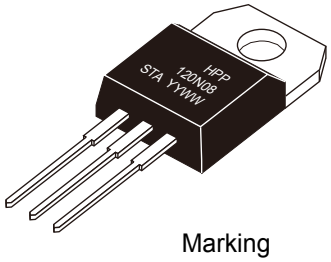
80V， 70A， N-CHANNEL POWER MOSFET

Product Summary

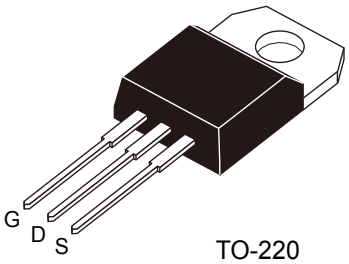
V_{DS}	80	V
$R_{DS(ON)}$ Max.	12	mΩ
I_D	70	A

Features

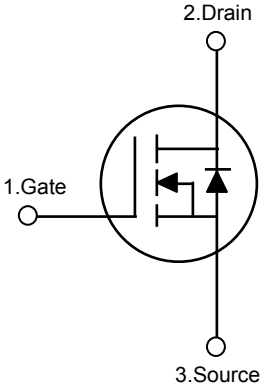
Advanced Process Technology
Ultra Low On-Resistance
Dynamic dv/dt Rating
175℃ Operating Temperature
Fast Switching
Repetitive Avalanche Allowed up to Tjmax
Lead-Free



Marking



TO-220



ORDERING INFORMATION

Order Number	Package	Pin Assignment			Packing
		1	2	3	
HPP120N08STA	TO-220	G	D	S	Tube

ABSOLUTE MAX IMUM RATINGS（T_C=25℃, unless otherwise specified）

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current	I_D	T_C=25℃	70	A
		T_C=100℃	65	
Pulsed Drain Current	I_D.pulse	T_C=25℃	350	
Avalanche energy, single pulse	E_{AS}	I_{AS}=53A, R_{GS}=25Ω	160	mJ
Single Pulse Avalanche Energy Tested Value	E_{AS} (tested)	I_{AS}=53A, R_{GS}=25Ω	200	
Gate source voltage	V_{GS}		±20	V
Maximum Power Dissipation	P_D	T_C=25℃	170	W
Linear Derating Factor	P_D	T_C=25℃	1.1	W/℃
Operating and storage temperature	T_J, T_{stg}		-55 to 175	℃

Thermal Resistance

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Junction-to-Case	R_{thJC}	TO-220	--	--	0.90	℃/W
Case-to-Sink, Flat, Greased Surface	$R_{\theta CS}$		--	0.50	--	
Junction-to-Ambient	$R_{\theta JA}$		--	--	62	
Junction-to-Ambient (PCB Mount, steady state)	$R_{\theta JA}$		--	--	40	

Electrical characteristics, at=25℃, unless otherwise specified

Static Characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	80	--	--	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.0	--	4.0	
Zero gate voltage drian current	I_{DSS}	V_{DS}=30V, V_{GS}=0V,T_J=25℃	--	--	20	μA
		V_{DS}=30V, V_{GS}=0V,T_J=125℃	--	--	250	
Gate-source leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	--	--	±200	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=53A	--	7.5	9.4	mΩ
Gate resistance	R_G		--	1.5	--	Ω
Transconductance	g_{fs}	V_{DS}=25V, I_D=53A	67	--	--	S

Dynamic Characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Iutput capacitance	C_{iss}	V_{GS}=0V V_{DS}=25V f=1MHz	--	3270	--	pF
Output capacitance	C_{oss}		--	420	--	
Reverse transfer capacitance	C_{rss}		--	240	--	
Turn-on delay time	$t_{d(on)}$	V_{DD}=38V V_{GS}=10V I_D=53A R_G=6.2Ω	--	18	--	nS
Risse time	t_r		--	79	--	
Turn-off delay time	$t_{d(off)}$		--	40	--	
Fall time	t_f		--	45	--	

