



82V N-Channel Trench MOSFET(Preliminary)

General Description

- Trench Power technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Optimized for fast-switching applications

Applications

- Synchronous Rectification in DC/DC and AC/DC Converters
- Isolated DC/DC Converters in Telecom and Industrial

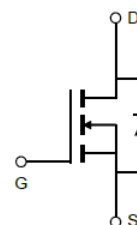
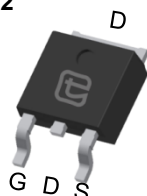
Product Summary

V_{DS}	82V
I_D (at $V_{GS}=10V$)	118A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	< 7m Ω

100% UIS Tested



TO-252



Part Number	Package Type	Form	Marking
TTD118N08A	TO-252	Tape&Reel	118N08A

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	82	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ^B	$T_C = 25^\circ\text{C}$	I_D	46	A
	$T_C = 100^\circ\text{C}$		30	
Pulsed Drain Current ^A		I_{DM}	264	A
Avalanche Current ^A		I_{AS}	52	A
Single Pulse Avalanche Energy ^A $L = 0.3\text{mH}$		E_{AS}	405	mJ
Power Dissipation ^C	$T_C = 25^\circ\text{C}$	P_D	217	W
	$T_C = 100^\circ\text{C}$		108	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 175	$^\circ\text{C}$

Thermal Characteristics

Parameter		Symbol	Maximum	Units
Maximum Junction-to-Case	Steady-State	$R_{\theta JC}$	0.69	$^\circ\text{C/W}$
Maximum Junction-to-Ambient	Steady-State	$R_{\theta JA}$	100	



Electrical Characteristics(T _J =25°C unless otherwise noted)							
Symbol	Parameter	Conditions		Value			Units
				Min	Typ	Max	
STATIC PARAMETERS							
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0V		82			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =82V, V _{GS} =0V	T _J =25°C			1	μA
			T _J =125°C			100	
I _{GSS}	Gate-Body Leakage Current	V _{DS} =0V, V _{GS} =± 20V				± 100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA		2	3	4	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =30A			6	7	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A			38		S
V _{SD}	Diode Forward Voltage	I _S =30A, V _{GS} =0V				1	V
I _S	Maximum Body-Diode Continuous Current ^B					105	A
DYNAMIC PARAMETERS							
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =40V, f =1MHz			6710		pF
C _{oss}	Output Capacitance				328		
C _{rss}	Reverse Transfer Capacitance				320		
R _g	Gate Resistance	f =1MHz			1.46		Ω
SWITCHING PARAMETERS							
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =40V, I _D =20A			123		nC
Q _{gs}	Gate Source Charge				32		
Q _{gd}	Gate Drain Charge				36		
t _{D(on)}	Turn-On Delay Time	V _{GS} =10V, V _{DS} =40V, I _D =20A, R _G =2.5Ω			24		ns
t _r	Turn-On Rise Time				19		
T _{D(off)}	Turn-Off Delay Time				70		
t _f	Turn-Off Fall Time				30		
t _{rr}	Body Diode Reverse Recovery Time	I _F =20A, di/dt =100A/μs			37		ns
Q _{rr}	Body Diode Reverse Recovery Charge				58		nC

