GPJ70R380TF

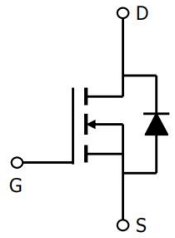
700V N-Channel MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
700V	380mΩ@10V	11A

TO-252-2L

Schematic diagram



Feature

- Super-Junction MOSFET
- High Ruggedness
- Low RDS(ON)
- 100% Avalanche Tested
- Improved dv/dt Capability

Application

- High-frequency Switching
- Power Factor Correction
- Uninterruptible Power Supply

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPJ70R380TF	TO-252-2L	J75R380	Tape&Reel	330mm	16mm	2500pcs

ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	700	V
Gate - Source Voltage		V_{GS}	±30	V
Continuous Drain Current[1]	T_C = 25℃	I_D	11	A
	T_C = 100℃	I_D	6.6	A
Pulsed Drain Current[2]		I_{DM}	33	A
Single Pulsed Avalanche Energy[3]		E_{AS}	135	mJ
Power Dissipation	T_C = 25℃	P_D	134	W
MOSFET dv/dt Ruggedness(V_{DS}=0~480V)		dv/dt	50	V/ns
Peak Diode Recovery dv/dt(V_{DS}=0~400V, I_{SD}≤I_D)		dv/dt	15	V/ns
Thermal Resistance, Junction to Case		R_{thjc}	0.93	℃/W
Thermal Resistance, Junction to Ambient		R_{thja}	104.8	℃/W
Junction Temperature		T_J	-55~ +150	℃
Storage Temperature		T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	700			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 700V, V_{GS} = 0V			1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.5	3.5	4.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 5A		320	380	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 50V, V_{GS} = 0V, f = 1MHz		571		pF
Output Capacitance	C_{oss}			45		
Reverse Transfer Capacitance	C_{rss}			5.46		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		21		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} =400V, V_{GS} = 10V, I_D = 5.5A		17.5		nC
Gate-Source Charge	Q_{gs}			4.6		
Gate-Drain Charge	Q_{gd}			8.4		
Turn-On Delay Time	$t_{d(on)}$	V_{DS} =400V, V_{GS} = 10V, I_D = 5.5A,R_G = 25Ω		26		ns
Turn-On Rise Time	t_r			44		
Turn-Off Delay Time	$t_{d(off)}$			65		
Turn-Off Fall Time	t_f			24		
Source - Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 11A		0.9	1.3	V
Diode Continuous Forward Current	I_S	Integral reverse p-n Junction diode in the MOSFET			11	A
Body Diode Reverse Recovery Time	t_{rr}	I_S=5.5A, dI/dt = 100 A/μs,V_{GS} = 0V		238		ns
Body Diode Reverse Recovery Charge	Q_{rr}			2310		nC

Notes :

1. Drain current is limited by maximum junction temperature.
2. Repetitive rating : pulse width limited by junction temperature.
3. L = 40mH, I_{AS} = 4.5A, V_{DD} = 100V, R_G=25Ω, Starting at T_J = 25℃.

