深圳市富满电子集团股份有限公司

SHEN ZHEN FINE MADE ELECTRONICS GROUP CO., LTD.

45N10(文件编号：S&CIC1904) N-Channel Trench Power MOSFET

Description

Product Summary

- ●VDS 100V
- ●ID 45A
- ●RDS(ON)(at VGS=10V) ＜17 mohm
- ●RDS(ON)(at VGS=4.5V) ＜21.5 mohm
- ●100% UIS Tested
- ●100% ▽VDS Tested

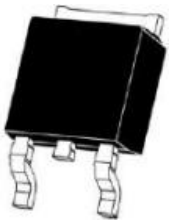
General Description

- Low RDS(on) & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

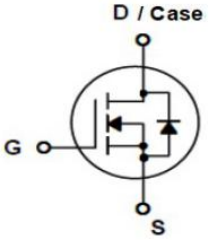
Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package



TO-252



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

Symbol	Parameter		Limit	Unit
VDS	Drain-source Voltage		100	V
VGS	Gate-source Voltage		±20	V
ID	Drain Current	TC=25℃	45	A
		TC=100℃	28.5	
IDM	Pulsed Drain Current [A]		130	A
EAS	Avalanche energy [B]		110	mJ
PD	Total Power Dissipation [C]	Tc=25℃	72	W
		Tc=100℃	28.8	
TJ ,TSTG	Junction and Storage Temperature Range		-55～+150	℃

Thermal resistance

Symbol	Parameter		Typ	Max	Units
RθJA	Thermal Resistance Junction-to-Ambient [D]	t≤10S	15	20	℃/W
	Thermal Resistance Junction-to-Ambient [D]	Steady-State	40	50	
RθJC	Thermal Resistance Junction-to-Case	Steady-State	1.35	1.7	

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Electrical Characteristics (T_j=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Static Parameter						
BV_{DSS}	Drain-Source Breakdown Voltage	VGS= 0V, ID=250μA	100			V
I_{DSS}	Zero Gate Voltage Drain Current	VDS=100,VGS=0V			1	μA
I_{GSS}	Gate-Body Leakage Current	GS= ±20V, VDS=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	VDS= VGS, ID=250μA	1	1.8	3	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	VGS= 10V, ID=20A		14	17	mΩ
		VGS= 4.5V, ID=20A		17.5	21.5	mΩ
V_{SD}	Diode Forward Voltage	IS=20A,VGS=0V			1.3	V
I_S	Maximum Body-Diode Continuous Current				45	A
R_G	Gate resistance	f= 1 MHz, Open drain		1		Ω
Dynamic Parameters						
C_{iss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V,f=1MHZ		1135		pF
C_{oss}	Output Capacitance			399		
C_{rss}	Reverse Transfer Capacitance			18		
Switching Parameters						
Q_g	Total Gate Charge	V_{GS}=10V,V_{DS}=50V,I_D=25A		16		nC
Q_{gs}	Gate-Source Charge			5.6		
Q_{gd}	Gate-Drain Charge			2.4		
Q_{rr}	Reverse Recovery Chrage	I_F=20A, di/dt=100A/us		42		
t_{rr}	Reverse Recovery Time			39.8		ns
$t_{D(on)}$	Turn-on Delay Time	V_{GS}=10V, VDD=50 ,I_D=25A RGEN=2.2Ω		39.2		
t_r	Turn-on Rise Time			11		
$t_{D(off)}$	Turn-off Delay Time			53.2		
t_f	Turn-off fall Time			15.8		

A. Repetitive rating; pulse width limited by max. junction temperature.
B. V_{DD}=20V, R_G=25Ω, L=0.5mH, I_{AS}=20A,.
C. Pd is based on max. junction temperature, using junction-case thermal resistance.
D. The value of RqJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The Power dissipation PDSM is based on R qJA t≤ 10s and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.

