



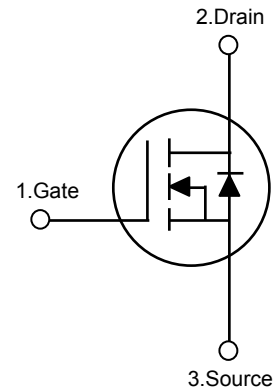
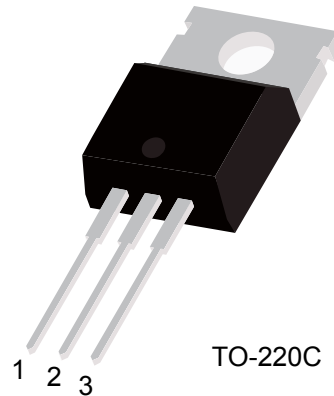
110A, 55V
N-CHANNEL POWER MOSFET

Features

- Advanced process technology
- Ultra low On-Resistance
- 175 °C Operating Temperature
- Fast Switching
- Repetitive Avalanche Allowed up to T_{jmax}
- Lead-Free

Product Summary

V_{DS}	55	V
$R_{DS(ON)}$ Max.	8.0	mΩ
I_D	110	A



ORDERING INFORMATION

Order Number	Package	Pin Assignment			Packing
		1	2	3	
HPP080NE5SPA	TO-220C	G	D	S	Tube, BOX

ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Drain source voltage	V_{DS}		55	V
Gate source voltage	V_{GS}		±20	
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	110	A
		$T_C=100^\circ\text{C}$	80	
Pulsed Drain Current	$I_{D,pulse}$	$T_C=25^\circ\text{C}$	390	
Avalanche energy, single pulse	E_{AS}	$I_{AS}=I_{AR}, V_{DD}=50V$	1150	mJ
Peak Diode Recovery dv/dt	dv/dt		5	KV/μS
Power dissipation	P_{tot}	$T_C=25^\circ\text{C}$	68	W
Operating and storage temperature	T_J, T_{stg}		-55 to 150	°C
Soldering Temperature, for 10 seconds	300 (1.6mm from case)			°C

**Thermal characteristics**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Thermal resistance, junction-case	R_{thJC}		--	--	0.75	°C/W
Case-to-Sink, Flat, Greased Surface	R_{thcs}		0.24	--	--	
Junction-to-Ambient	R_{thJA}		--	--	40	

Electrical characteristics, at=25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	55	--	--	V
Gate source voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	2	--	4	
Zero gate voltage drian current	I_{DSS}	$V_{DS}=55V$, $V_{GS}=0V$, $T_J=25^\circ C$	--	0.1	1	μA
		$V_{DS}=55V$, $V_{GS}=0V$, $T_J=125^\circ C$	--	1	100	
Gate-source leakage current	I_{GSS}	$V_{DS}=0V$, $V_{GS}=\pm 20V$	--	± 10	± 100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V$, $I_D=55A$	--	6.8	8.0	m Ω
Gate Resistance	R_G		--	1.9	--	Ω
Transconductance	g_{fs}	$ V_{DS} >2\times I_D \times R_{DS(on)max}$ $I_D=55A$	17	--	--	S

Dynamic Characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
lutput capacitance	C_{iss}	$V_{GS}=0V$ $V_{DS}=25V$ $f=1MHz$	--	3300	--	pF
Output capacitance	C_{oss}		--	670	--	
Reverse transfer capacitance	C_{rss}		--	120	--	
Turn-on delay time	$t_{d(on)}$	$V_{DS}=25V$ $V_{GS}=10V$ $I_D=55A$ $R_G=3\Omega$	--	19	--	nS
Risse time	t_r		--	50	--	
Turn-off delay time	$t_{d(off)}$		--	55	--	
Fall time	t_f		--	24	--	

**Gate Charge Characteristics**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Gate to source charge	Q _{gs}	V _{DS} =44V I _D =55A V _{GS} =10V	--	112	--	nC
Gate to drain charge	Q _{gd}		--	23	--	
Gate charge total	Q _g		--	35	--	

Reverse Diode

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Diode continuous forward current	I _S	T _C =25°C	--	--	110	A
Diode pulse current	I _{S,pulse}	T _C =25°C	--	--	390	
Diode forward voltage	V _{SD}	V _{GS} =0V I _F =110A, T _C =25°C	--	--	1.0	V
Reverse recovery time	t _{rr}	V _{GS} =0V, I _S =110A di _F /dt=100A/μs	--	62	--	μs
Reverse recovery charge	Q _{rr}		--	137	--	nC



