.6 Maximum Safe Operating Area





6. Dimensions

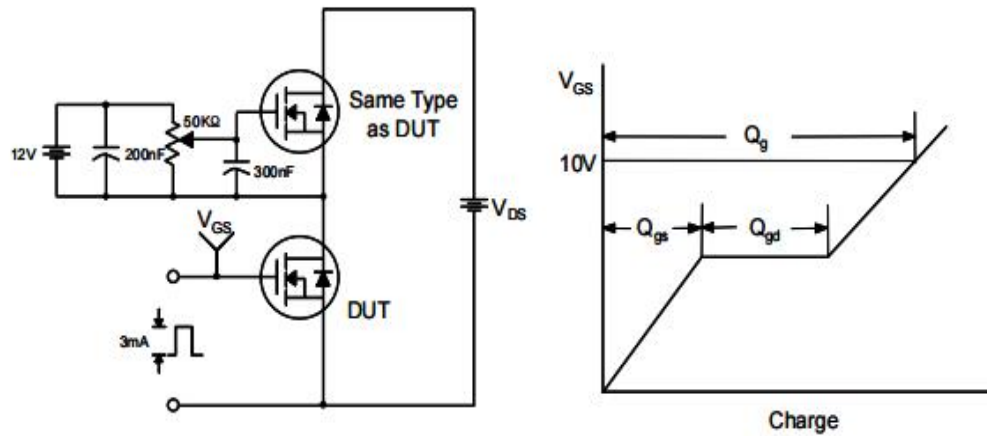


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.571	0.642	14.50	16.30
B	0.374	0.413	9.50	10.50
C	0.098	0.140	2.50	3.55
D	0.248	0.287	6.30	7.30
F	0.503	0.551	12.78	14.00
G	0.093	0.108	2.35	2.75
H	0.012	0.037	0.30	0.95
I	0.035	0.059	0.90	1.50
J	0.118	0.150	3.00	3.80
K	0.167	0.198	4.24	5.02
L	0.091	0.115	2.30	2.92
N	0.018	0.025	0.45	0.63

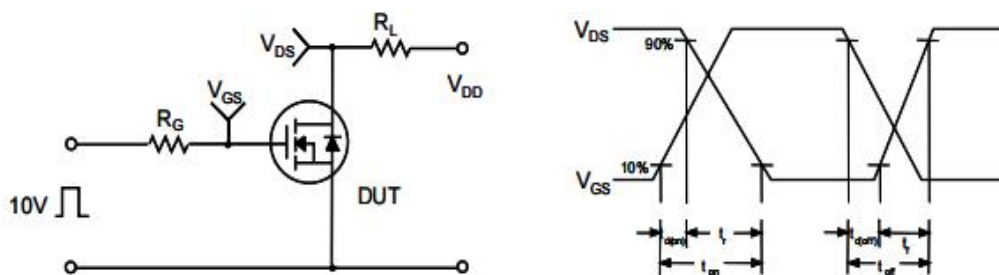


7. Test circuits

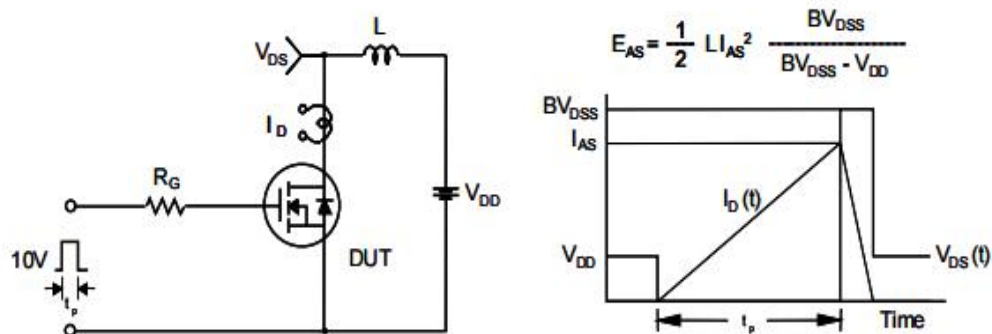
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

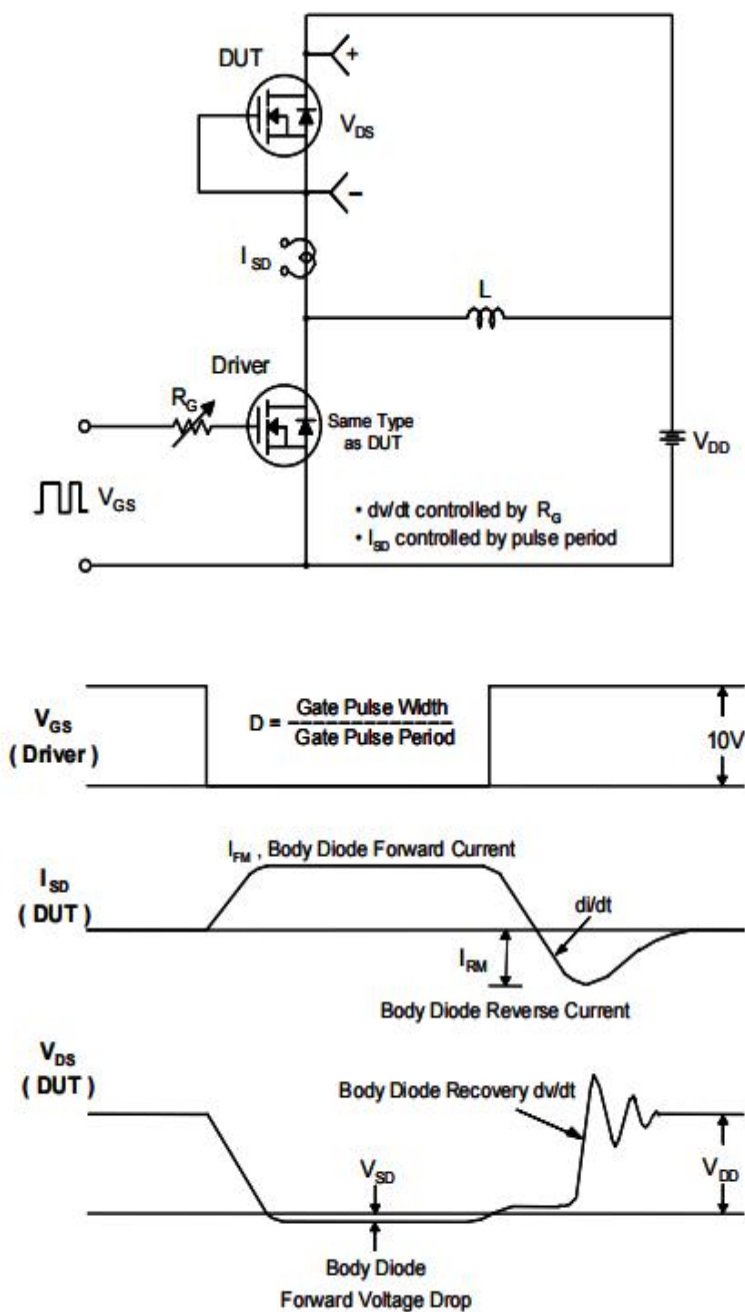


Unclamped Inductive Switching Test Circuit & Waveforms





Peak Diode Recovery dv/dt Test Circuit & Waveforms





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