Typical Performance Characteristics

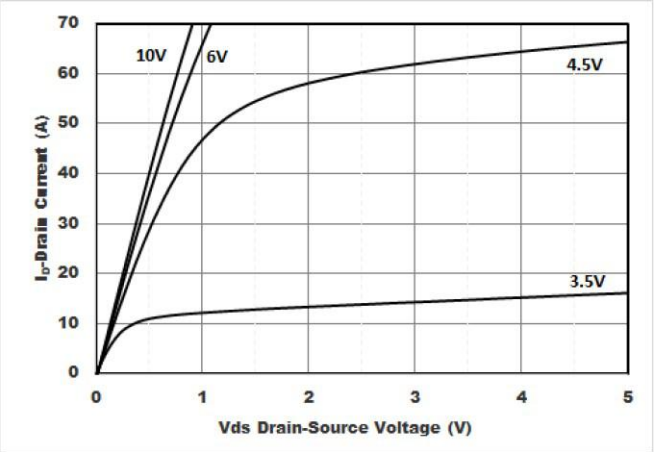

Figure1. Output Characteristics

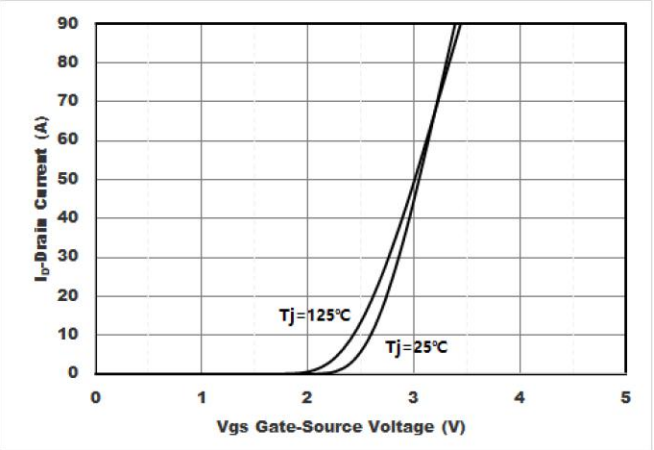

Figure2. Transfer Characteristics

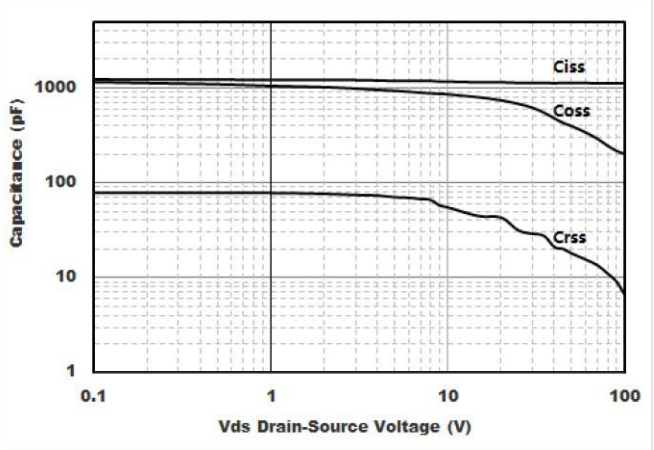

Figure3. Capacitance Characteristics