Test Circuits and Waveforms

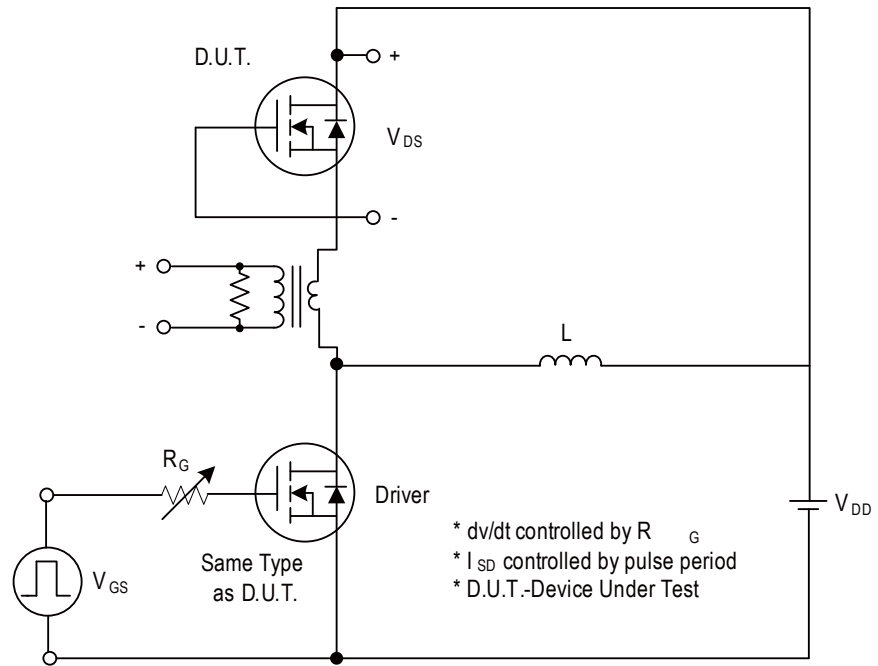


Fig-1A: Peak Diode Recovery dv/dt Test Circuit

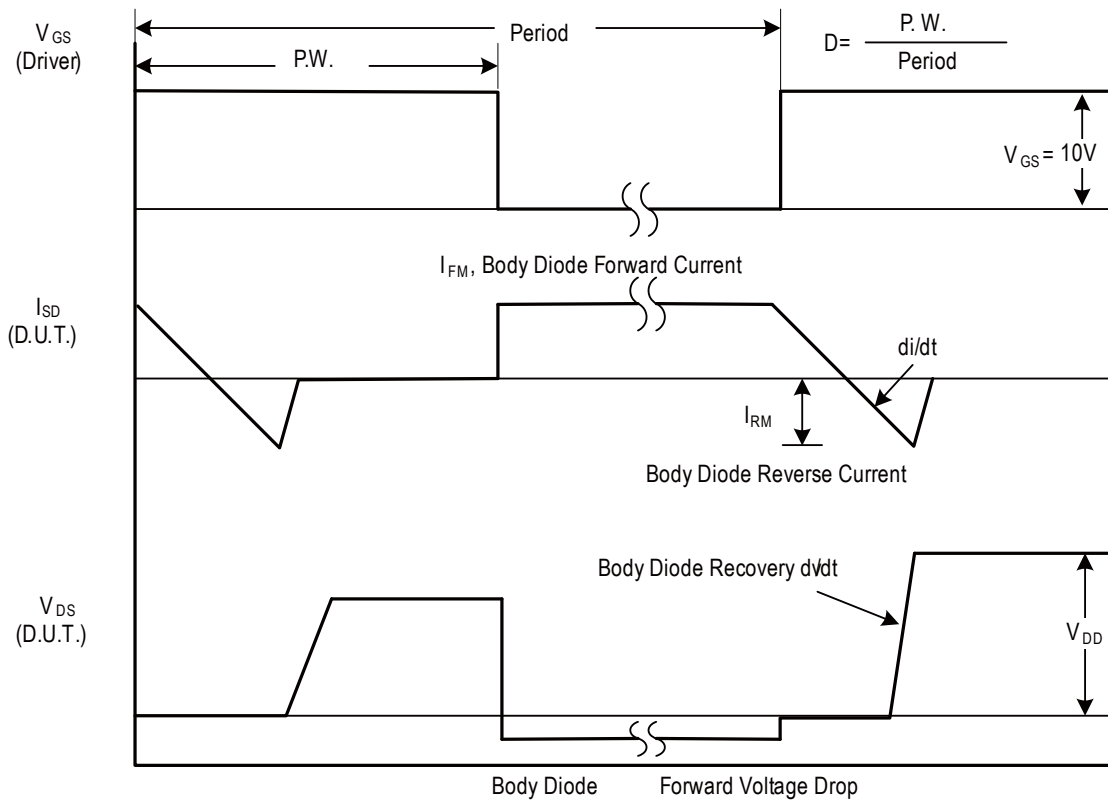


Fig-1B: Peak Diode Recovery dv/dt Waveforms



Test Circuits and Waveforms

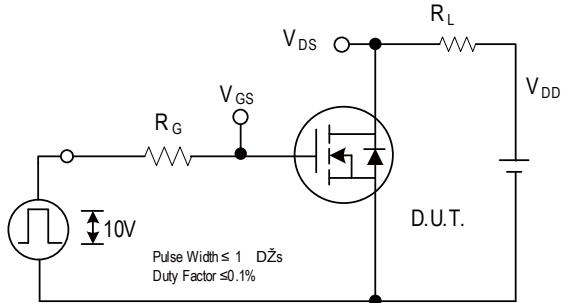


Fig-2A: Switching Test Circuit

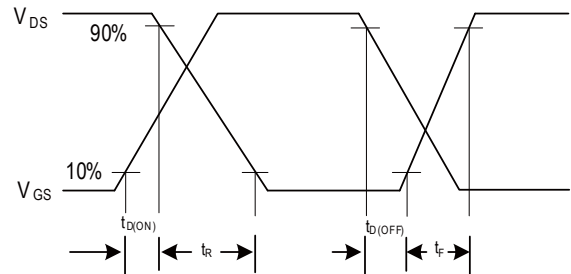