Gate Charge Characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Gate to source charge	Q_{gs}	I_D=53A V_{DS}=60V V_{GS}=10V	--	71	110	nC
Gate to drain charge	Q_{gd}		--	19	29	
Gate charge total	Q_g		--	28	42	

Reverse Diode

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Diode continous forward current	I_S	T_C=25℃	--	--	70	A
Diode pulse current	$I_{S,pulse}$	T_C=25℃	--	--	350	
Diode forard voltage	V_{SD}	V_{GS}=0V, I_F=53A, T_C=25℃	--	--	1.3	V
Reverse recovery time	t_{rr}	V_{DD}=25V, I_F=53A di_F/dt=100A/μs T_J=25℃	--	46	69	μS
Reverse recovery charge	Q_{rr}		--	80	120	nC

FIG-1: Typical Output Characteristics

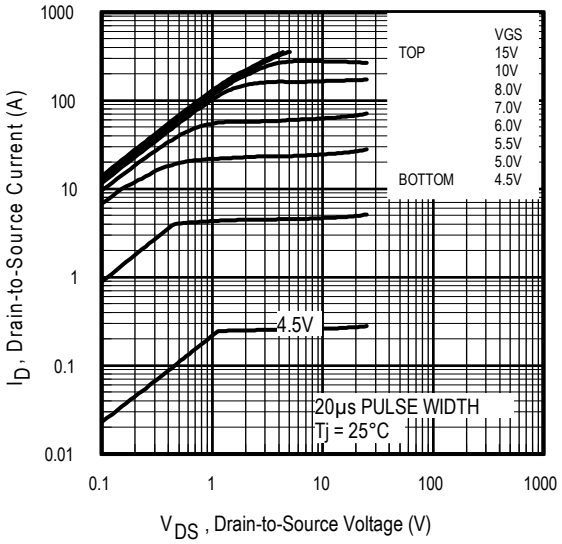


FIG-2: Typical Output Characteristics

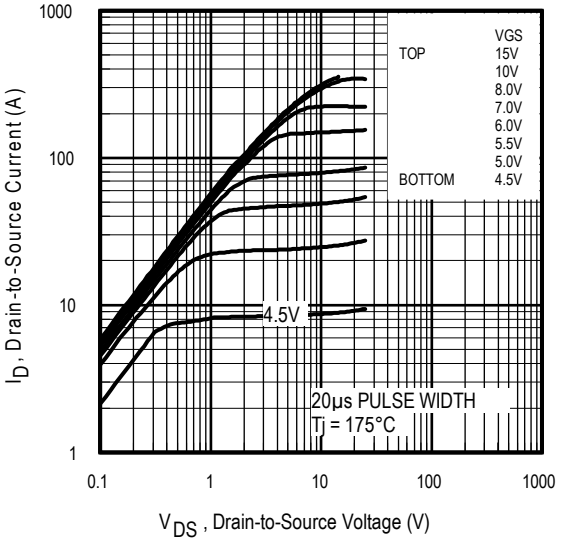


