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SPD30P06PG

P-Channel Enhancement Mode MOSFET

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Features

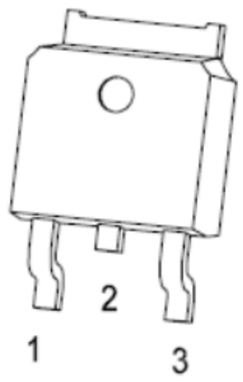
- V_{DS} =-60V,I_D =-16A
  $R_{DS(ON)}$ 55mΩ @ V_{GS}=-10V (Typ)

Application

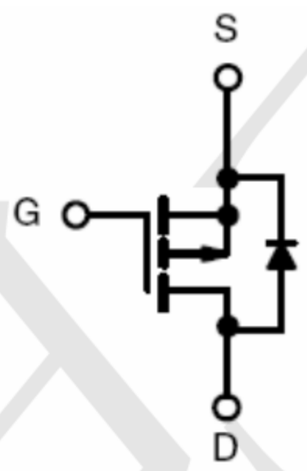
- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

Package and Pin Configuration

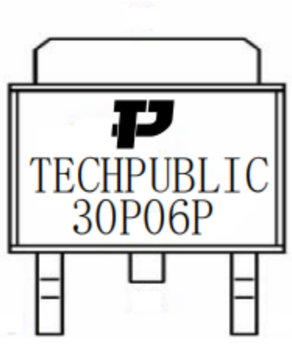
TO-252



1. GATE
2. DRAIN
3. SOURCE



Marking



Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	-16	A
Drain Current-Continuous(T_C=100℃)	I_D (70℃)	-10.5	A
Pulsed Drain Current	I_{DM}	-53	A
Maximum Power Dissipation	P_D	20	W
Derating factor		0.4	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	35	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

Thermal Characteristic

Thermal Resistance, Junction-to-Case (Note 2)	$R_{\theta JC}$	6.0	℃/W

Electrical Characteristics (T_A=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250uA	-1.0	-1.8	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-6A	-	55	60	mΩ
		V_{GS}=-4.5V, I_D=-4A		65	80	Ω
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-16A	-	10	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-30V,V_{GS}=0V, F=1.0MHz	-	1100	-	PF
Output Capacitance	C_{oss}		-	90.6	-	PF
Reverse Transfer Capacitance	C_{rss}		-	77.3	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-30V, R_L=1.5Ω, V_{GS}=-10V,R_G=3Ω	-	11	-	nS
Turn-on Rise Time	t_r		-	14	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	33	-	nS
Turn-Off Fall Time	t_f		-	13	-	nS
Total Gate Charge	Q_g	V_{DS}=-30,I_D=- 6A, V_{GS}=-10V	-	37.6		nC
Gate-Source Charge	Q_{gs}		-	4.3		nC
Gate-Drain Charge	Q_{gd}		-	7.2		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-16A	-		-1.2	V
Diode Forward Current (Note 2)	I_S			13		A
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF =- 13A di/dt = -100A/μs (Note3)	-	35		nS
Reverse Recovery Charge	Qrr		-	38		nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Typical Characteristics

