GPJ70R580TF

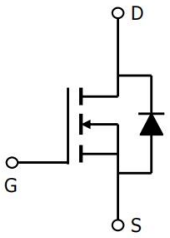
700V N-Channel MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
700V	580mΩ@10V	8A

TO-252-2L

Schematic diagram



Feature

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

Application

- Charger
- PC Power
- LED Lighting

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPJ70R580TF	TO-252-2L	J75R580	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	8	A
	T_C = 100℃	I_D	5	A
Pulsed Drain Current[1]		I_{DM}	24	A
Single Pulsed Avalanche Energy[3]		E_{AS}	120	mJ
Repetitive Avalanche Energy[2]		E_{AR}	10	mJ
Power Dissipation	T_C = 25℃	P_D	104	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}	1.2	℃/W
Thermal Resistance, Junction to Ambient		R_{thja}	62	℃/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
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta TJ$	I_D=250uA, referenced to 25℃		0.56		V/℃
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 700V, V_{GS} = 0V			1	μA
		V_{DS} = 560V, T_J=125℃			50	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	2.8	3.3	3.8	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 4A		500	580	mΩ
Forward Transconductance	G_{fs}	V_{GS} = 30V, I_D = 4.5A		7		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 200V, V_{GS} = 0V, f = 1MHz		510		pF
Output Capacitance	C_{oss}			25		
Reverse Transfer Capacitance	C_{rss}			1.6		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		19		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} =560V, V_{GS} = 10V, I_D = 8A		15.6		nC
Gate-Source Charge	Q_{gs}			4.95		
Gate-Drain Charge	Q_{gd}			5.52		
Turn-On Delay Time	$t_{d(on)}$	V_{DS} =350V, V_{GS} = 10V, I_D = 8A,R_G = 10Ω		12		ns
Turn-On Rise Time	t_r			24		
Turn-Off Delay Time	$t_{d(off)}$			30		
Turn-Off Fall Time	t_f			25		
Source - Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 8A			1.4	V
Diode Continuous Forward Current	I_S	Integral reverse p-n Junction diode in the MOSFET			8	A
Body Diode Reverse Recovery Time	t_{rr}	I_S=8A, dI/dt = 100 A/μs,V_{GS} = 0V		235		ns
Body Diode Reverse Recovery Charge	Q_{rr}			1.85		μC