FIG-3: Typical Transfer Characteristics

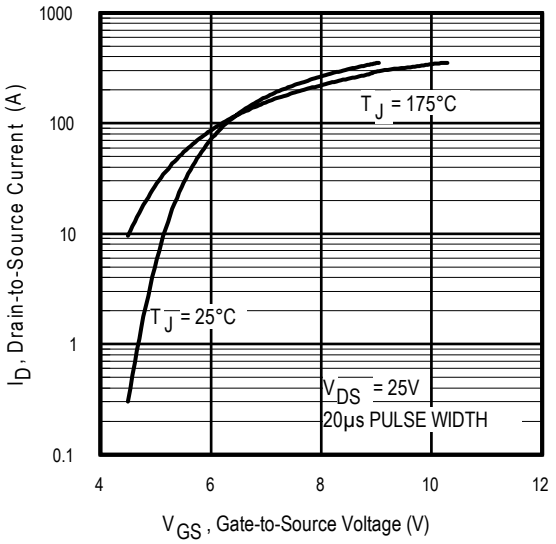


FIG-4: Typical Forward Transconductance vs. Drain Current

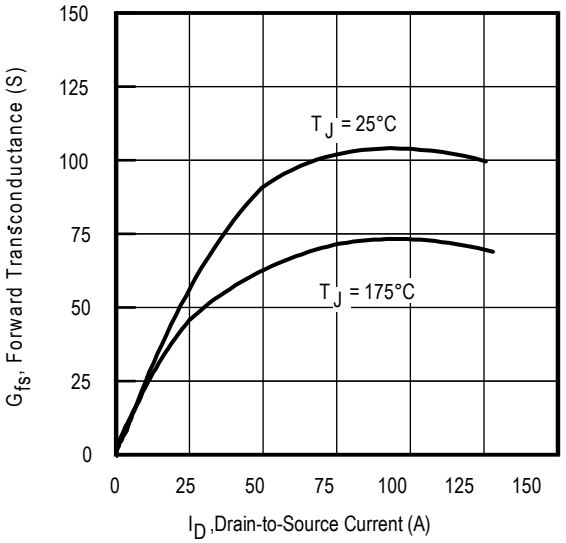


FIG-5: Typical Capacitance vs. Drain-to-Source Voltage

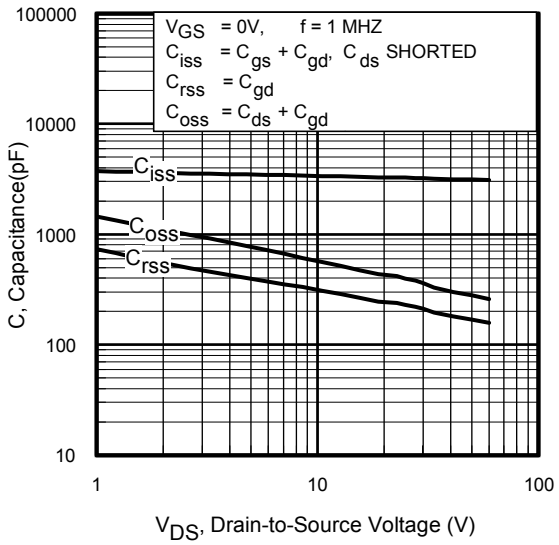


FIG-6: Typical Gate Charge vs. Gate-to-Source Voltage

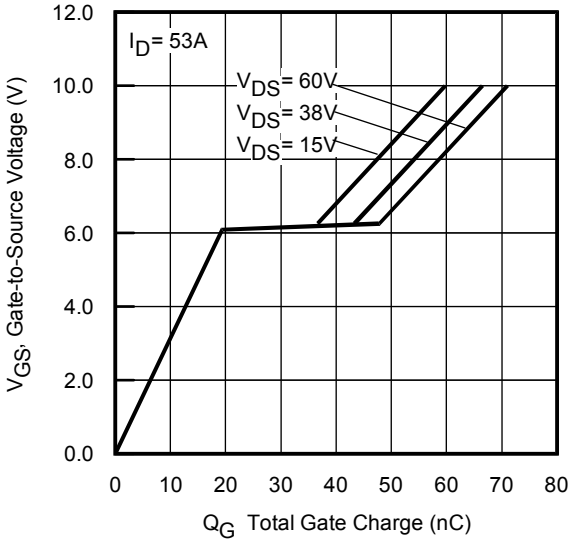