Figure 1. Output Characteristics

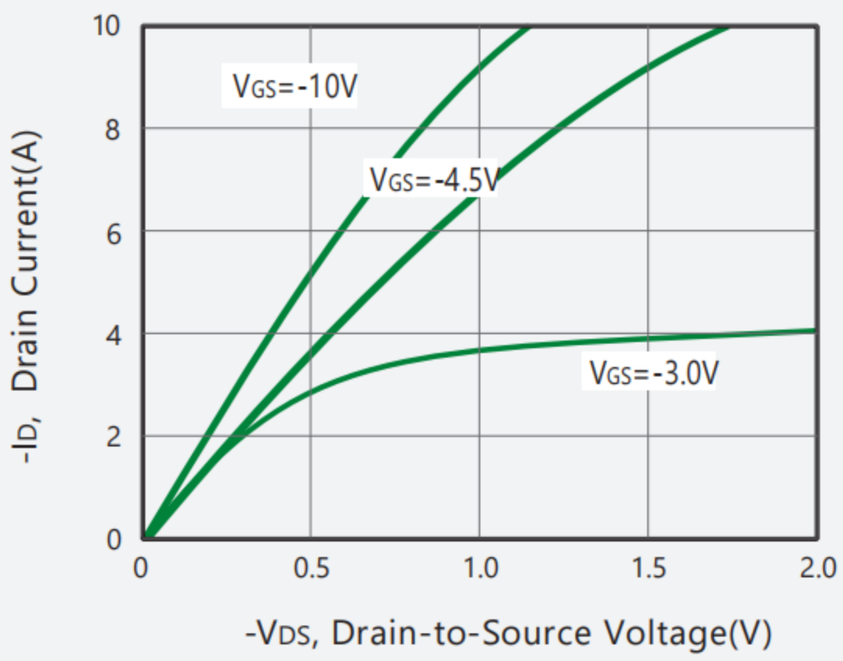


Figure 2. Body Diode Forward Voltage Variation with Source Current