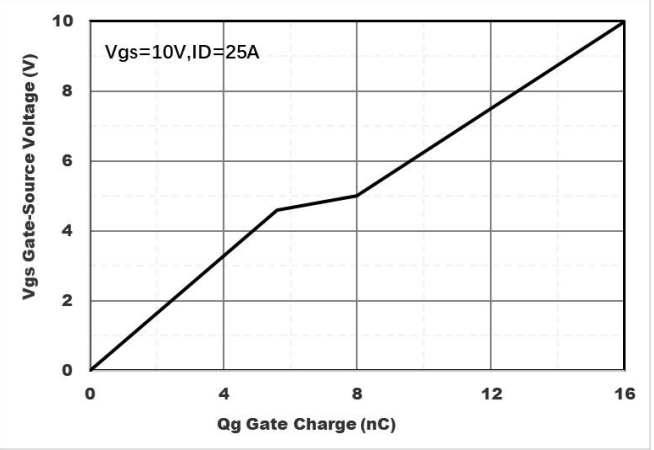

Figure4. Gate Charge

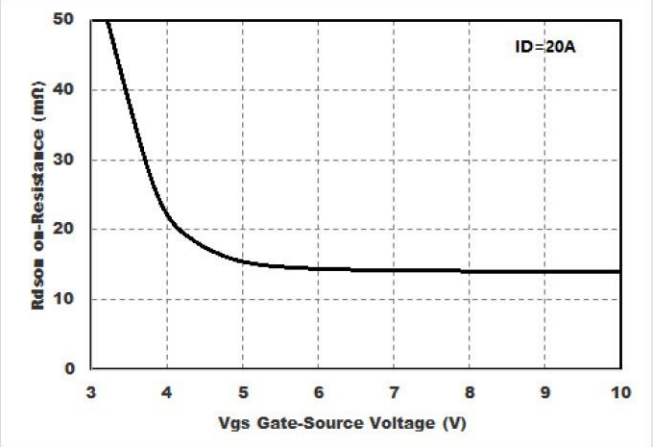

Figure5.：On-Resistance vs. Drain Current and Gate Voltage

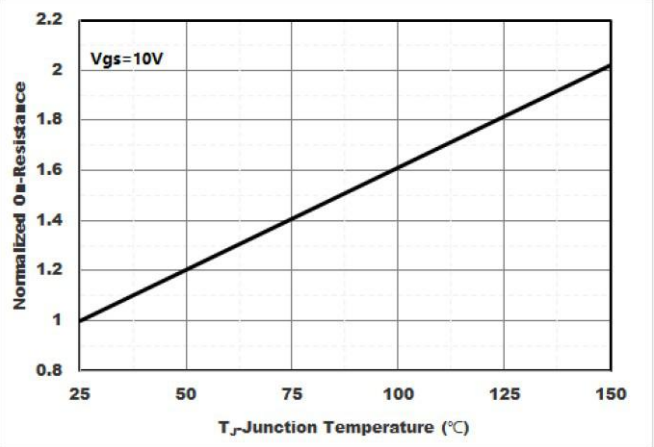

Figure6.Normalized On-Resistance