FIG-7: Typical Source-Drain Diode Forward Voltage

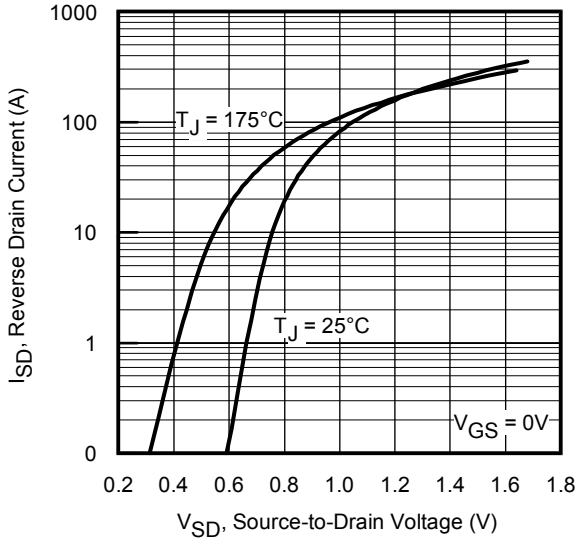


FIG-8: Maximum Safe Operating Area

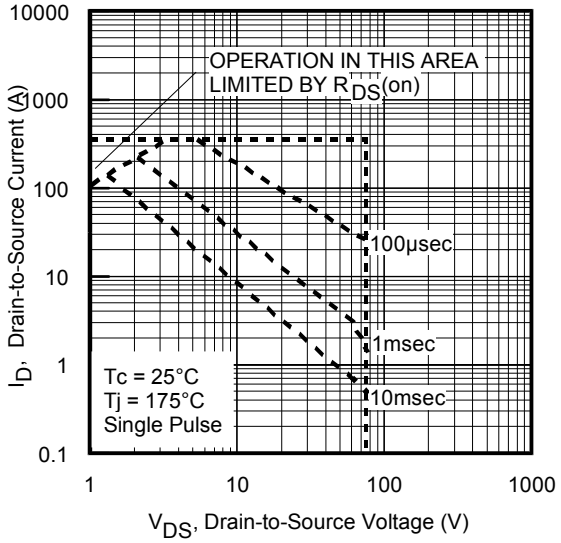


FIG-9: Maximum Drain Current vs. Case Temperature

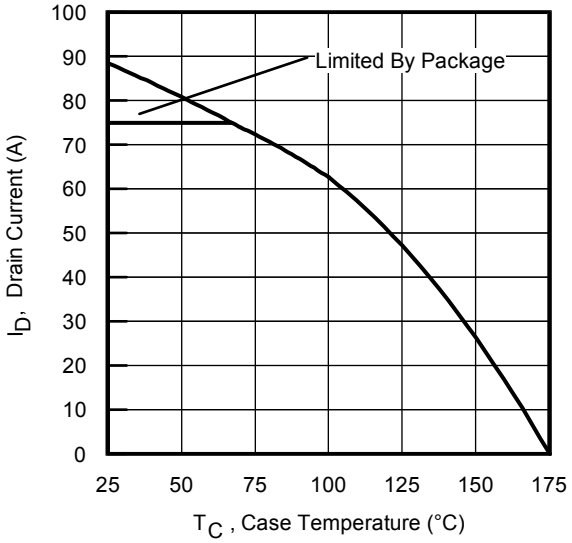


FIG-10: Normalized On-Resistance vs. Temperature

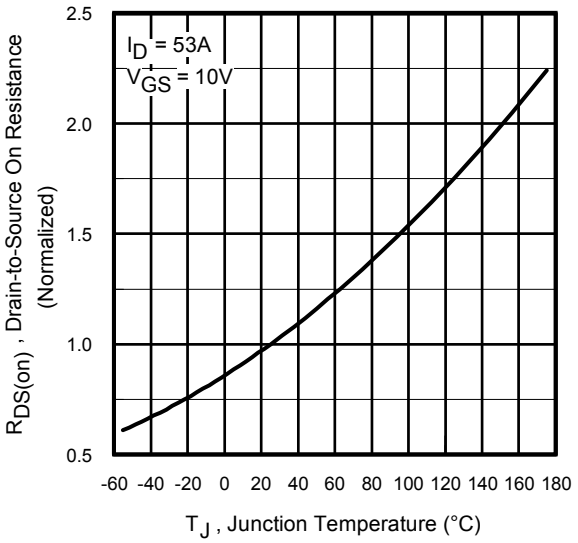
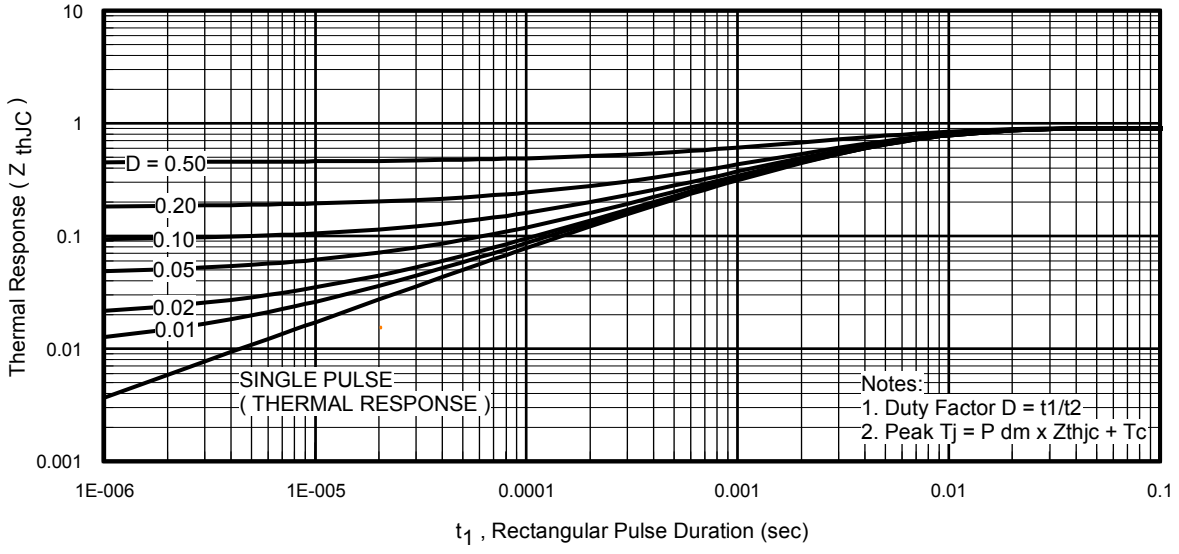