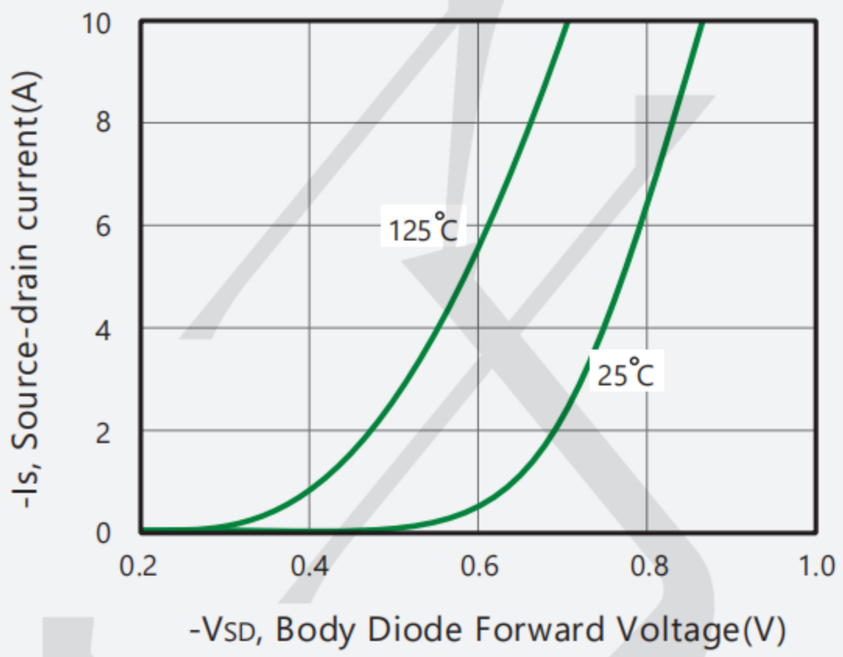


Figure 3. On-Resistance vs. Gate-Source Voltage

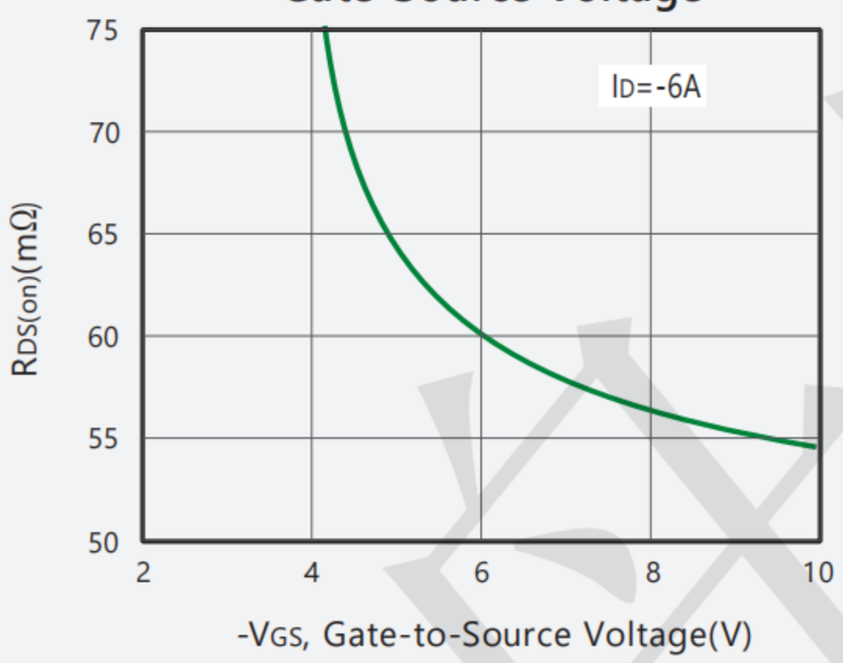


Figure 4. On-Resistance Variation with Drain Current and Temperature