Fig-2B: Switching Waveforms

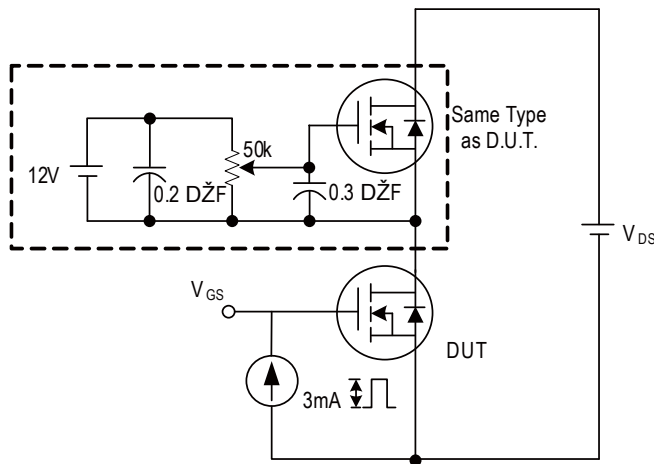


Fig-3A: Gate Charge Test Circuit

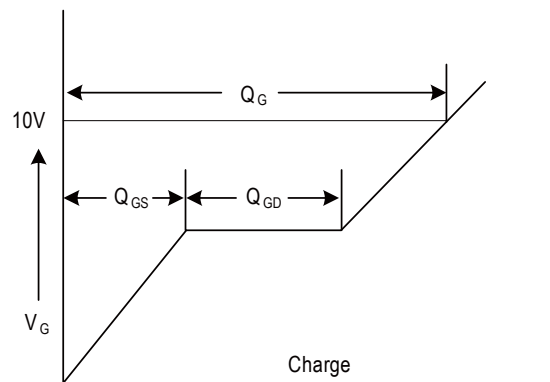


Fig-3B: Gate Charge Waveform

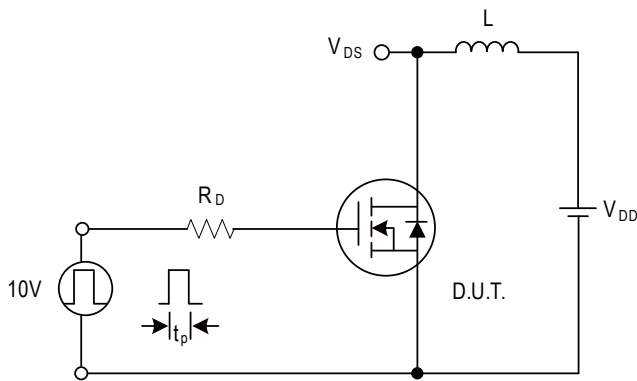


Fig-4A: Unclamped Inductive Switching Test Circuit

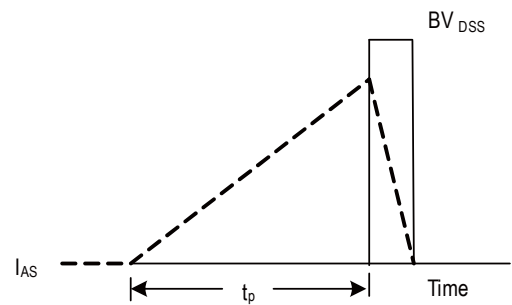


Fig-4B: Unclamped Inductive Switching Waveforms