Typical Characteristics

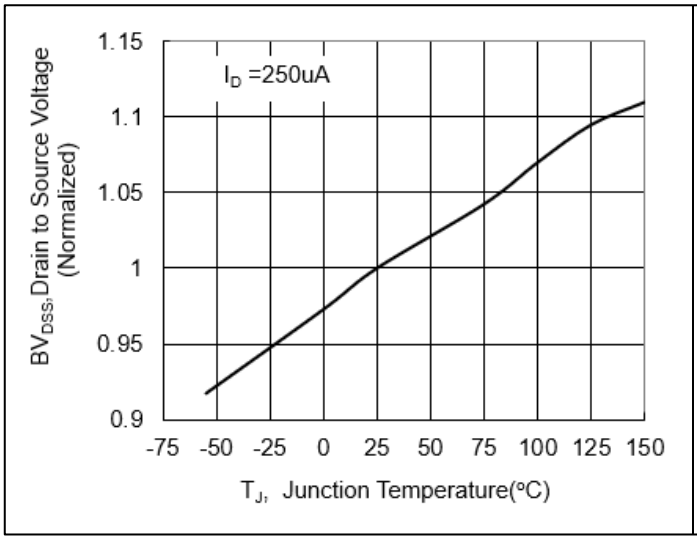


Fig1. BV_{DSS} vs Junction Temperature

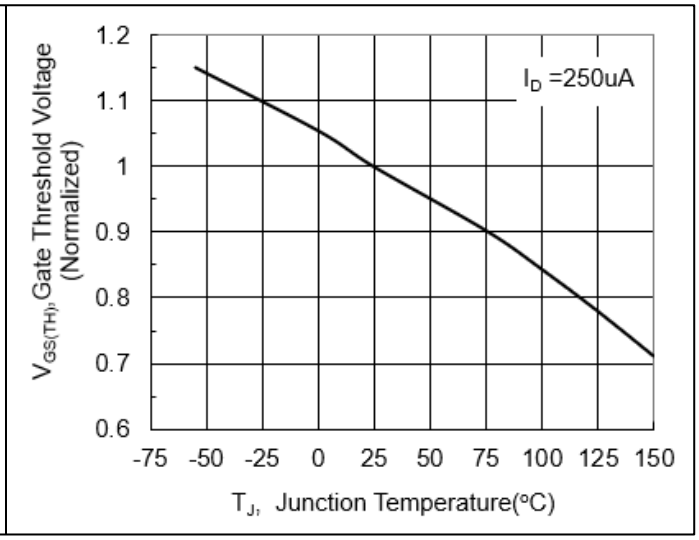


Fig2. $V_{GS(TH)}$ vs Junction Temperature

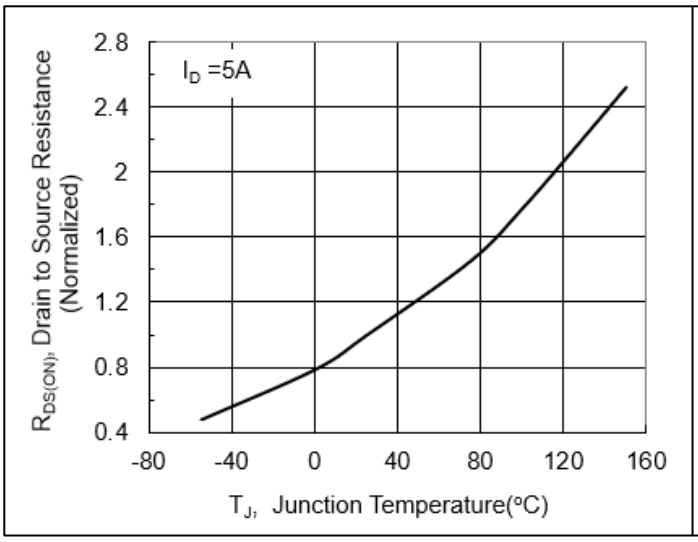