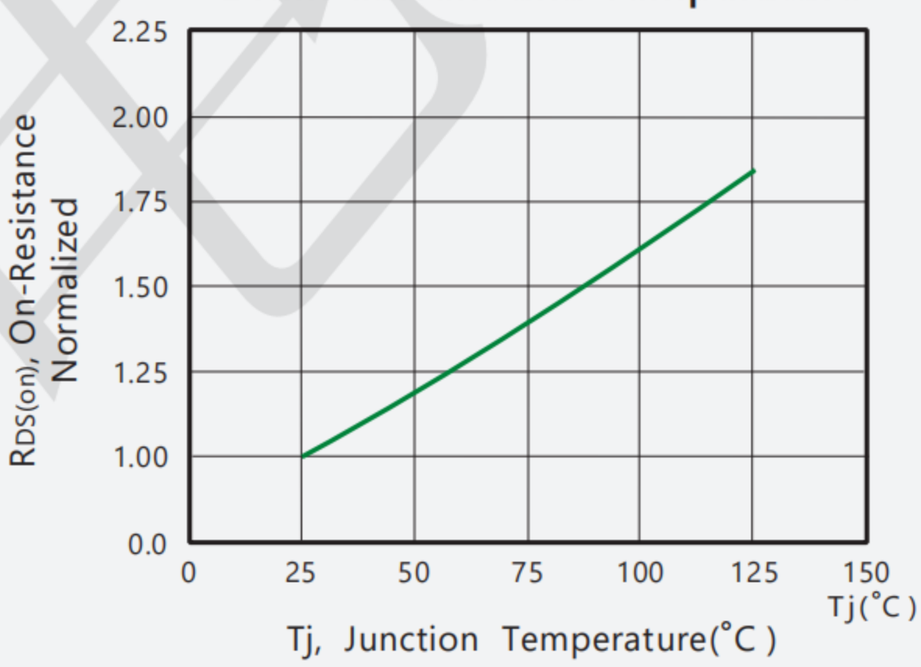


Figure 5. Gate Threshold Variation with Temperature

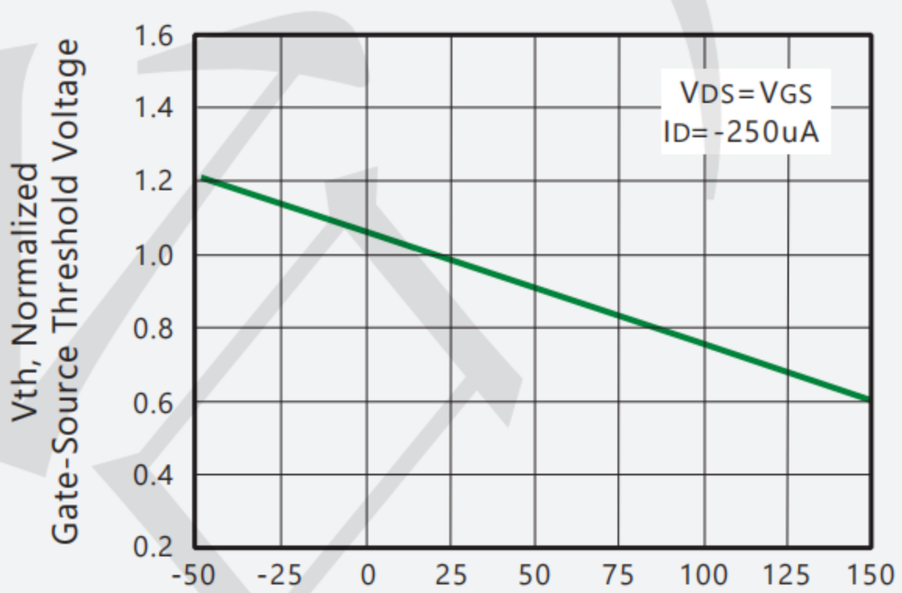