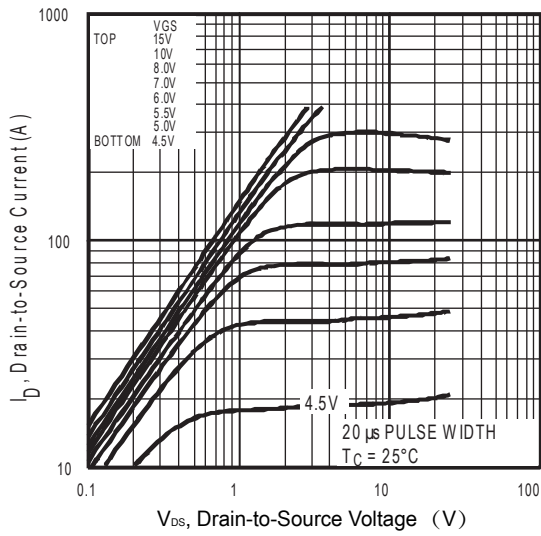


Fig-1: Typical Output Characteristics

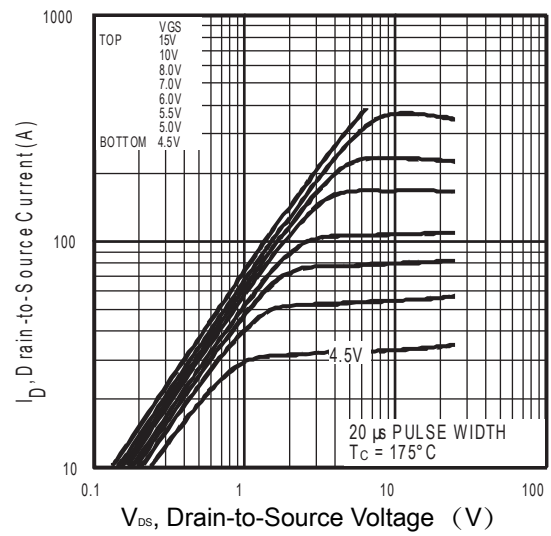


Fig-2: Typical Output Characteristics

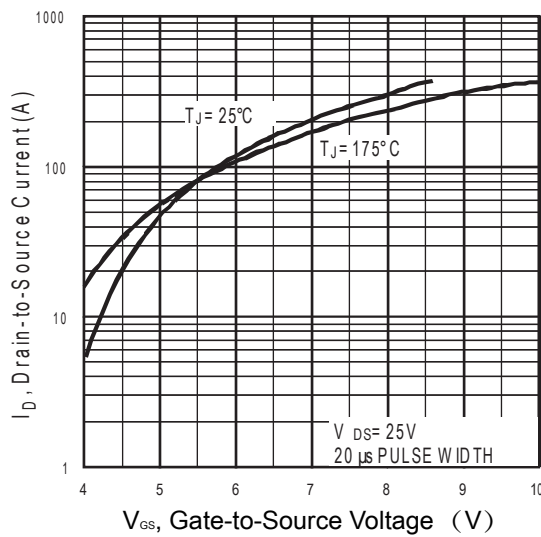


Fig-3: Typical Transfer Characteristics

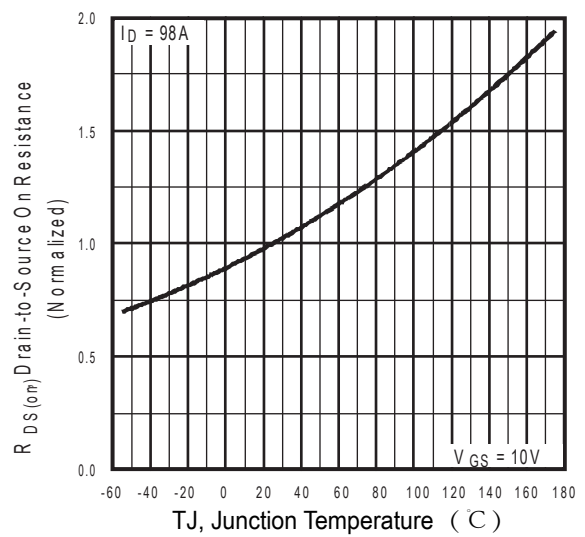


Fig-4: Normalized On-Resistance Vs. Temperature

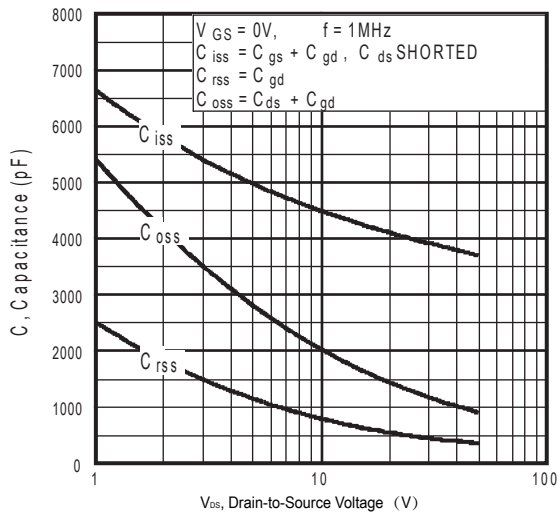


