TSM9NB50

500V N-Channel Power MOSFET

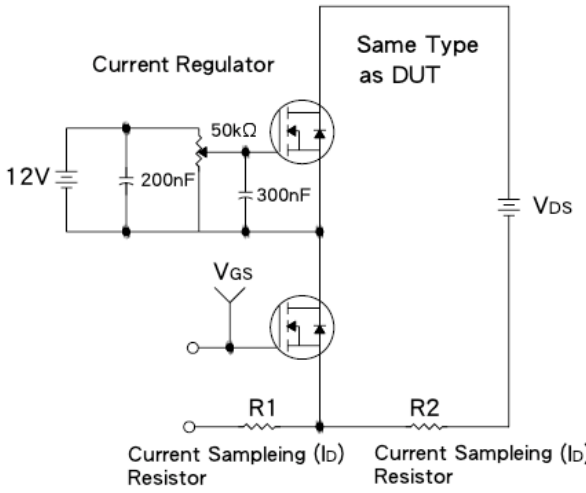
Electrical Specifications (Tc = 25°C unless otherwise noted)

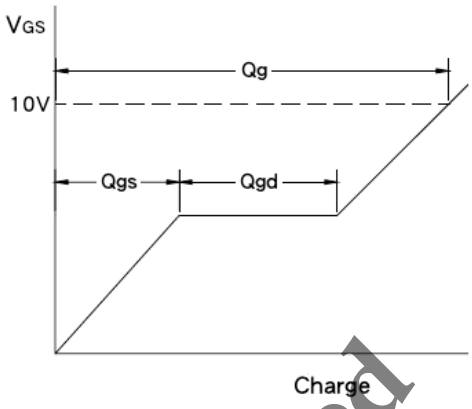
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	BV_{DSS}	500	--	--	V
Drain-Source On-State Resistance	V_{GS} = 10V, I_D = 4.5A	$R_{DS(ON)}$	--	0.72	0.85	Ω
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	$V_{GS(TH)}$	2.5	3.3	4.5	V
Zero Gate Voltage Drain Current	V_{DS} = 500V, V_{GS} = 0V	I_{DSS}	--	--	1	uA
Gate Body Leakage	V_{GS} = ±30V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Diode Forward Voltage	I_S = 9A, V_{GS} = 0V	V_{SD}	--	0.9	1.5	V
Dynamic						
Total Gate Charge	V_{DS} = 400V, I_D = 8A, V_{GS} = 10V	Q_g	--	44	--	nC
Gate-Source Charge		Q_{gs}	--	8	--	
Gate-Drain Charge		Q_{gd}	--	27.4	--	
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	1019	--	pF
Output Capacitance		C_{oss}	--	129	--	
Reverse Transfer Capacitance		C_{rss}	--	15	--	
Switching						
Turn-On Delay Time	V_{DD} = 250V, I_D = 9A, R_G = 25Ω	$t_{d(on)}$	--	27.4	--	nS
Turn-On Rise Time		t_r	--	46.8	--	
Turn-Off Delay Time		$t_{d(off)}$	--	13.3	--	
Turn-Off Fall Time		t_f	--	5.7	--	

Notes:

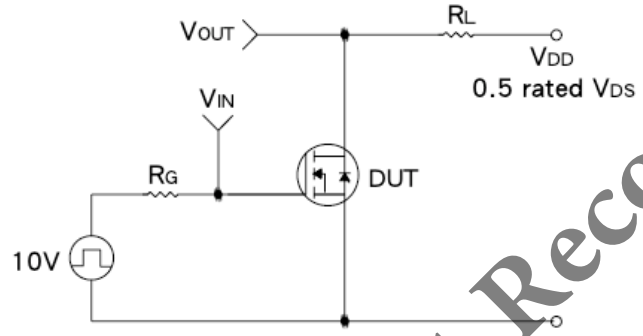
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. V_{DD} = 50V, I_{AS}=2.5A, L=60mH, V_{DS}=500V
3. Pulse test: pulse width ≤300uS, duty cycle ≤2%
4. Essentially Independent of Operating Temperature