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

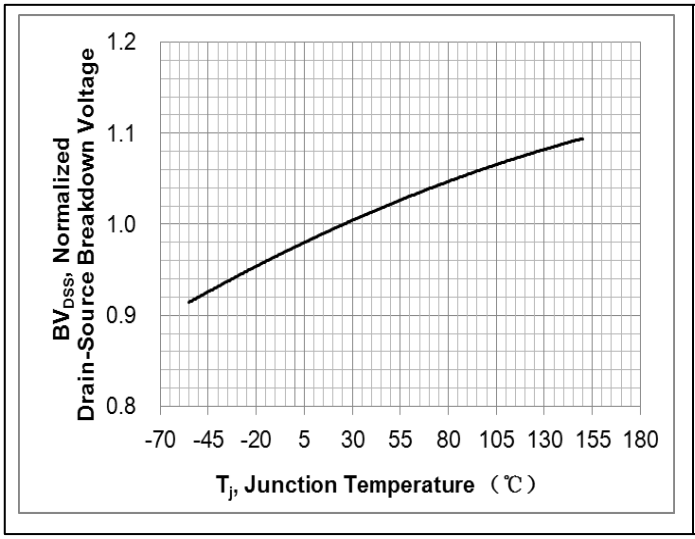


Fig1. BV_{DSS} vs Junction Temperature

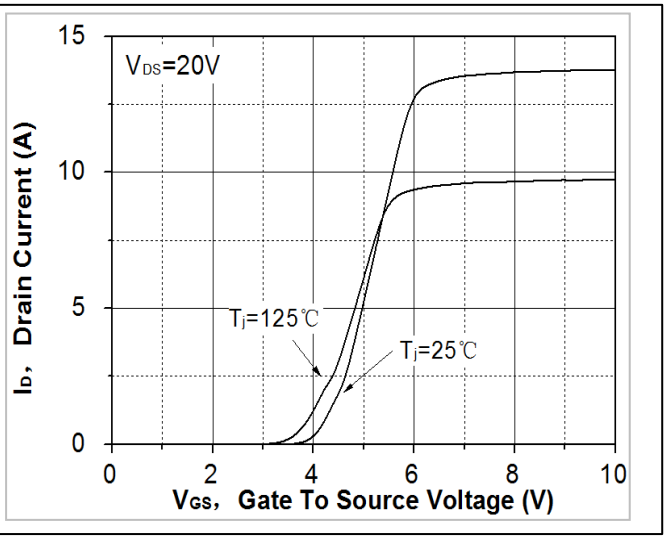


Fig 2. Transfer characteristics

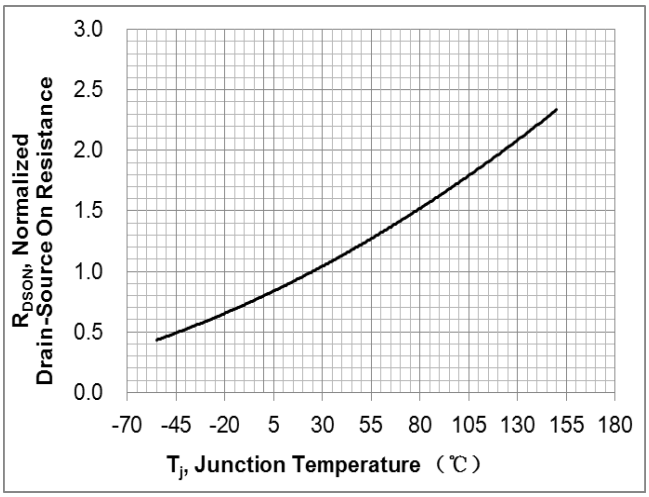


Fig 3. $R_{DS(ON)}$ vs Junction Temperature

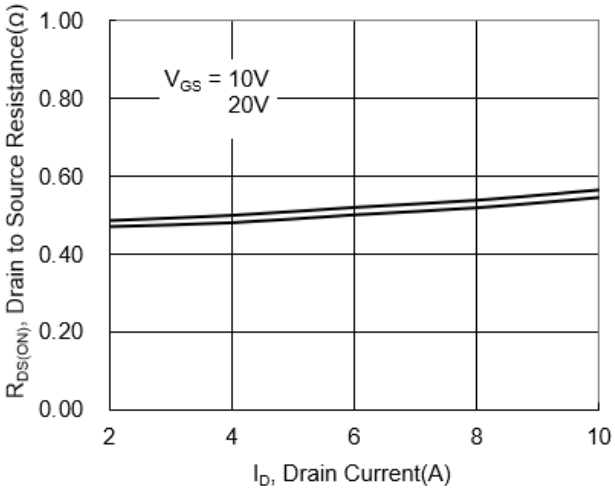


Fig 4. Drain-source on-state resistance