Fig-5: Typical Capacitance Vs. Drain-to-Source Voltage

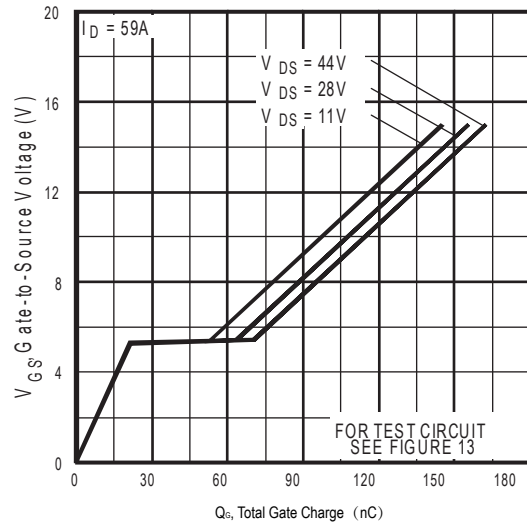


Fig-6: Typical Gate Charge Vs. Gate-to-Source Voltage

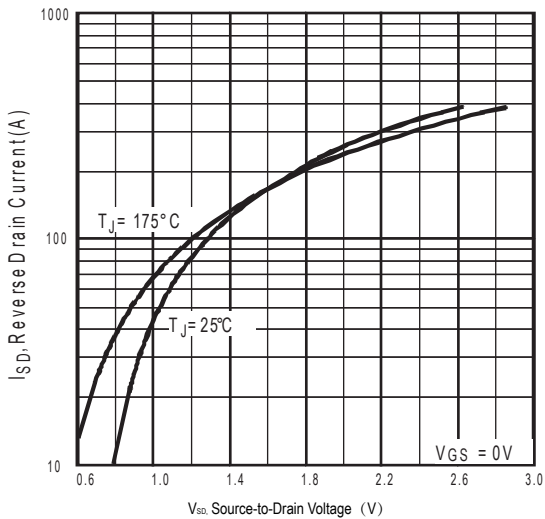


Fig-7: Typical Source-Drain Diode Forward Voltage

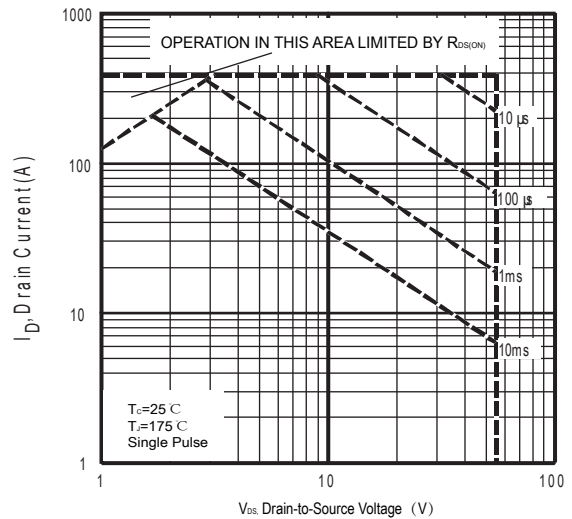


Fig-8: Maximum Safe Operating Area

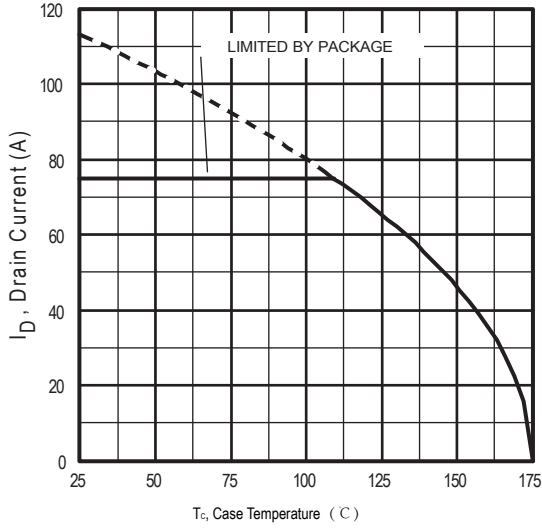