FIG-11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



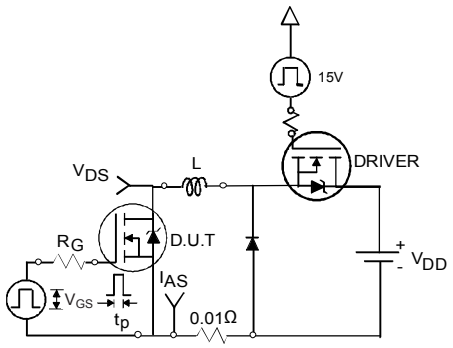


FIG-12A: Unclamped Inductive Test Circuit

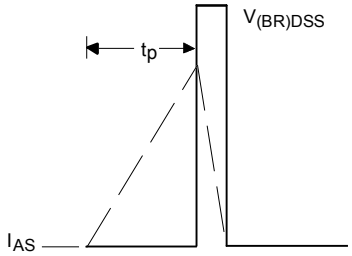


FIG-12B: Unclamped Inductive Waveforms

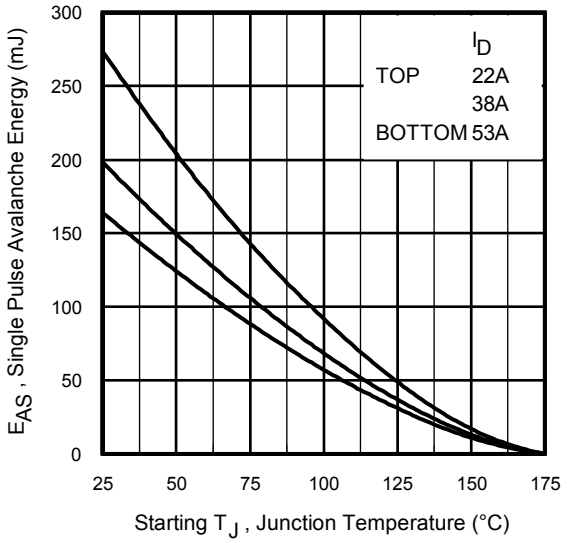


FIG-12C: Maximum Avalanche Energy vs. Drain Current

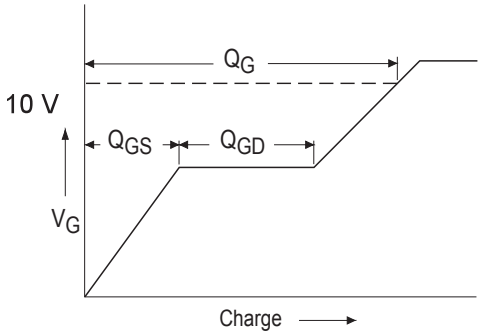


FIG-13A: Basic Gate Charge Waveform