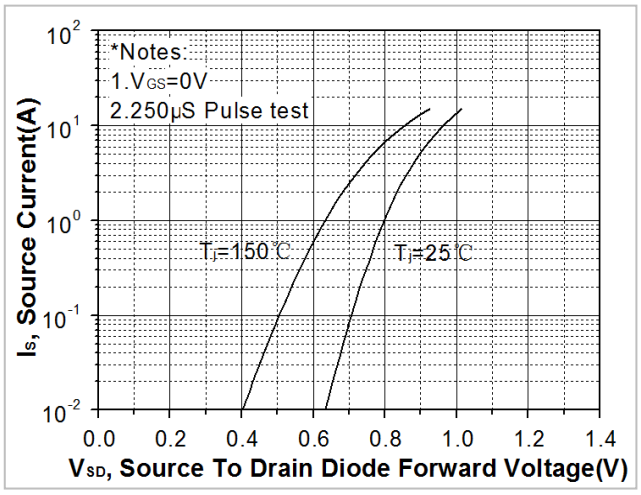


Fig 5 . Forward characteristics of reverse diode

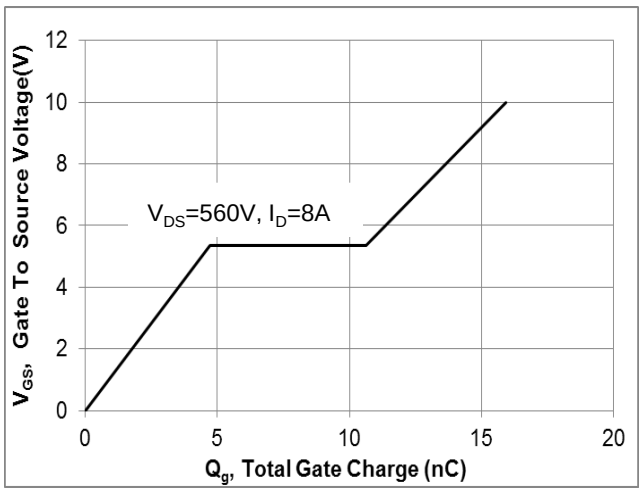


Fig 6. Gate charge characteristics

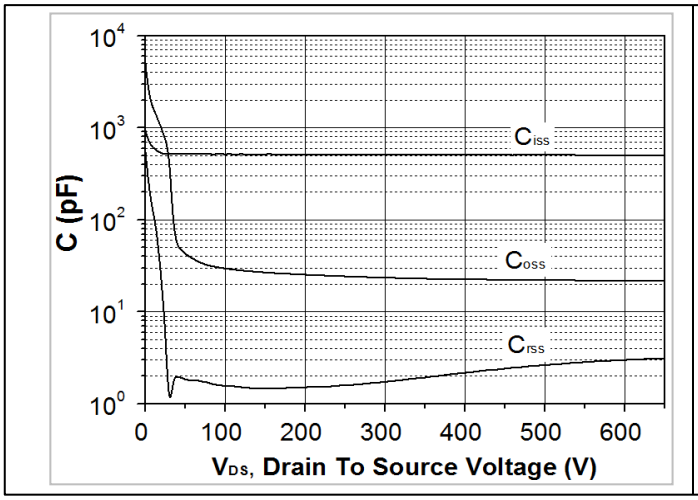


Fig 7. Capacitance Characteristics

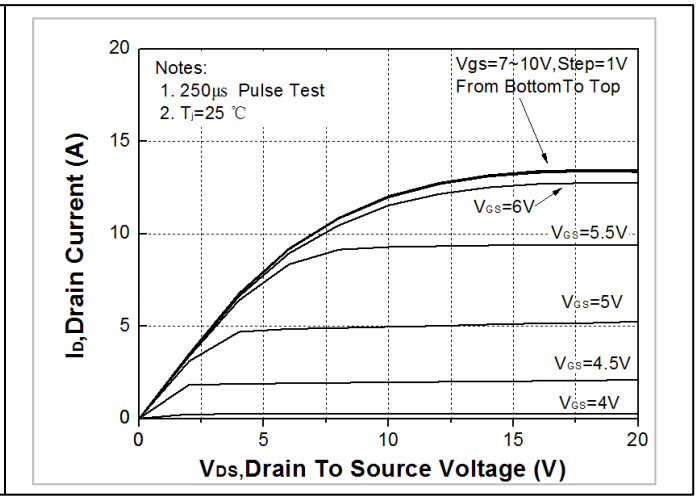


Fig 8. Output characteristics (Tj=25 °C)

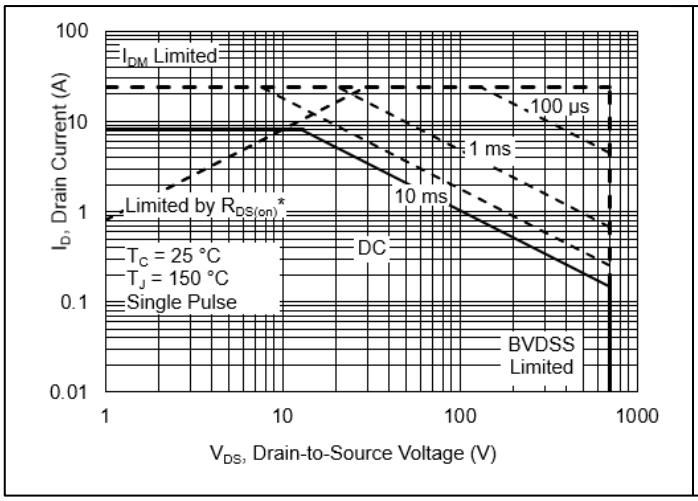


Fig 9. Safe operating area(TO-252)