Figure 6. Gate Charge

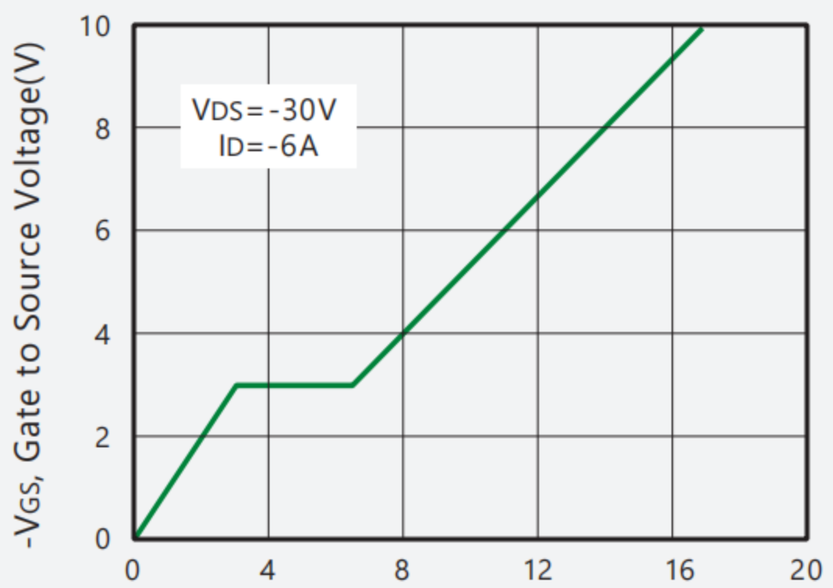


Figure 7. Capacitance

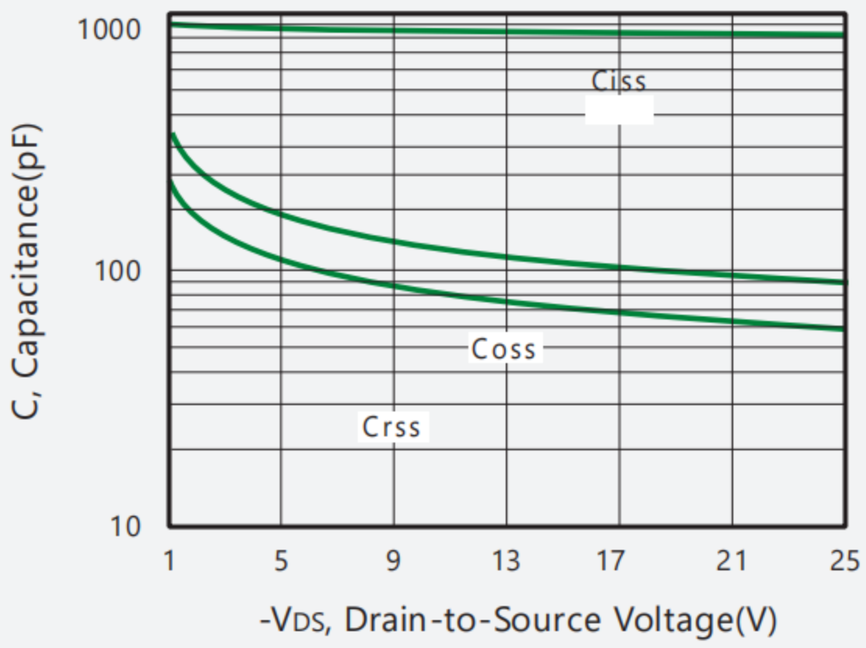
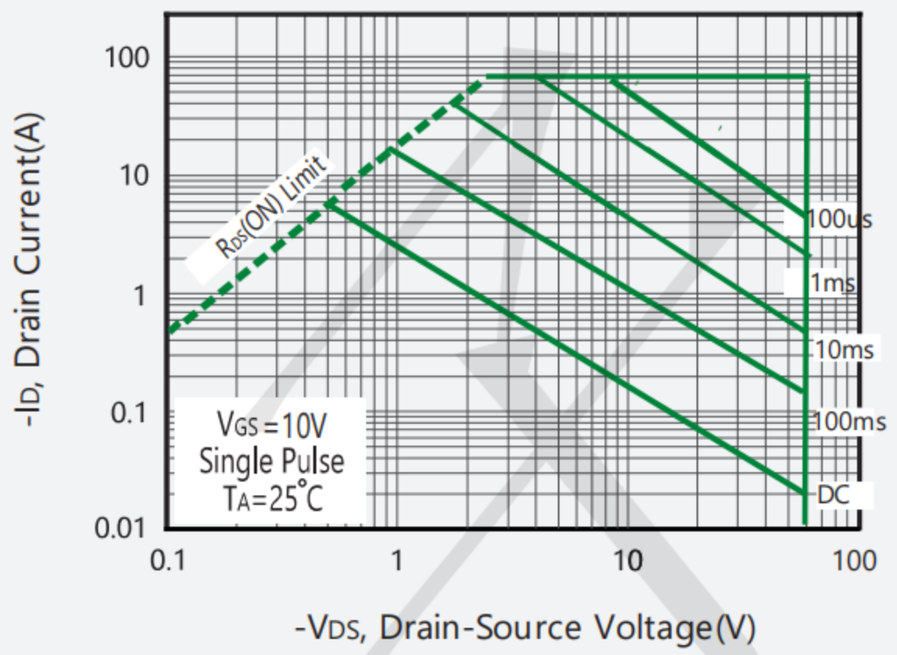