A. Single pulse width limited by maximum junction temperature.

B. The maximum current rating is package limited.

C. The power dissipation P_D is based on $T_{J(MAX)} = 175^{\circ}\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

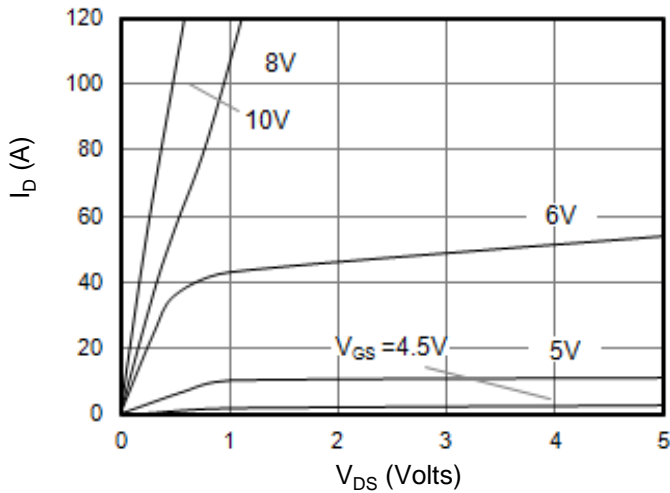


Figure 1: On-Region Characteristics

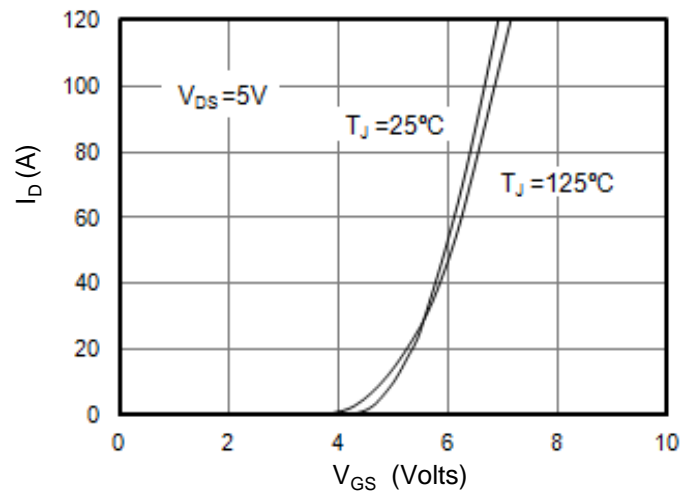


