

P-Channel Enhancement Mode Power MOSFET

Description

The PT FÍ ÚÍ Í S uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

General Features

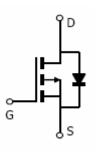
- V_{DS} =-55V, I_{D} =-15A $R_{DS(ON)}$ <75m Ω @ V_{GS} =-10V
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

Application

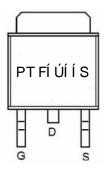
- Power switching application
- Hard switched and high frequency circuits
- DC-DC Converter

100% UIS TESTED!

100% ΔVds TESTED!



Schematic diagram



Marking and pin assignment



TO-252-2L top view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
ÁRT FÍ ÚÍ Í S	ÁAPTFÍÚÍÍS	TO-252-2L	-	-	-

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	-55	V
Gate-Source Voltage	V _G s	±20	V
Drain Current-Continuous	I _D	-15	А
Drain Current-Continuous(T _C =100℃)	I _D (100℃)	-10	Α
Pulsed Drain Current	I _{DM}	-50	Α
Maximum Power Dissipation	P _D	50	W
Operating Junction and Storage Temperature Range	T_{J} , T_{STG}	-55 To 150	°C

Thermal Characteristic

Thermal Resistance ,Junction-to-Case ^(Note 2)	$R_{ heta JC}$	2.5	°C/W



Electrical Characteristics (T_C=25 °C unless otherwise noted)

Parameter	Symbol	Condition	Min	Тур	Max	Unit
Off Characteristics	<u>. </u>					
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250μA	V _{GS} =0V I _D =-250μA -55		-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-55V,V _{GS} =0V	-	-	1	μΑ
Gate-Body Leakage Current	I _{GSS}	V_{GS} =±20 V , V_{DS} =0 V	-	-	±100	nA
On Characteristics (Note 3)	<u> </u>		•			
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250μA	-1.5	-2.6	-3.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-5A	-	60	75	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-15V,I _D =-5A	16	-	-	S
Dynamic Characteristics (Note4)	,		1			
Input Capacitance	C _{lss}	\/ 00\/\/ 0\/	-	1450	-	PF
Output Capacitance	Coss	V_{DS} =-20V, V_{GS} =0V, F=1.0MHz	-	145	-	PF
Reverse Transfer Capacitance	C _{rss}	F=1.UIVIFIZ	-	110	-	PF
Switching Characteristics (Note 4)	<u>. </u>					
Turn-on Delay Time	t _{d(on)}		-	8	-	nS
Turn-on Rise Time	t _r	V_{DD} =-30 V , , R_L =30 Ω	-	9	-	nS
Turn-Off Delay Time	t _{d(off)}	V_{GS} =-10 V , R_{GEN} =6 Ω	-	65	-	nS
Turn-Off Fall Time	t _f		-	30	-	nS
Total Gate Charge	Qg	\/ - 20\/ - 54	-	26	-	nC
Gate-Source Charge	Q _{gs}	V_{DS} =-30V, I_{D} =-5A, V_{GS} =-10V	-	4.5	-	nC
Gate-Drain Charge	Q _{gd}	v GS10 v	-	7	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V,I _S =-3A	-	-	1.2	V
Diode Forward Current (Note 2)	Is		-	-	-15	Α

Notes:

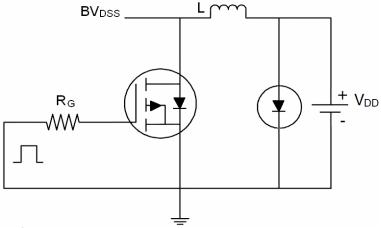
- 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
- **2.** Surface Mounted on FR4 Board, $t \le 10$ sec.
- 3. Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.
- 4. Guaranteed by design, not subject to production

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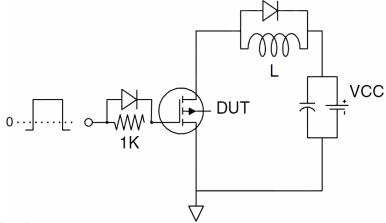


Test Circuit

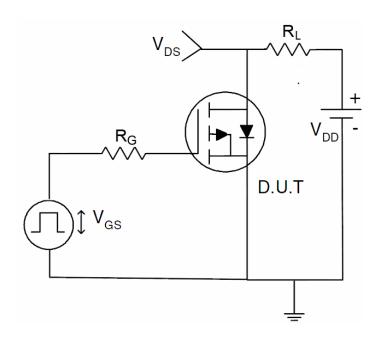
1) E_{AS} Test Circuit



2) Gate Charge Test Circuit



3) Switch Time Test Circuit





Typical Electrical and Thermal Characteristics (Curves)