Fig3. $R_{DS(ON)}$ vs Junction Temperature

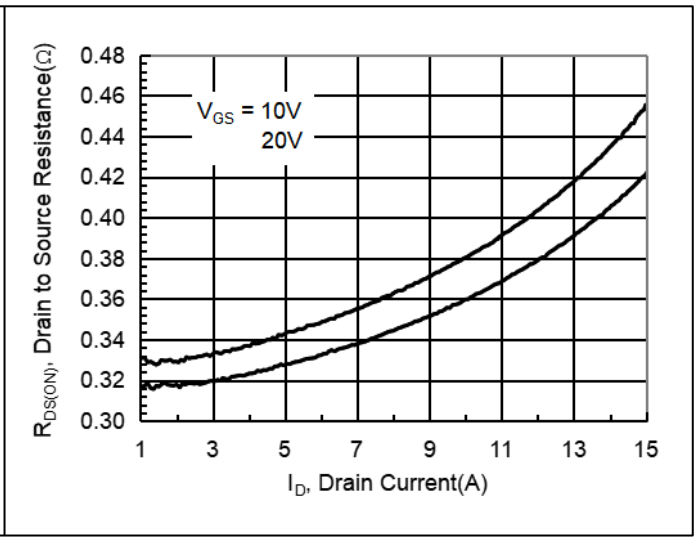


Fig4. Drain-source on-state resistance

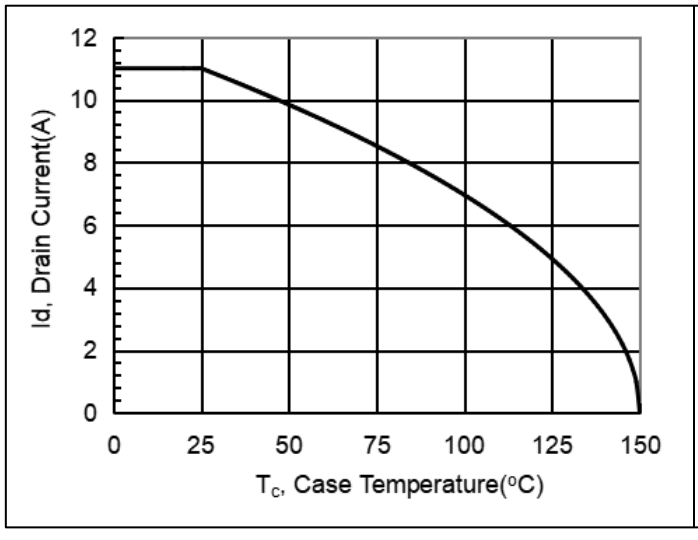


Fig 5. Drain current

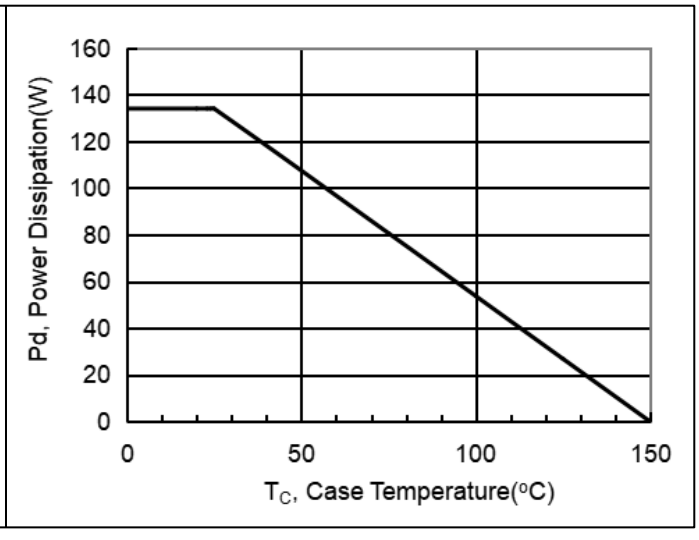


Fig 6. Power dissipation