Figure 2: Transfer Characteristics

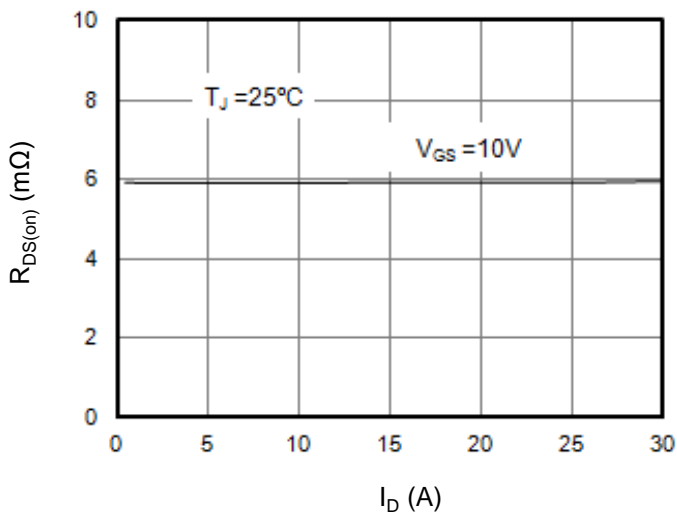


Figure 3: On-Resistance vs. Drain Current

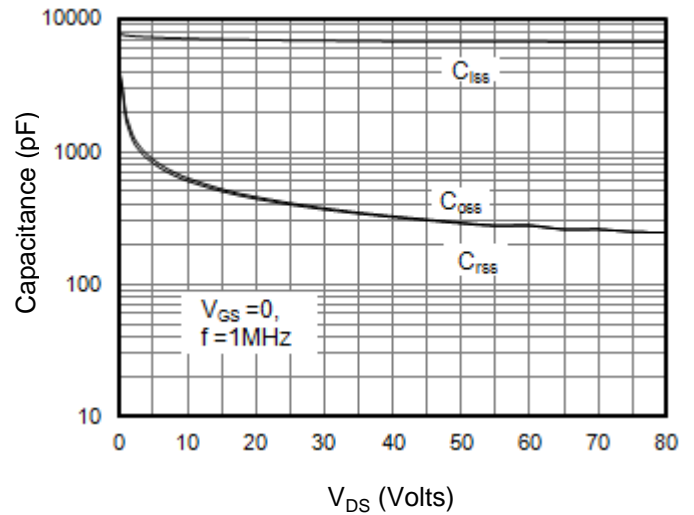


Figure 4: Capacitance Characteristics

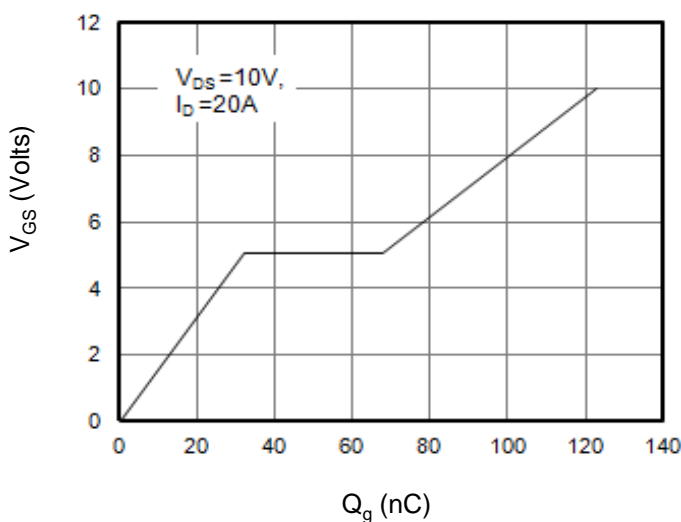


Figure 5: Gate Charge Characteristics

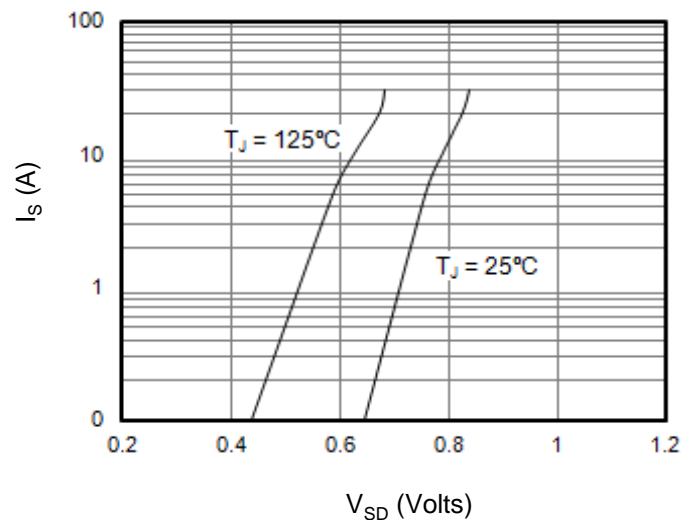


Figure 6: Body Diode Forward Voltage