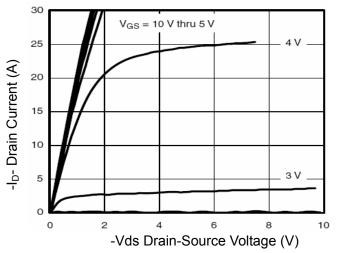


Figure 1 Output Characteristics

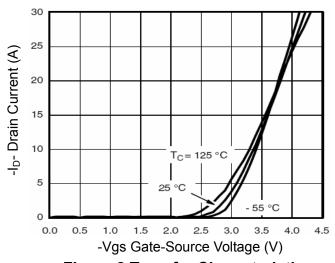


Figure 2 Transfer Characteristics

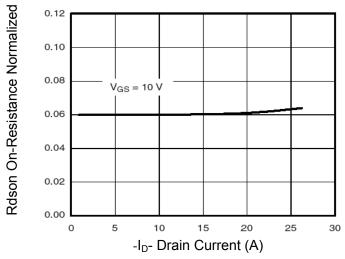


Figure 3 Rdson- Drain Current

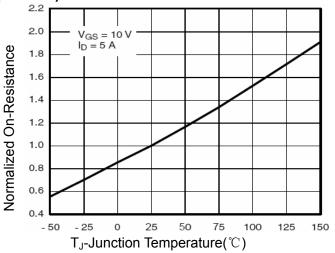


Figure 4 Rdson-Junction Temperature

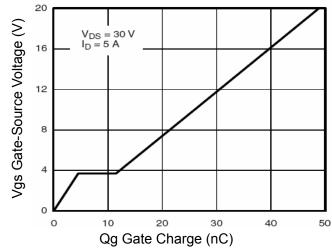


Figure 5 Gate Charge

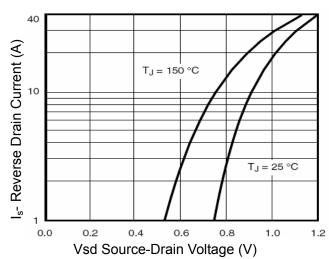


Figure 6 Source- Drain Diode Forward



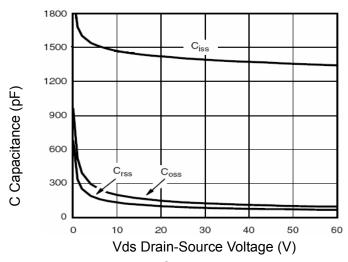


Figure 7 Capacitance vs Vds

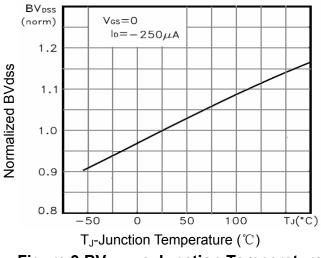


Figure 9 BV_{DSS} vs Junction Temperature

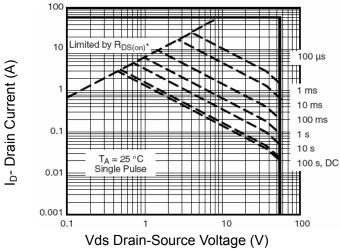


Figure 8 Safe Operation Area

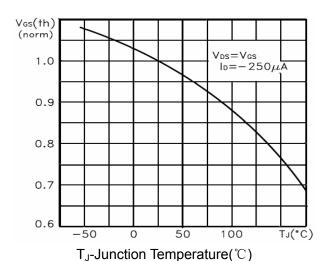


Figure 10 V_{GS(th)} vs Junction Temperature

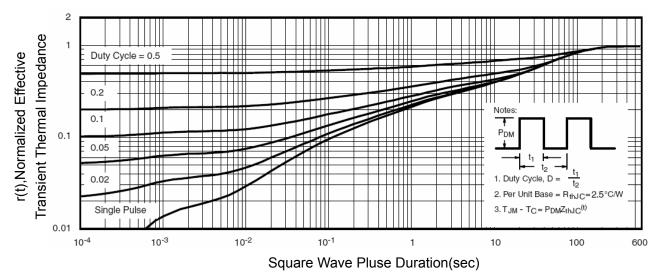
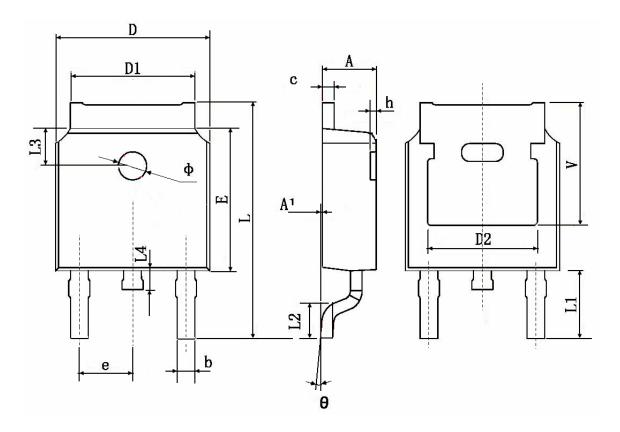


Figure 11 Normalized Maximum Transient Thermal Impedance



TO-252 Package Information



Symbol	Dimensions	In Millimeters	Dimensions In Inches		
Symbol	Min.	Max.	Min.	Max.	
А	2.200	2.400	0.087	0.094	
A1	0.000	0.127	0.000	0.005	
b	0.660	0.860	0.026	0.034	
С	0.460	0.580	0.018	0.023	
D	6.500	6.700	0.256	0.264	
D1	5.100	5.460	0.201	0.215	
D2	0.483	TYP.	0.190 TYP.		
E	6.000	6.200	0.236	0.244	
е	2.186	2.386	0.086	0.094	
L	9.800	10.400	0.386	0.409	
L1	2.900 TYP.		0.114 TYP.		
L2	1.400	1.700	0.055	0.067	
L3	1.600	1.600 TYP.		TYP.	
L4	0.600	1.000	0.024	0.039	
Ф	1.100	1.300	0.043	0.051	
θ	0°	8°	0°	8°	
h	0.000	0.300	0.000	0.012	
V	5.350 TYP. 0.211 TYP.			TYP.	



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