Figure 8. Maximum Safe Operating Area



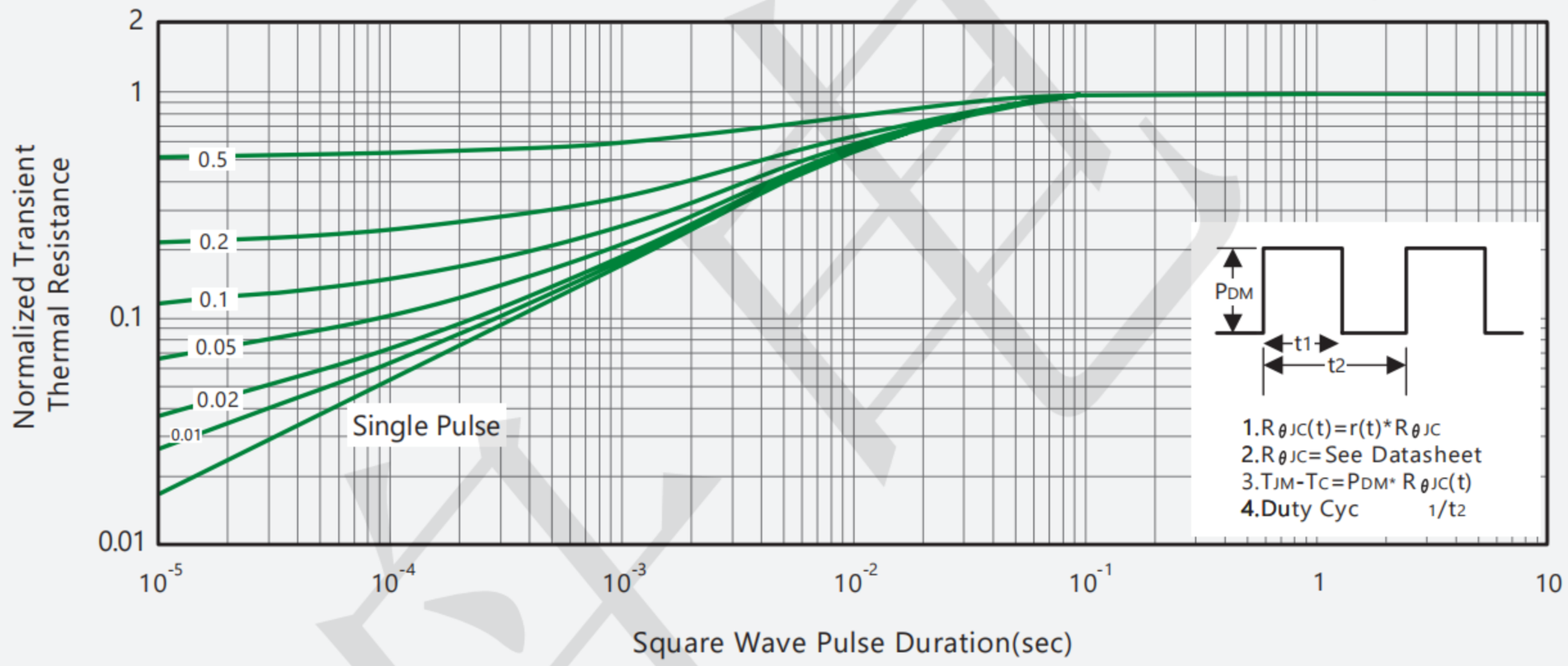
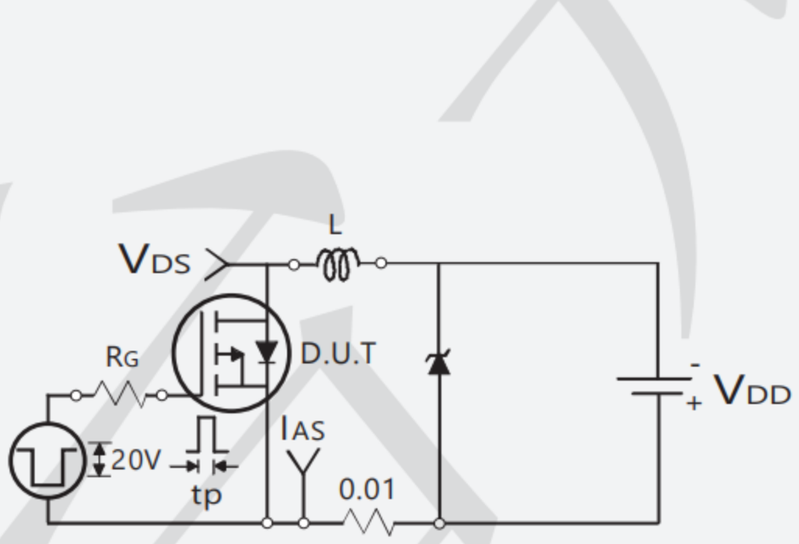
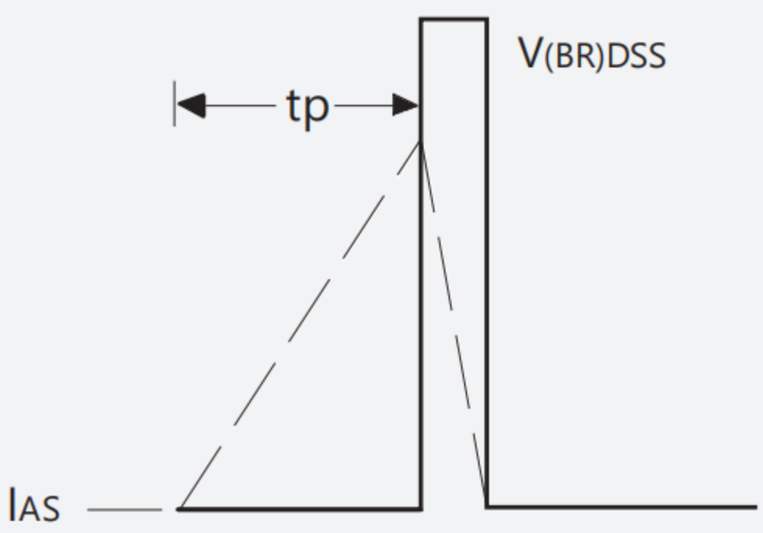