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

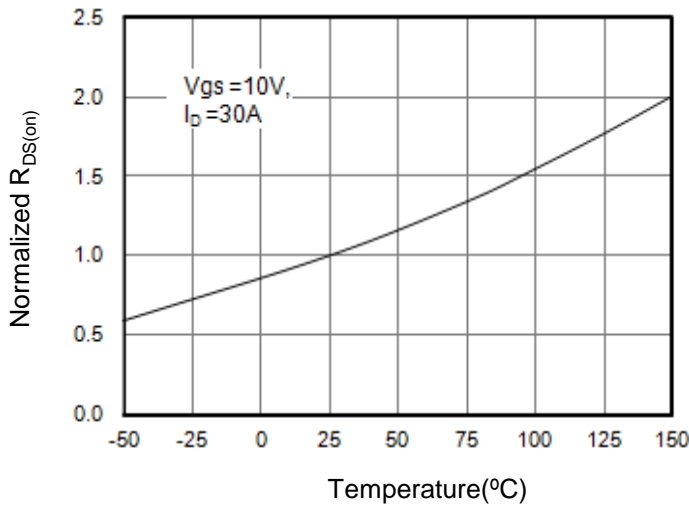


Figure 7: On-Resistance vs. Junction Temperature

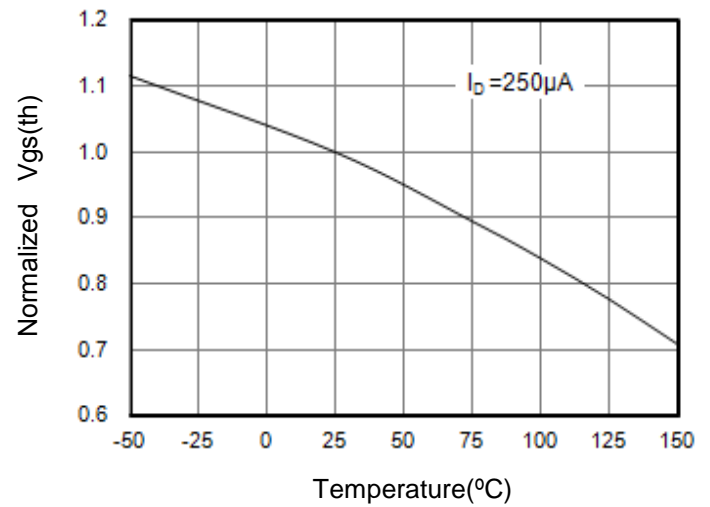
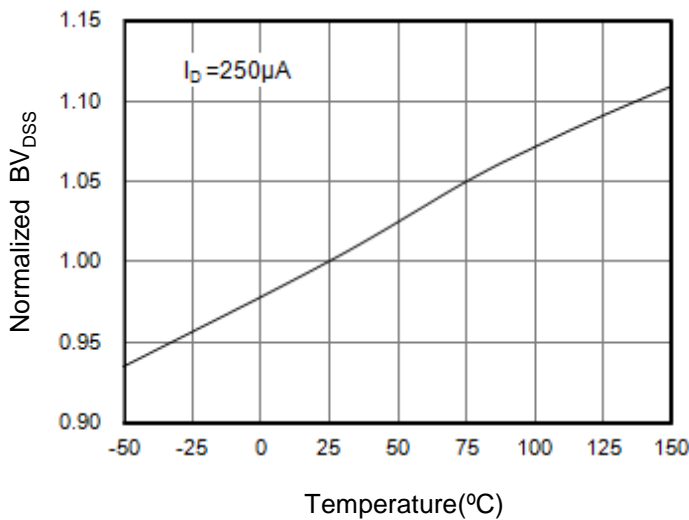
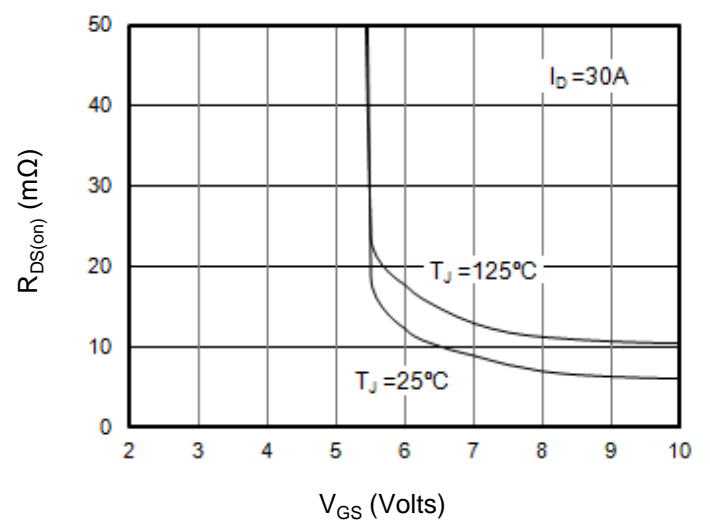
Figure 8: $V_{GS(th)}$ vs. Junction TemperatureFigure 9: BV_{DSS} vs. Junction Temperature