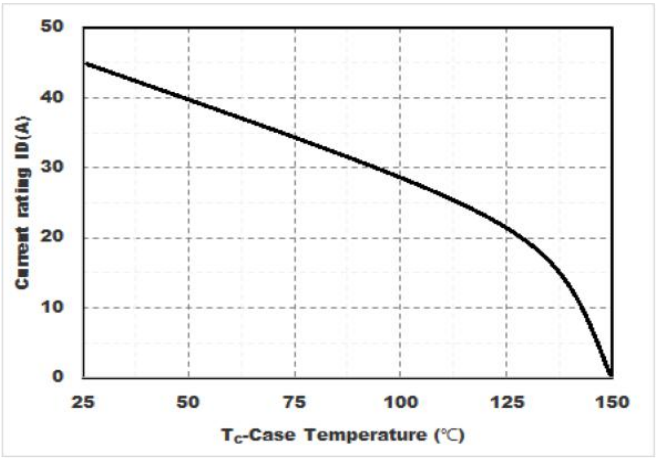

Figure7. Drain current

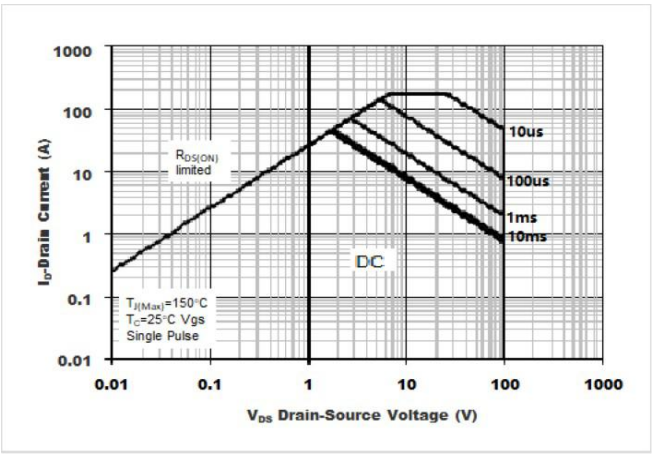

Figure8.Safe Operation Area

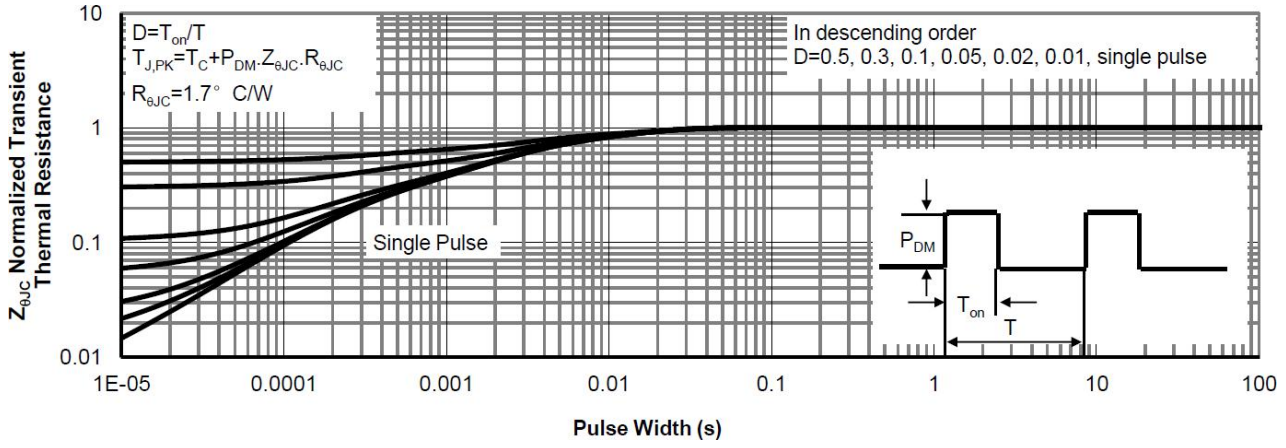

Figure9.Normalized Maximum Transient thermal impedance

Test Circuit