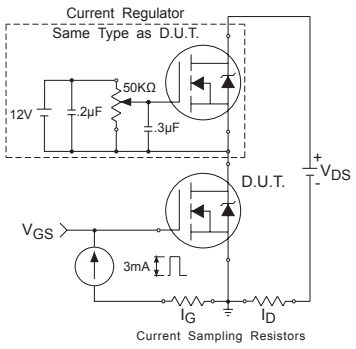


FIG-13B: Gate Charge Test Circuit

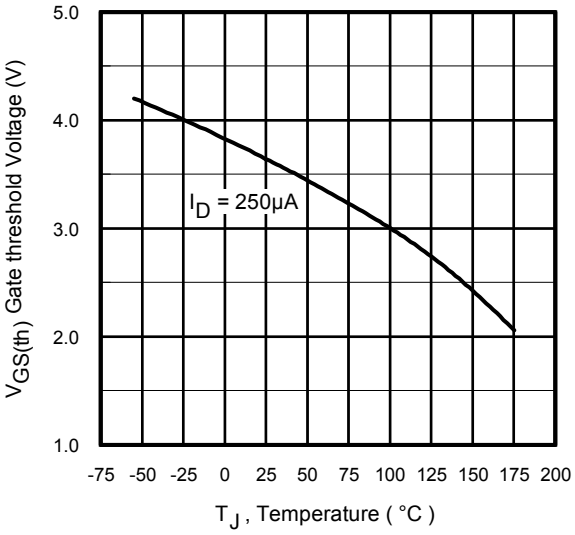


FIG-14: Threshold Voltage vs. Temperature

FIG-15: Typical Avalanche Current vs.Pulsewidth

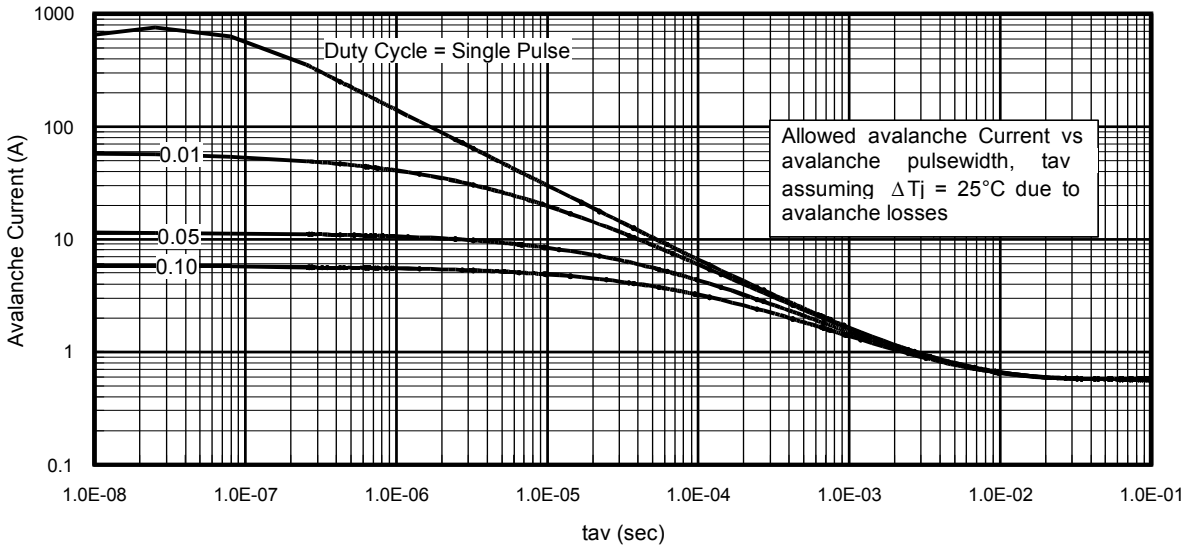


FIG-16: Maximum Avalanche Energy vs. Temperature

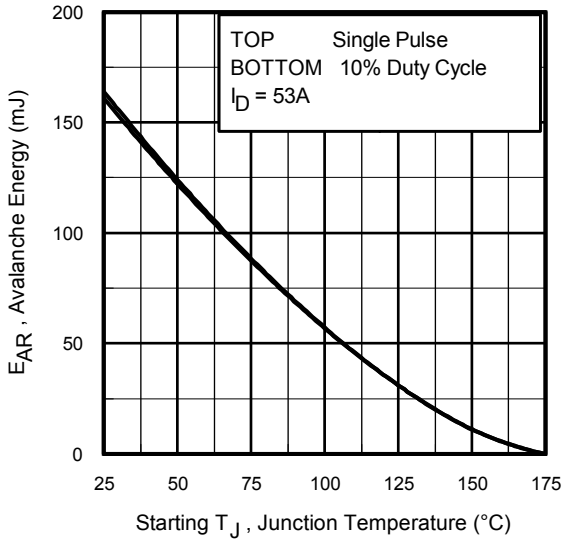
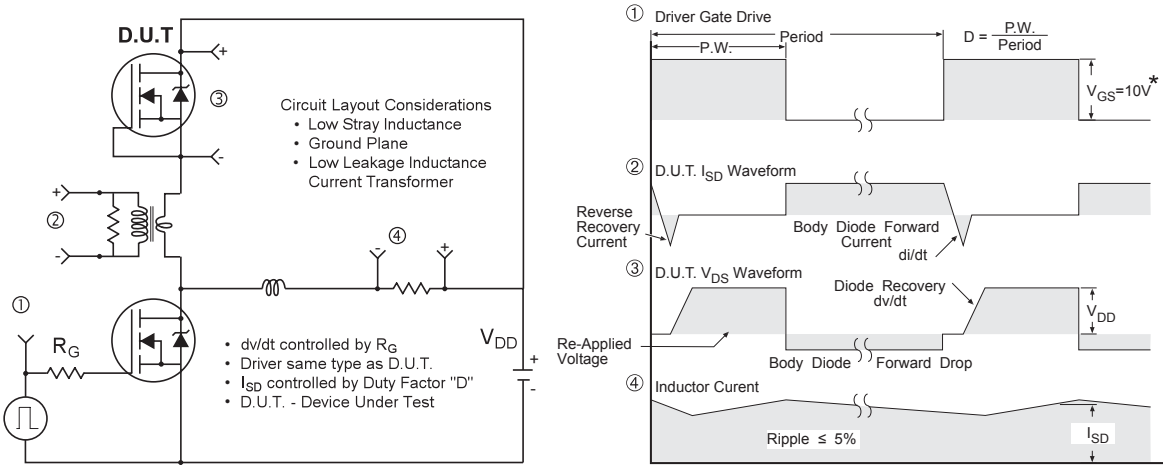