Fig-9: Maximum Drain Current Vs. Case Temperature

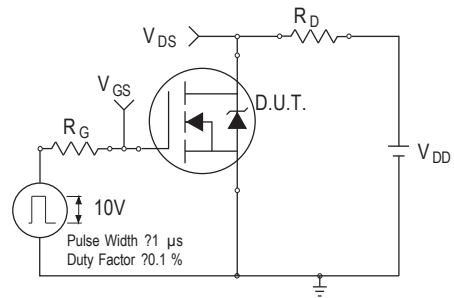


Fig-10A: Switching Time Test Circuit

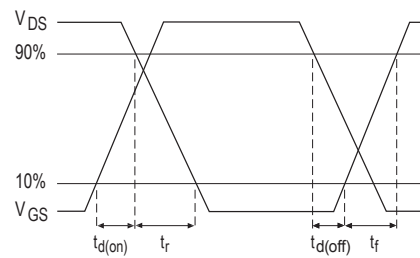


Fig-10B: Switching Time Waveforms

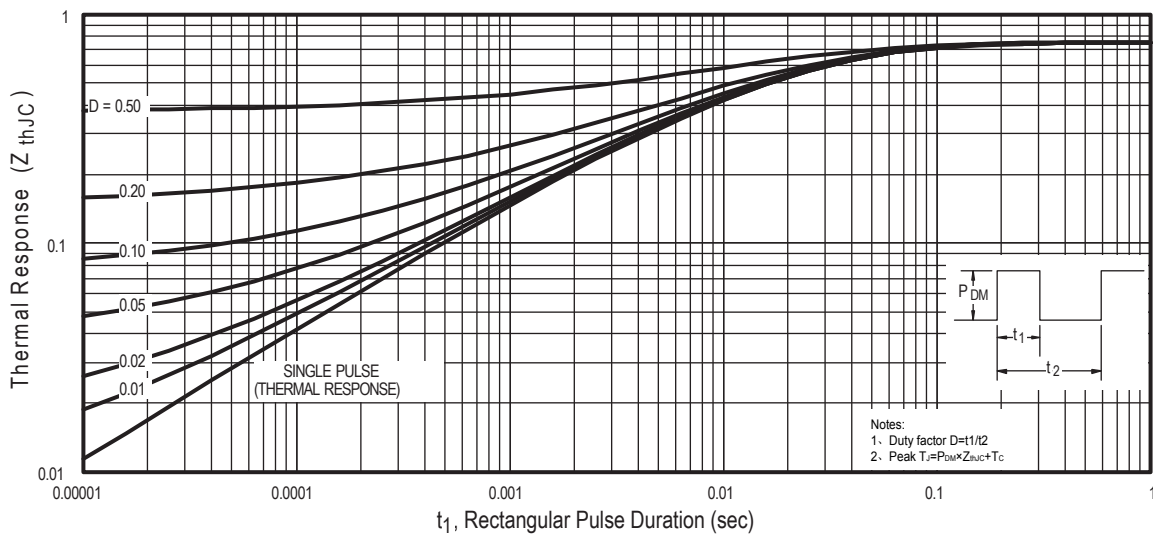


Fig-11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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