Figure 10: On-Resistance vs. Gate-Source Voltage

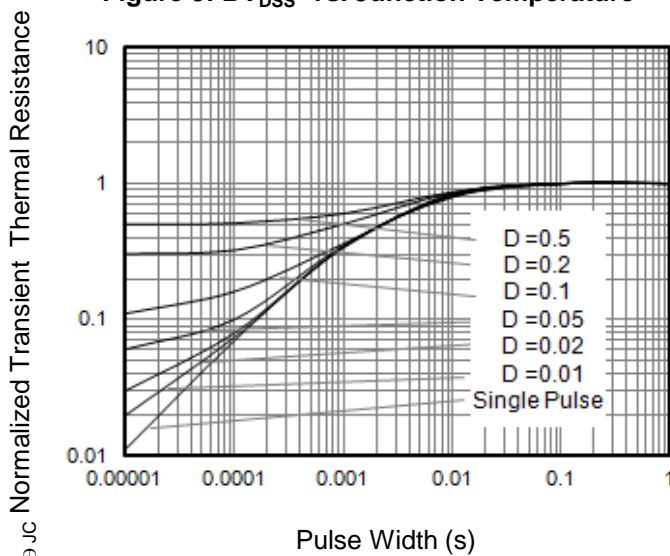


Figure 11: Normalized Transient Thermal Resistance