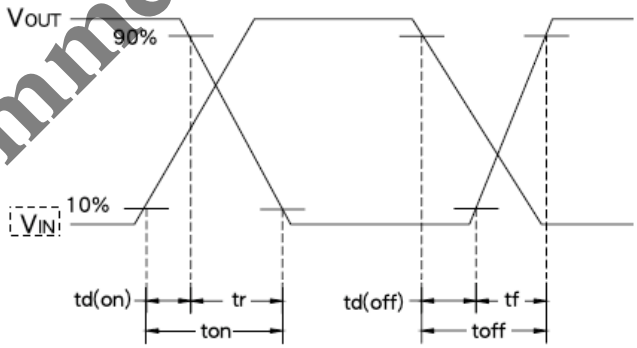
Gate Charge Test Circuit & Waveform



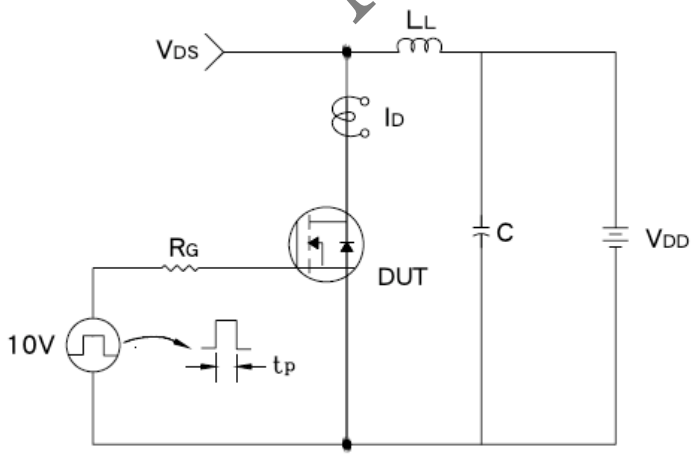


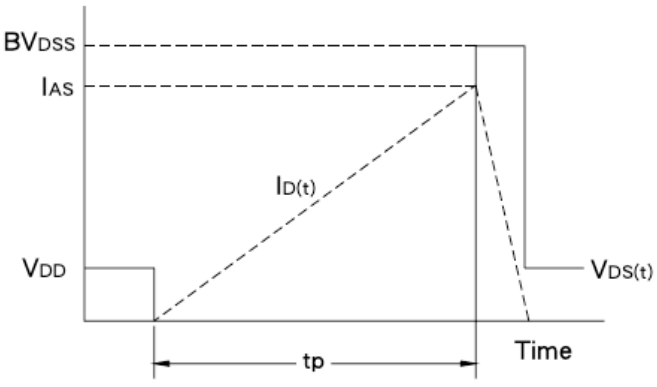
Resistive Switching Test Circuit & Waveform