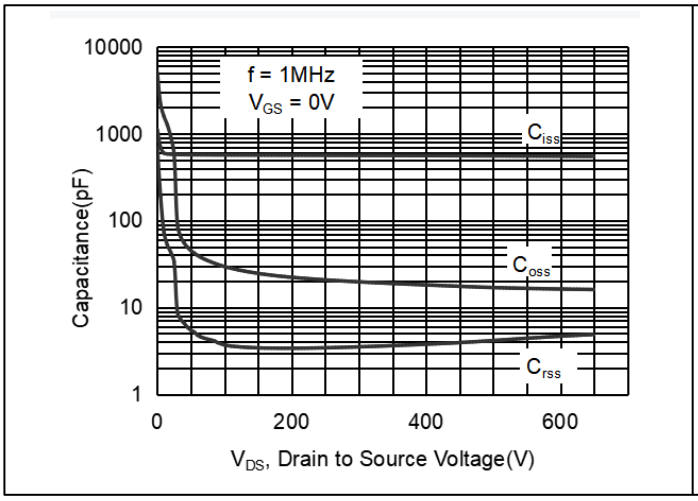


Fig 7. Capacitance Characteristics

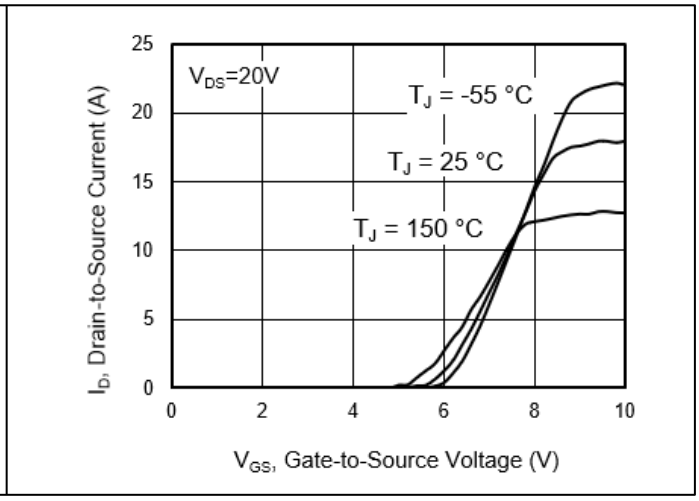


Fig 8 . Transfer characteristics

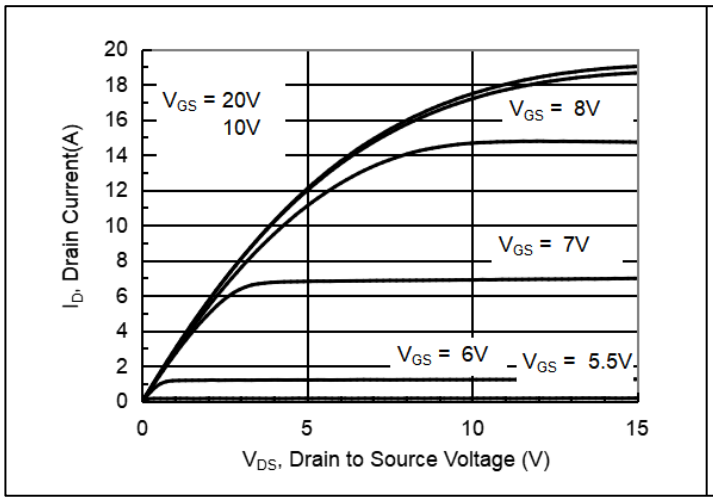


Fig9. Output characteristics（Tj=25 °C）