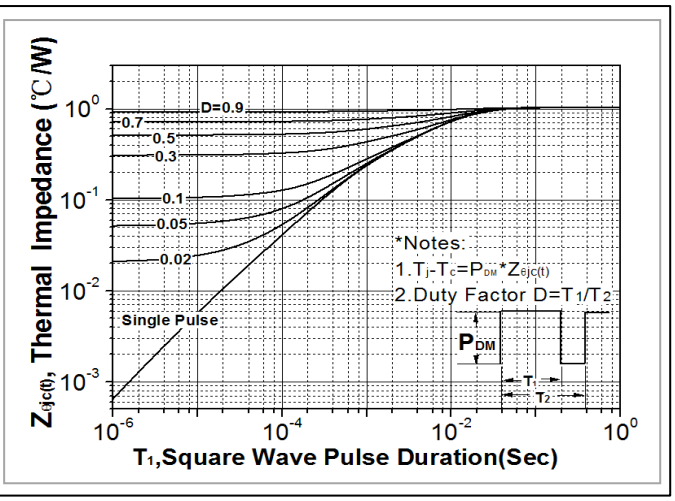
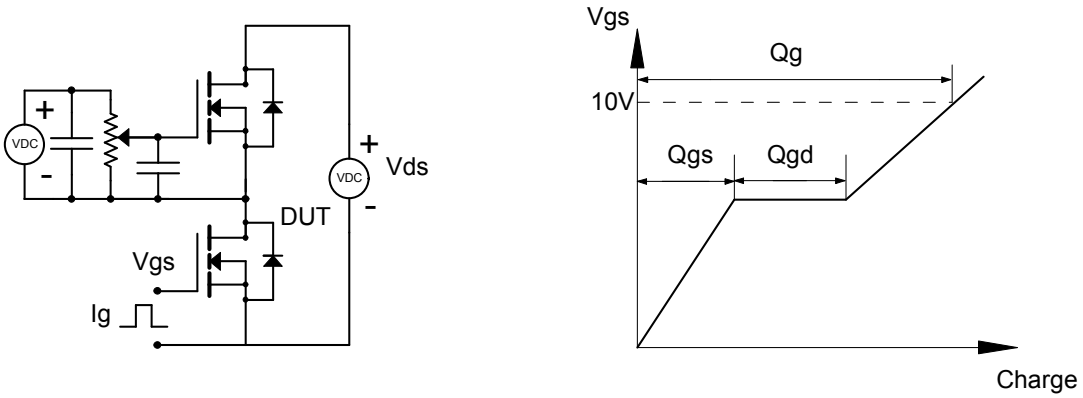


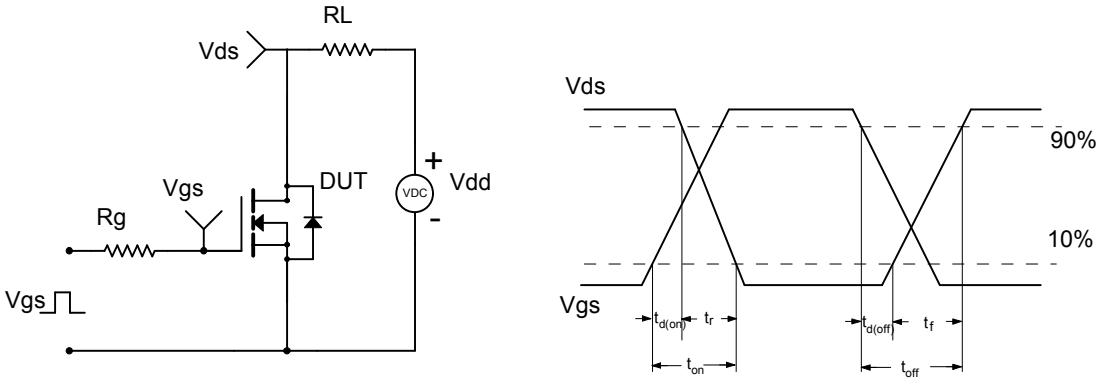
Fig 10. Transient thermal impedance (TO-252)