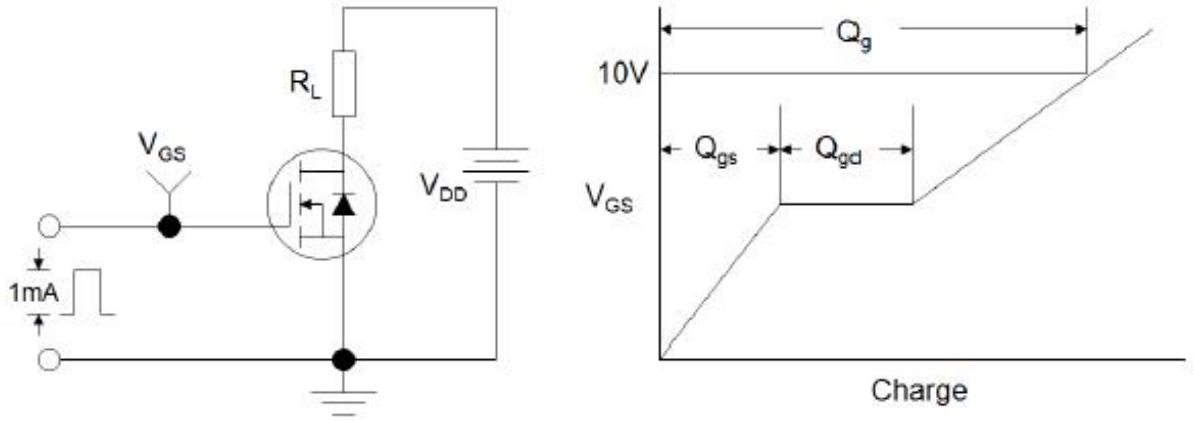

Figure1:Gate Charge Test Circuit & Waveform

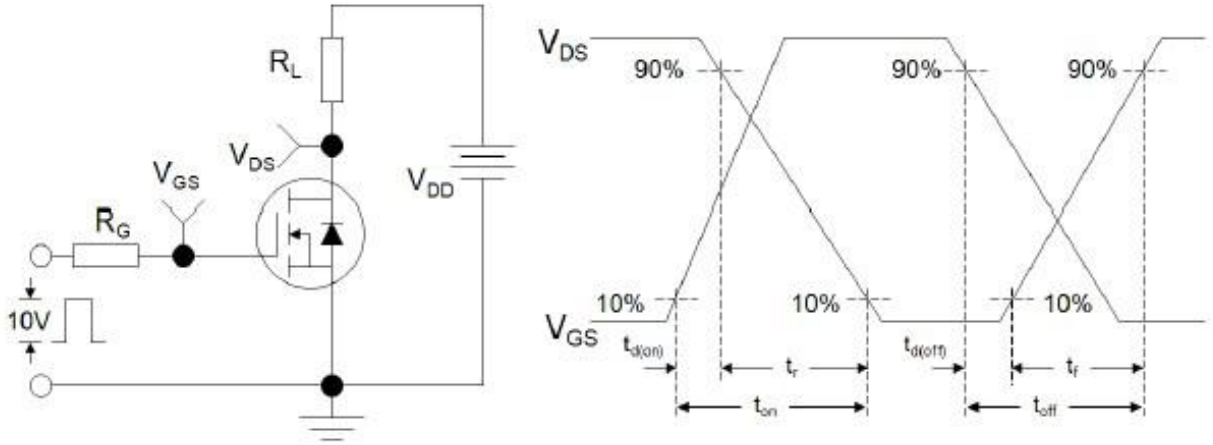

Figure 2: Resistive Switching Test Circuit & Waveforms

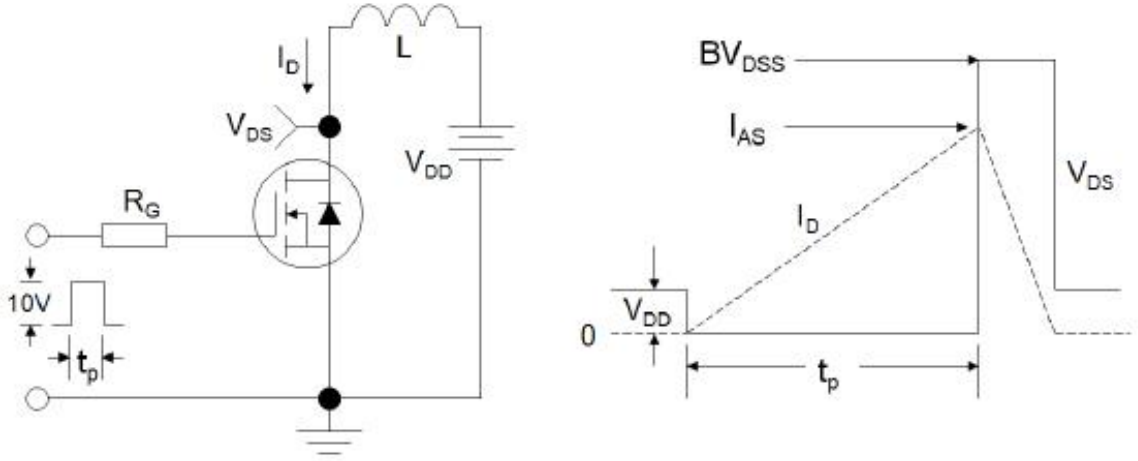

Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