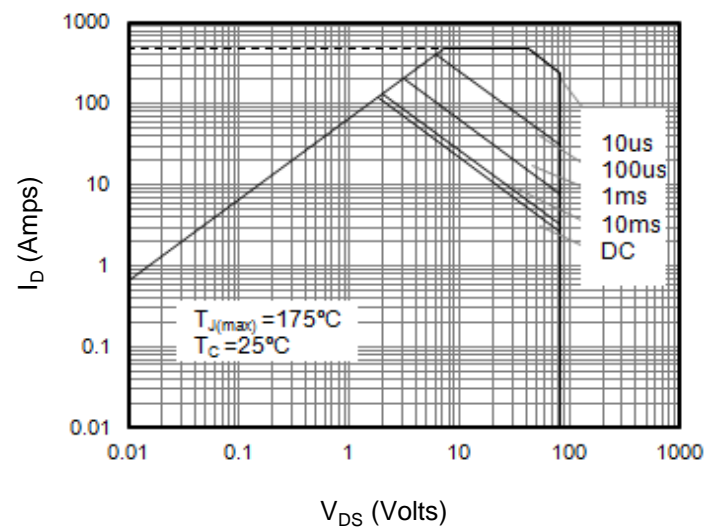


Figure 12: Safe Operating Area



Figure A: Gate Charge Test Circuit and Waveforms

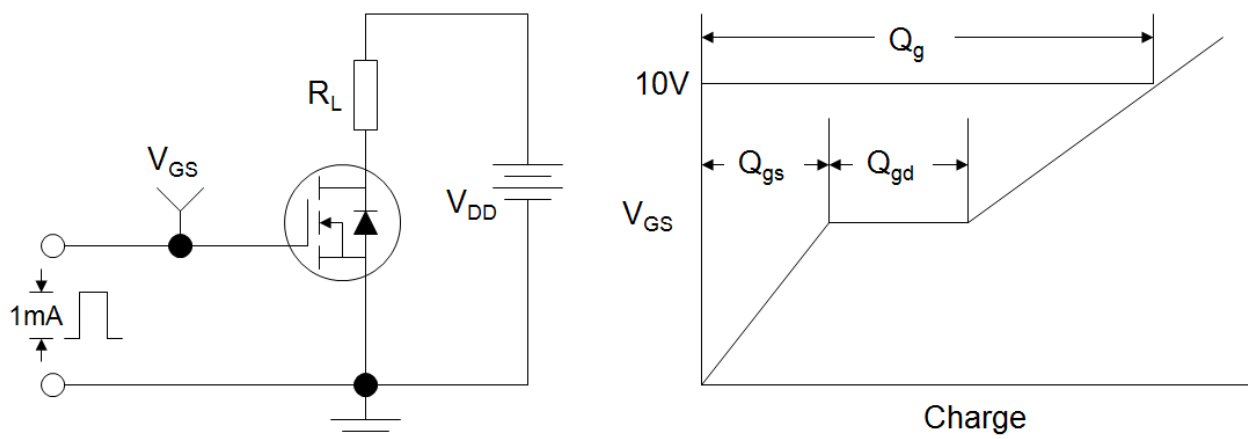