Test Circuit

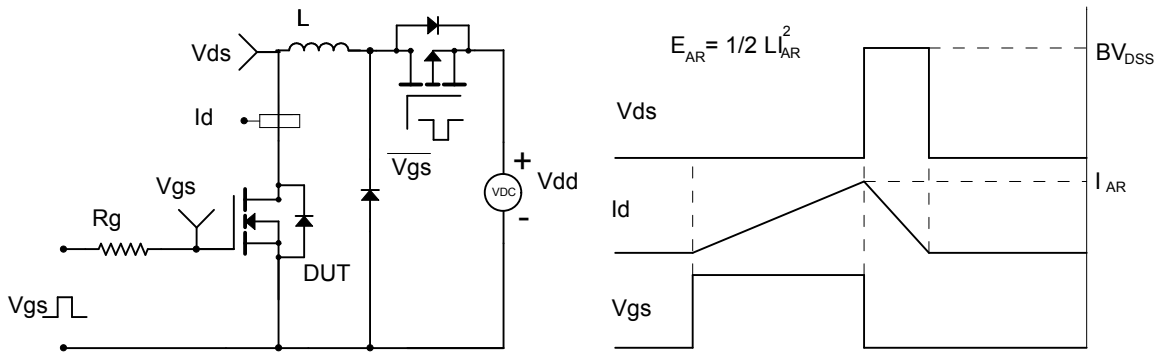
Gate Charge Test Circuit & Waveform



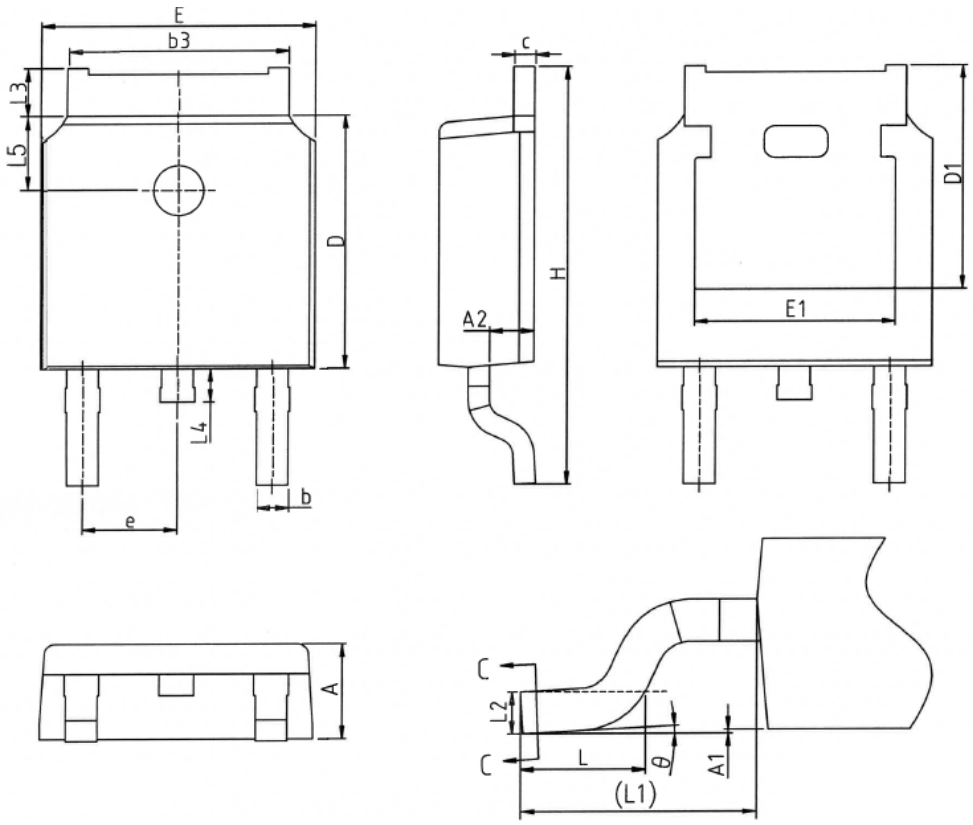
Resistive Switching Test Circuit & Waveform



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°

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