FIG-17: Peak Diode Recovery dv/dt Test Circuit for N-Channel



* V_{GS} = 5V for Logic Level Devices

FIG-18A: Switching Time Test Circuit

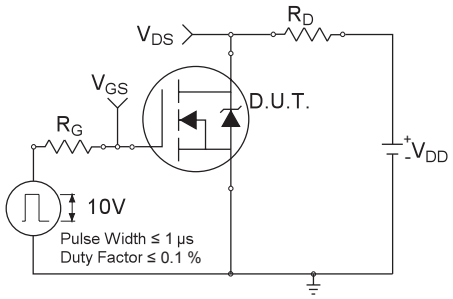
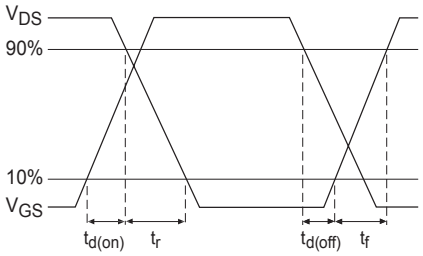
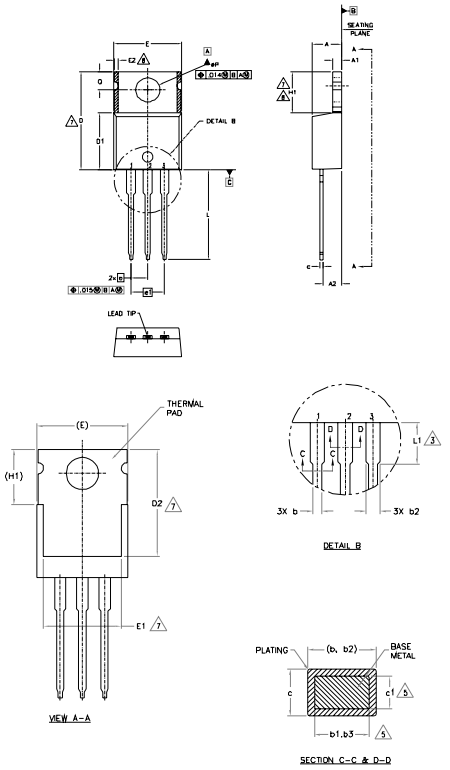


FIG-18B: Switching Time Waveforms



TO-220 Package Outline



SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	3.56	4.83	.140	.190	
A1	0.51	1.40	.020	.055	
A2	2.03	2.92	.080	.115	
b	0.38	1.01	.015	.040	
b1	0.38	0.97	.015	.038	5
b2	1.14	1.78	.045	.070	
b3	1.14	1.73	.045	.068	5
c	0.36	0.61	.014	.024	
c1	0.36	0.56	.014	.022	5
D	14.22	16.51	.560	.650	4
D1	8.38	9.02	.330	.355	
D2	11.68	12.88	.460	.507	7
E	9.65	10.67	.380	.420	4,7
E1	6.86	8.89	.270	.350	7
E2	–	0.76	–	.030	8
e	2.54 BSC		.100 BSC		
e1	5.08 BSC		.200 BSC		
H1	5.84	6.86	.230	.270	7,8
L	12.70	14.73	.500	.580	
L1	3.56	4.06	.140	.160	3
øP	3.54	4.08	.139	.161	
Q	2.54	3.42	.100	.135	

产品包装规格 Packing Specification

器件型号	打印标识	封装外形	封装标识	每管	每盒	每箱
HPP120N08STA	HPP120N08STA	TO-220	T	50Pcs	1K	5K

1Pcs=1只，1K=1Kpcs=1000Pcs=1000只

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