Figure B: Resistive Switching Test Circuit and Waveforms

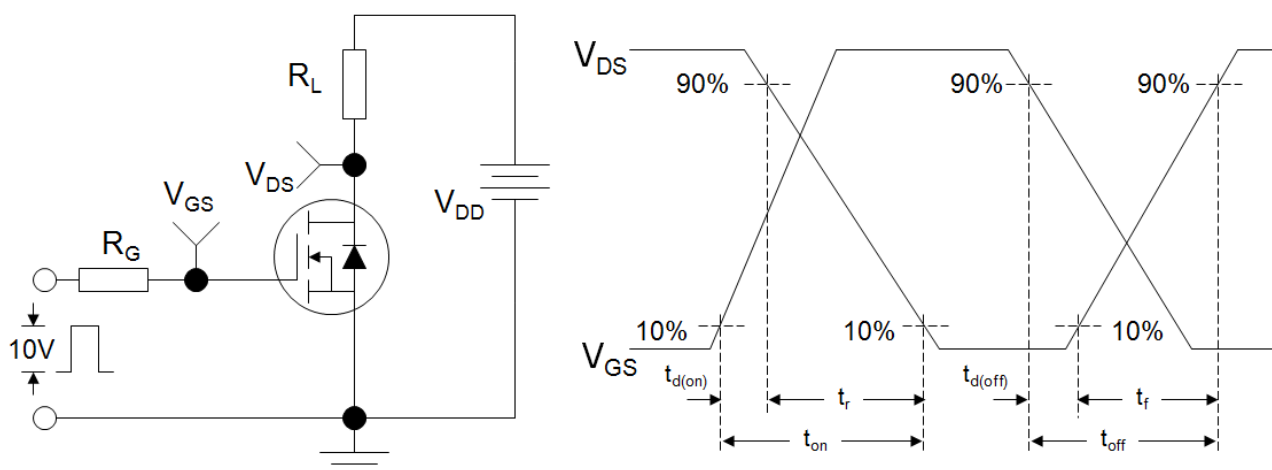
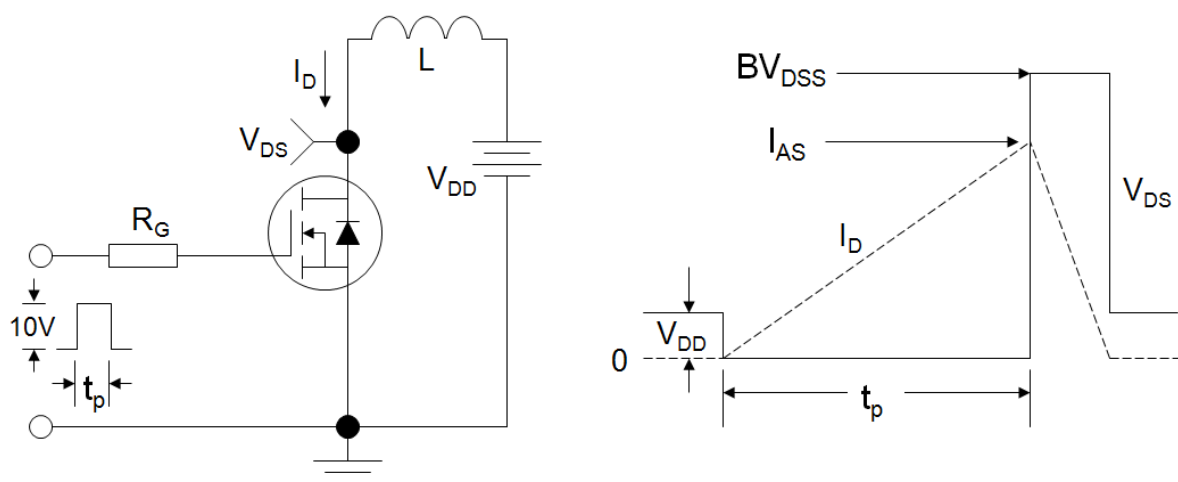
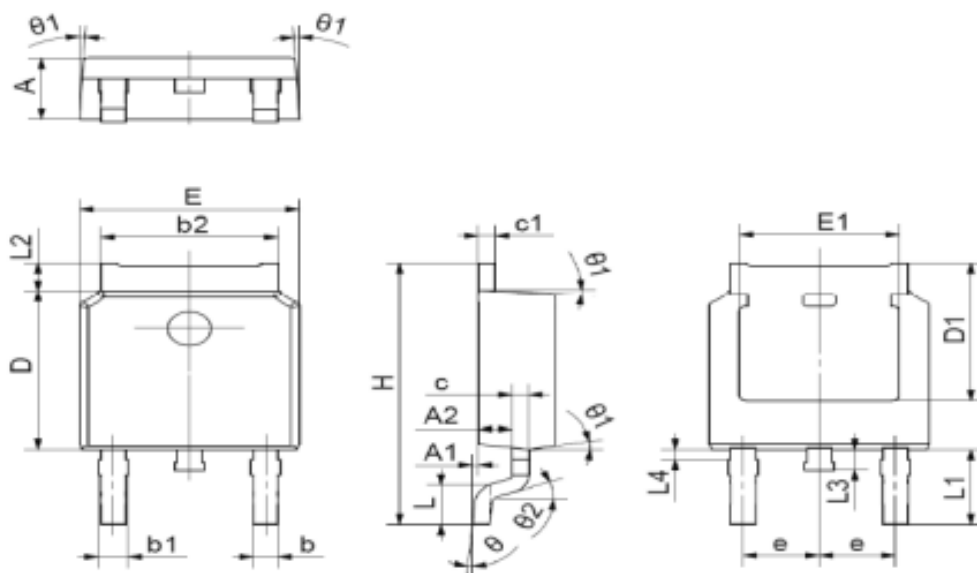