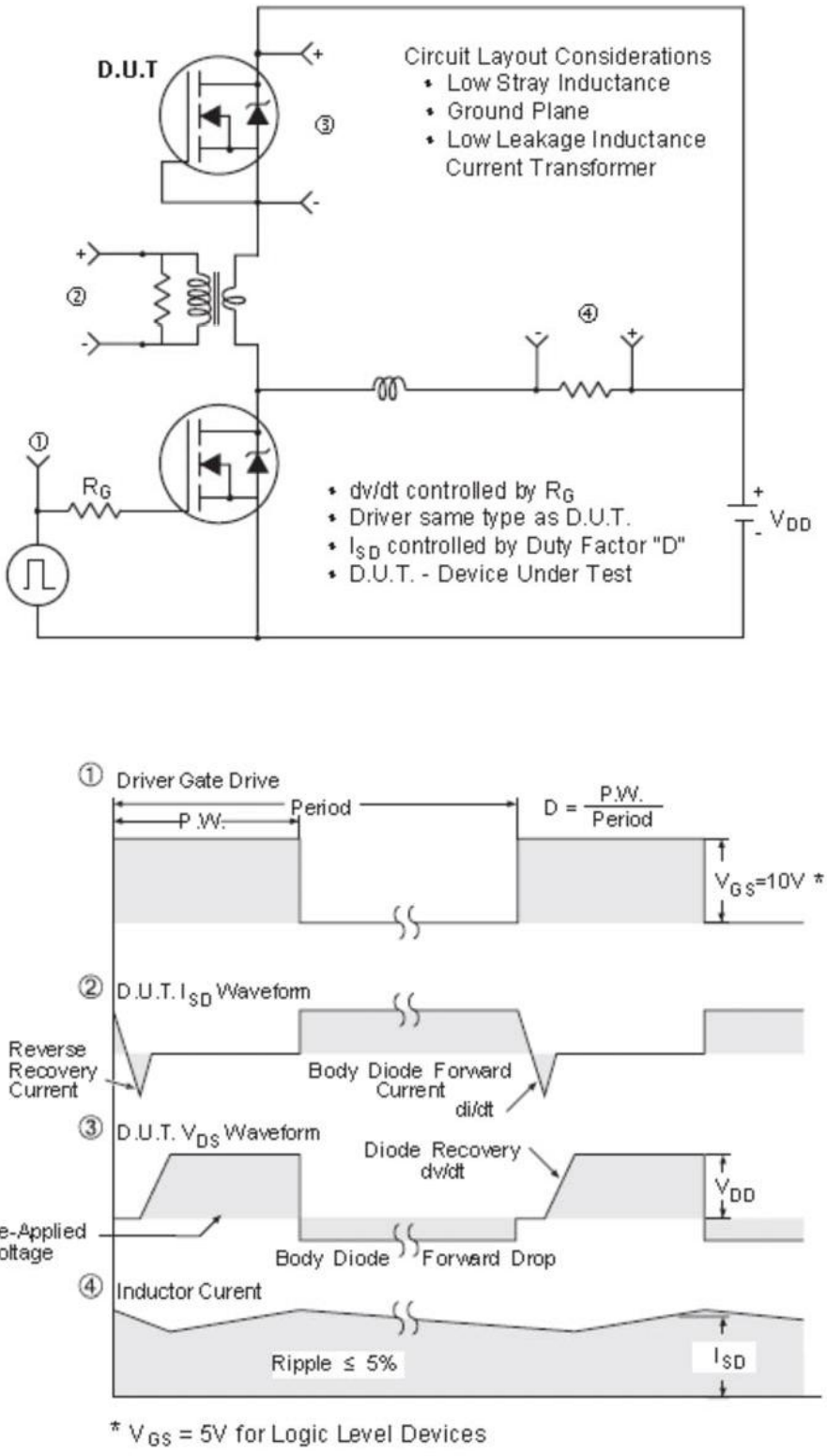

Figure 4:Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

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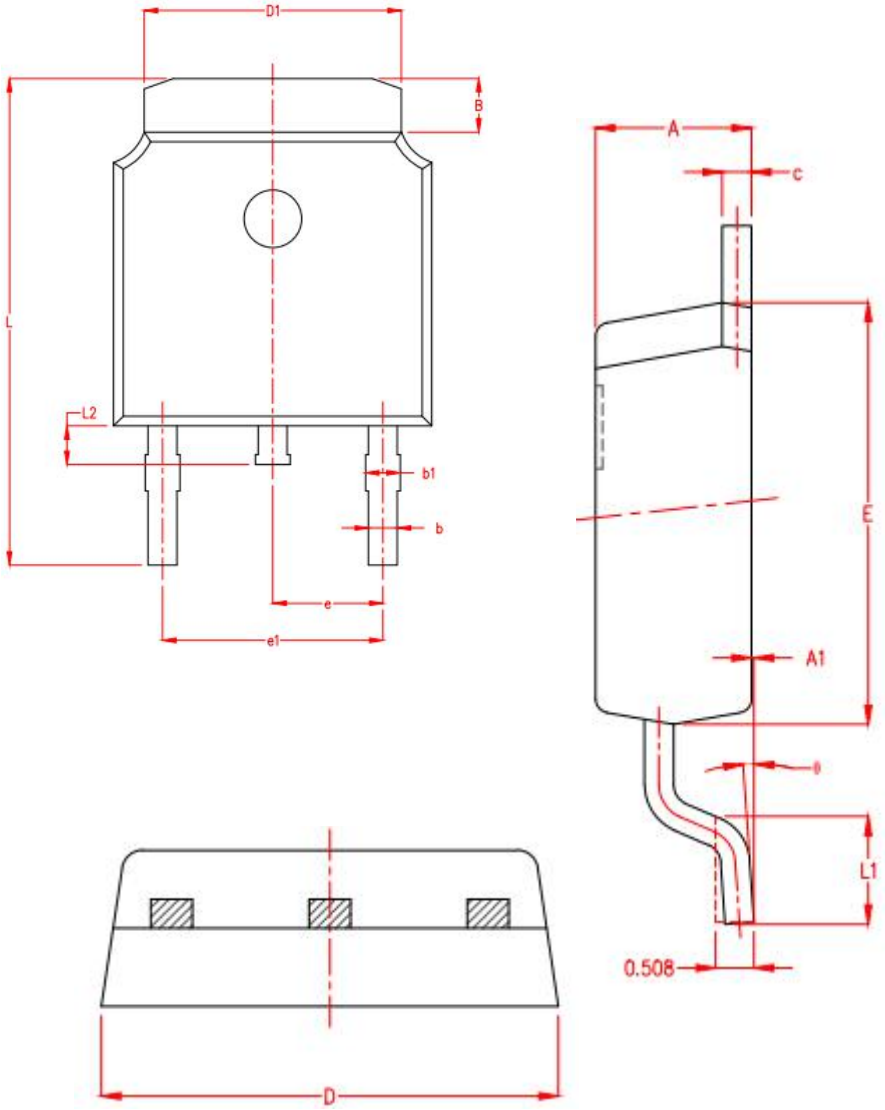
TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.15	2.25	2.35
A1	0.00	0.06	0.12
B	0.96	1.11	1.26
b	0.59	0.69	0.79
b1	0.69	0.81	0.93
c	0.34	0.42	0.50
D	6.45	6.60	6.75
D1	5.23	5.33	5.43
E	5.95	6.10	6.25
e	2.286TYP.		
e1	4.47	4.57	4.67
L	9.90	10.10	10.30
L1	1.40	1.55	1.70
L2	0.60	0.80	1.00
θ	0°	4°	8°