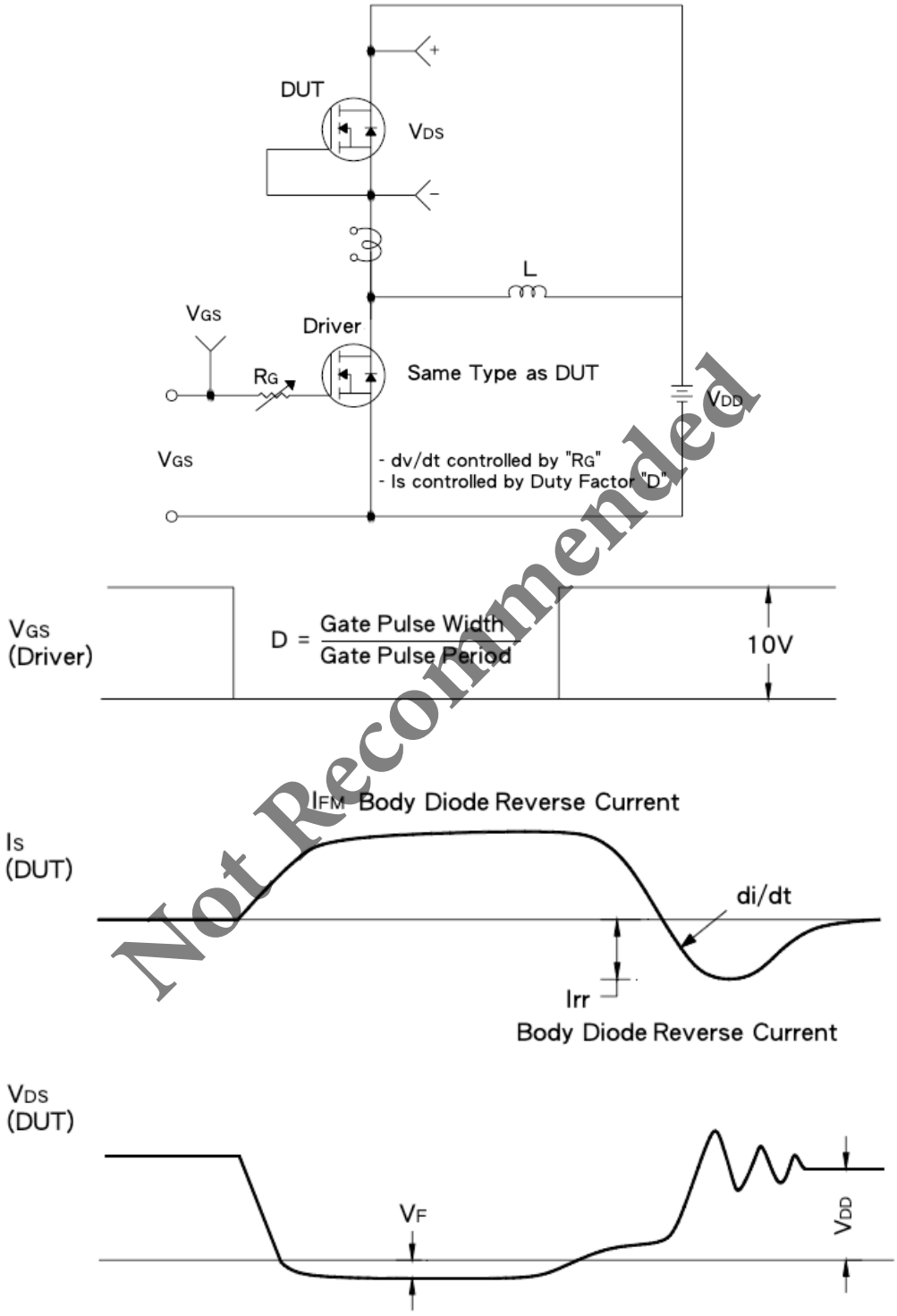


E_{AS} Test Circuit & Waveform





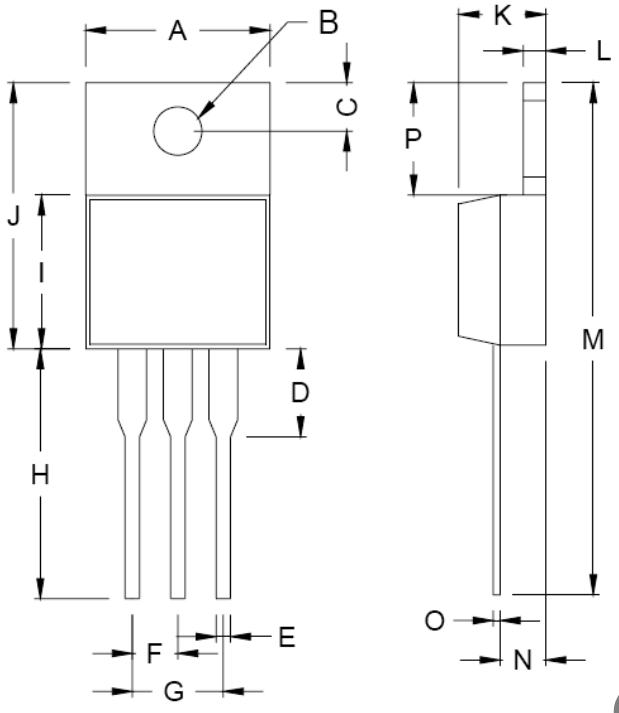
Diode Reverse Recovery Time Test Circuit & Waveform



TSM9NB50

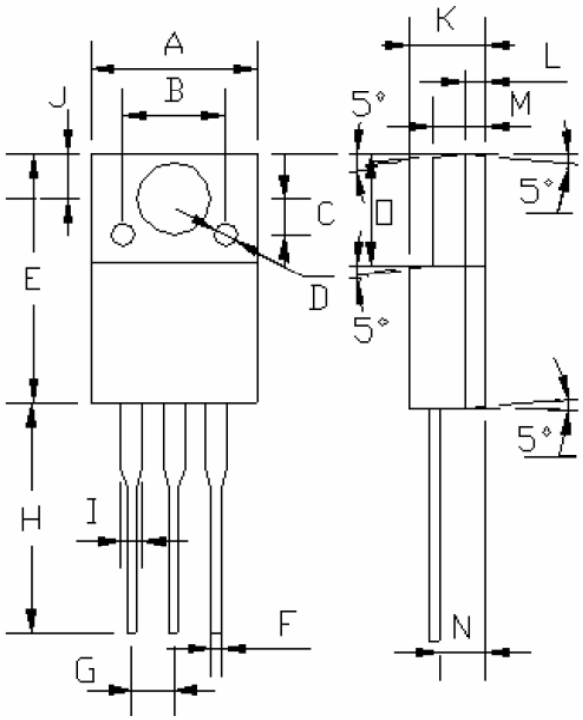
500V N-Channel Power MOSFET

TO-220 Mechanical Drawing



TO-220 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.00	10.50	0.394	0.413
B	3.74	3.91	0.147	0.154
C	2.44	2.94	0.096	0.116
D	--	6.35	--	0.250
E	0.38	1.10	0.015	0.043
F	2.34	2.71	0.092	0.107
G	4.69	5.43	0.185	0.214
H	12.70	14.73	0.500	0.580
I	8.38	9.38	0.330	0.369
J	14.22	16.51	0.560	0.650
K	3.55	4.82	0.140	0.190
L	1.16	1.40	0.046	0.055
M	27.70	29.62	1.091	1.166
N	2.03	2.92	0.080	0.115
O	0.25	0.61	0.010	0.024
P	5.84	6.85	0.230	0.270

ITO-220 Mechanical Drawing



ITO-220 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.04	10.07	0.395	0.396
B	6.20 (typ.)		0.244 (typ.)	
C	2.20 (typ.)		0.087 (typ.)	
D	ϕ 1.40 (typ.)		ϕ 0.055 (typ.)	
E	15.0	15.20	0.591	0.598
F	0.52	0.54	0.020	0.021
G	2.35	2.73	0.093	0.107
H	13.50	13.55	0.531	0.533
I	1.11	1.49	0.044	0.058
J	2.60	2.80	0.102	0.110
K	4.49	4.50	0.176	0.177
L	1.15 (typ.)		0.045 (typ.)	
M	3.03	3.05	0.119	0.120
N	2.60	2.80	0.102	0.110
O	6.55	6.65	0.258	0.262

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