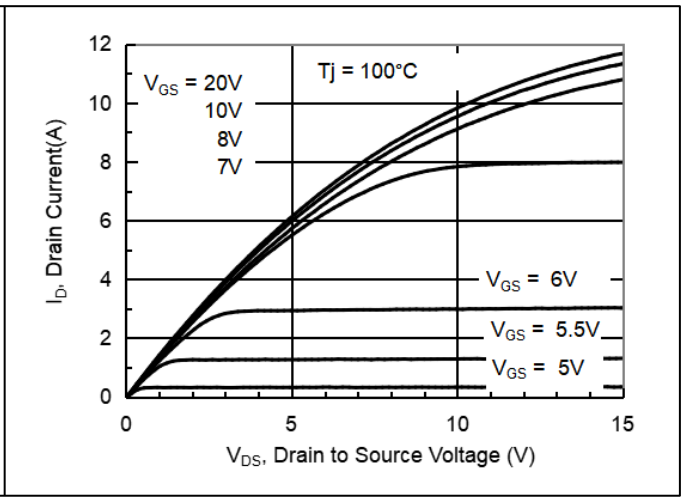


Fig10. Output characteristics（Tj=100 °C）

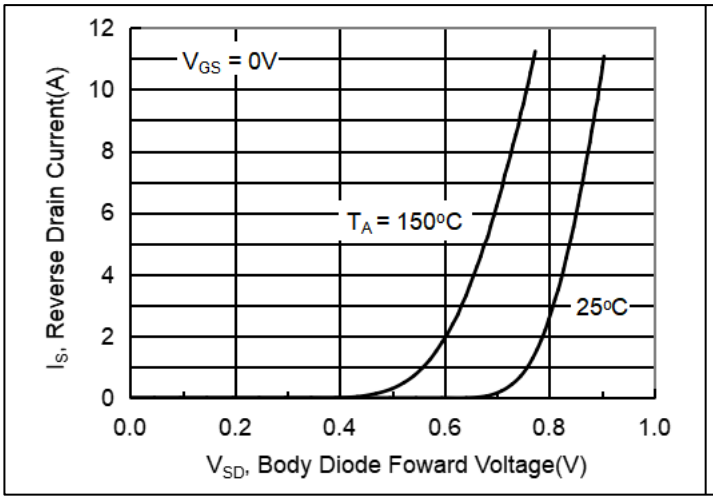


Fig 11 . Forward characteristics of reverse diode

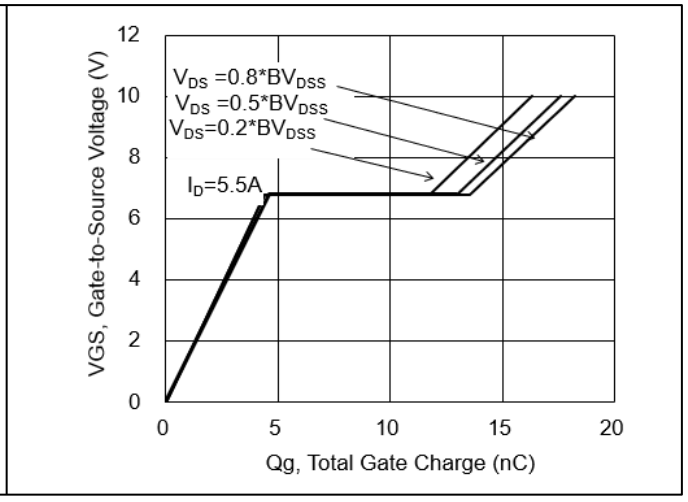
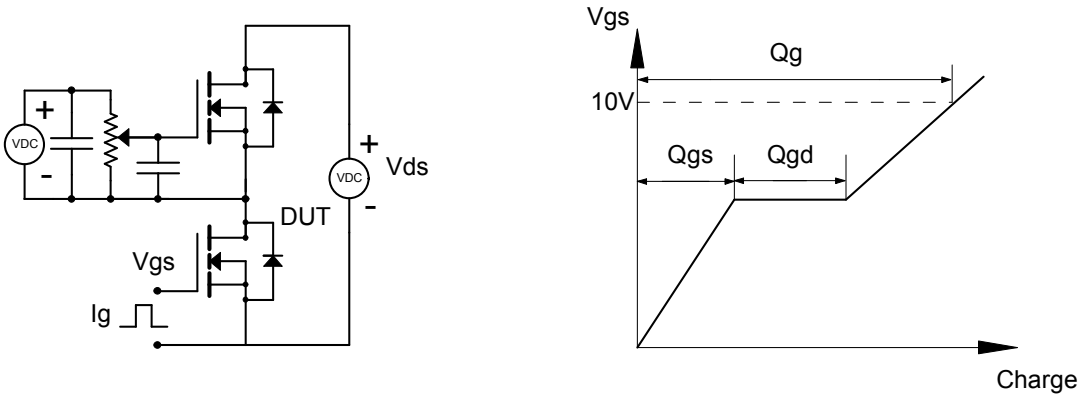