Figure C: Unclamped Inductive Switching (UIS) Test Circuit and Waveforms





TO-252(E)



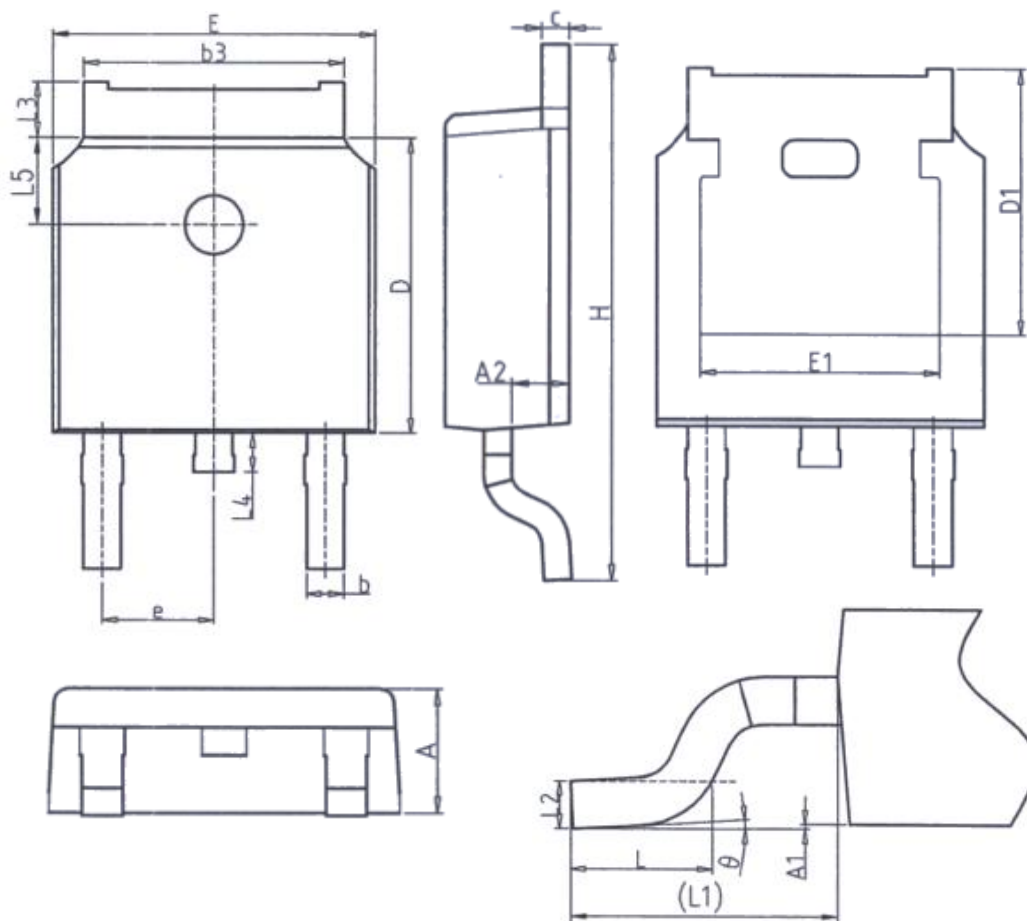
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.10	2.50	0.083	0.098
A1	0	0.15	0.000	0.006
A2	0.76	1.36	0.030	0.054
b	0.61	0.85	0.024	0.033
b1	0.71	0.91	0.028	0.036
b2	5.04	5.64	0.198	0.222
c	0.508 TYP.		0.02 TYP.	
c1	0.508 TYP.		0.02 TYP.	
D	5.8	6.3	0.228	0.248
D1	5	5.6	0.197	0.220
E	6.3	6.9	0.248	0.272
E1	4.55	5.15	0.179	0.203
e	2.286 TYP.		0.09 TYP.	
H	9.65	10.4	0.380	0.409
L	1.4	1.7	0.055	0.067
L1	2.90 REF.		0.114 REF.	
L2	0.75	1.35	0.030	0.053
L3	0.6	1.2	0.024	0.047
θ	0°	10°	0°	10°
θ1	5°	9°	5°	9°
θ2	25° REF.		25° REF.	

关键尺寸

A	A1	b	D	E	E1	e	H	D	L1
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TO-220(H)



Unit: mm			
Symbol	Min	Nom	Max
A	2.20	2.30	2.38
A1	0.00	-	0.10
A2	0.90	1.01	1.10
b	0.72	-	0.85
b3	5.13	5.33	5.46
c	0.47	-	0.60
D	6.00	6.10	6.20
D1	5.25 REF		
E	6.50	6.60	6.70
E1	4.70	-	-

Unit: mm			
Symbol	Min	Nom	Max
e	2.286BSC		
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1	2.90REF		
L2	0.508BSC		
L3	0.90	-	1.25
L4	0.60	0.80	1.00
L5	1.8 REF		
θ	0°	-	8°



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