Figure 9. Normalized Thermal Transient Impedance Curve



Unclamped Inductive Test Circuit

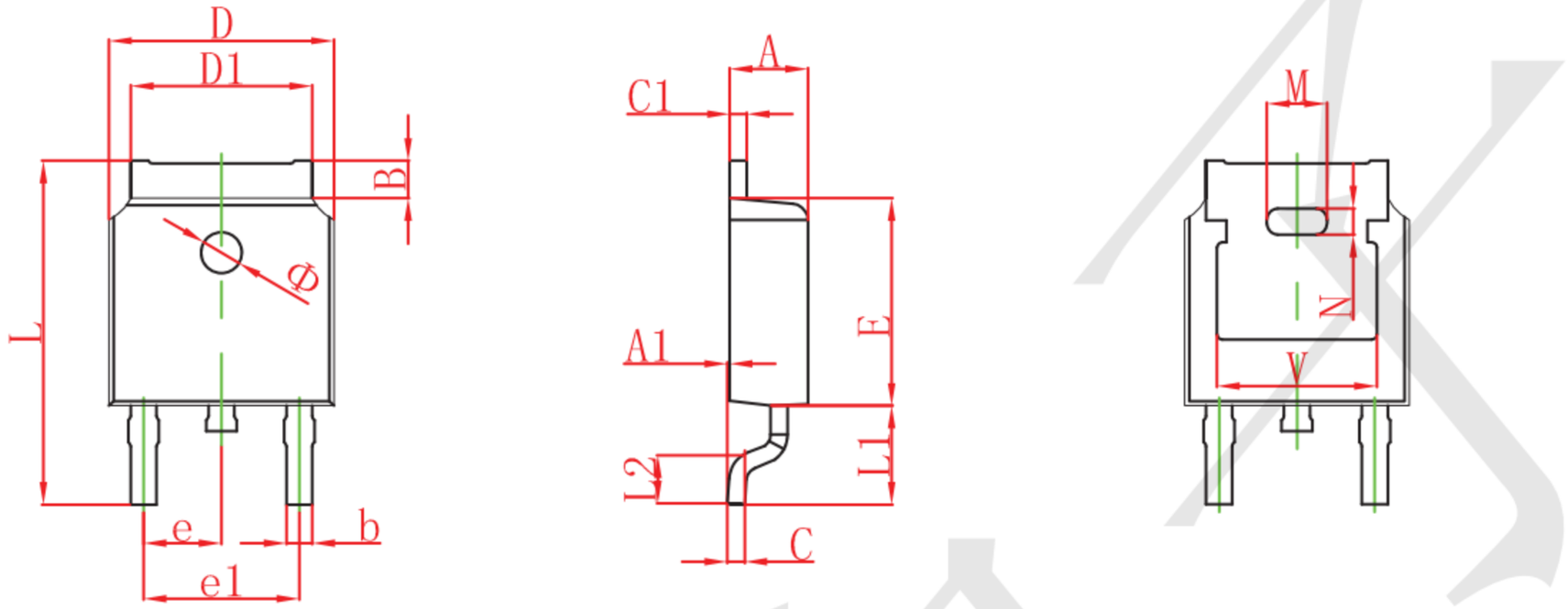
Figure 11a.



Unclamped Inductive Waveforms

Figure 11b.

TO252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
c	0.460	0.560	0.018	0.022
c1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	0.244
e	2.286 TYP.		0.090 TYP.	
e1	4.327	4.727	0.170	0.186
M	1.778REF.		0.070REF.	
N	0.762REF.		0.018REF.	
L	9.800	10.400	0.386	0.409
L1	2.9REF.		0.114REF.	
L2	1.400	1.700	0.055	0.067
V	4.830 REF.		0.190 REF.	
Φ	1. 100	1. 300	0. 043	0. 051

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