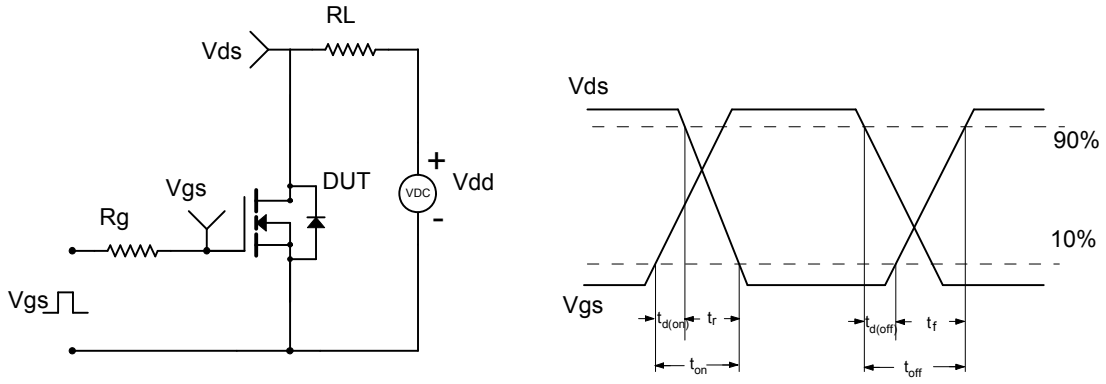
Fig12. Gate charge characteristics

Test Circuit

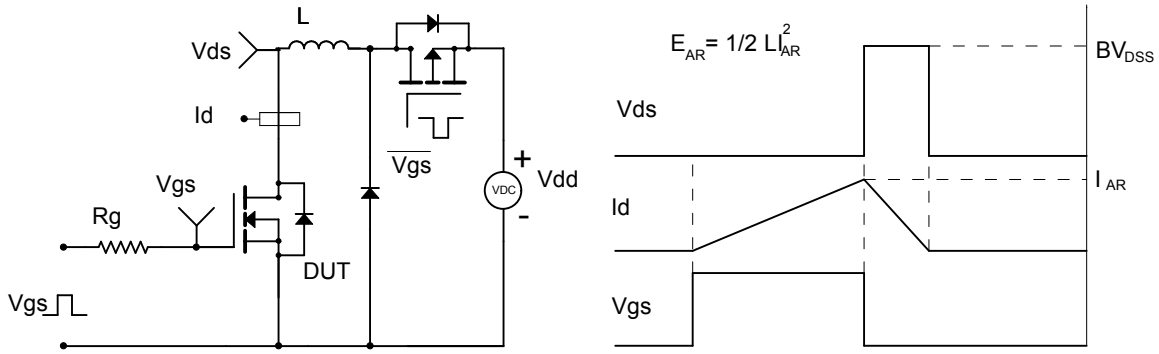
Gate Charge Test Circuit & Waveform



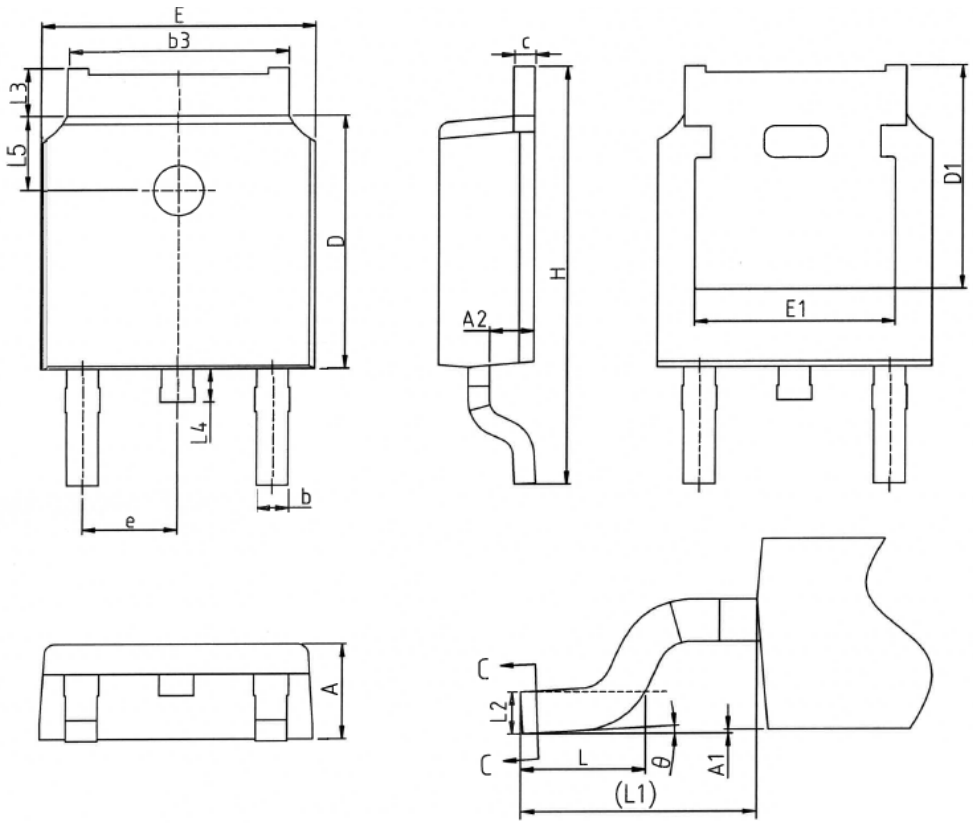
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



TO-252-2L Package Information



NOTES
1.ALL DIMENSIONS REFER TO JEDEC STANDARD TO-252 AA, DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0.00	-	0.12
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.46
c	0.43	0.53	0.61
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.73
E1	4.63	-	-
e	2.286BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88	-	1.28
L4	0.50	-	1.00
L5	1.65	1.80	1.95
θ	0°	-	8°

Attention：

- GreenPower Electronics reserves the right to improve product design function and reliability without notice.
- Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.
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