



**THE DATASHEET OF  
PJT7812\_R1\_00001**





# PJT7812

## 30V N-Channel Enhancement Mode MOSFET – ESD Protected

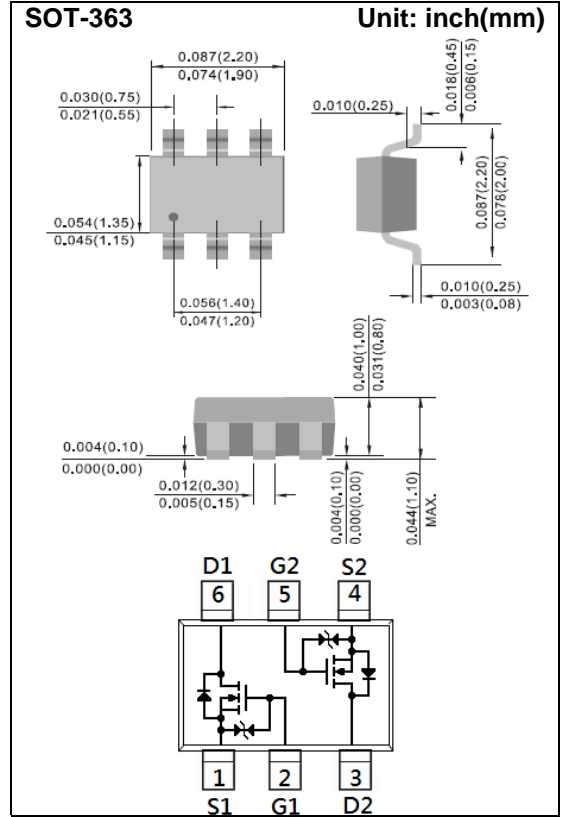
**Voltage** 30 V **Current** 500mA

### Features

- $R_{DS(ON)}$  ,  $V_{GS}@4.5V$  ,  $I_D@500mA < 1.2\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@2.5V$  ,  $I_D@200mA < 1.6\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@1.8V$  ,  $I_D@100mA < 2.3\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@1.5V$  ,  $I_D@10mA < 2.3\Omega$ (typ.)
- Specially Designed for Switch Load, PWM Application, etc.
- ESD Protected 2KV HBM
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Green molding compound as per IEC61249 Std.  
(Halogen Free)

### Mechanical Data

- Case: SOT-363 Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0002 ounces, 0.006 grams
- Marking: T12



### Maximum Ratings and Thermal Characteristics ( $T_A=25^\circ C$ unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNITS	
Drain-Source Voltage	$V_{DS}$	30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V	
Continuous Drain Current	$I_D$	500	mA	
Pulsed Drain Current (Note 4)	$I_{DM}$	1500	mA	
Power Dissipation	$P_D$	$T_a=25^\circ C$	350	mW
		Derate above $25^\circ C$	2.8	mW/ $^\circ C$
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ C$	
Typical Thermal resistance	$R_{\theta JA}$	357	$^\circ C/W$	
- Junction to Ambient (Note 3)				



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## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.6	0.85	1.1	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =500mA	-	0.87	1.2	Ω
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =200mA	-	1.25	1.6	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =100mA	-	1.6	2.3	
		V <sub>GS</sub> =1.5V, I <sub>D</sub> =10mA	-	2.3	-	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	-	0.01	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V	-	-	±10	
		V <sub>GS</sub> =±5V, V <sub>DS</sub> =0V	-	-	±1	
<b>Dynamic</b> (Note 5)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =500mA, V <sub>GS</sub> =4.5V (Note 1,2)	-	0.87	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	0.26	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	0.16	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1.0MHZ	-	34	-	pF
Output Capacitance	C <sub>oss</sub>		-	8.9	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	2.5	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, I <sub>D</sub> =80mA, V <sub>GS</sub> =4.0V, R <sub>G</sub> =6Ω (Note 1,2)	-	7.1	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	20	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	41	-	
Turn-Off Fall Time	t <sub>f</sub>		-	31	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>s</sub>	---	-	-	500	mA
Diode Forward Voltage	V <sub>SD</sub>	I <sub>s</sub> =500mA, V <sub>GS</sub> =0V	-	0.88	1.3	V

**NOTES :**

1. Pulse width ≤ 300us, Duty cycle ≤ 2%
2. Essentially independent of operating temperature typical characteristics.
3. R<sub>θJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins mounted on a 1 inch FR-4 with 2oz. square pad of copper.
4. The maximum current rating is package limited.
5. Guaranteed by design, not subject to production testing.



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## TYPICAL CHARACTERISTIC CURVES

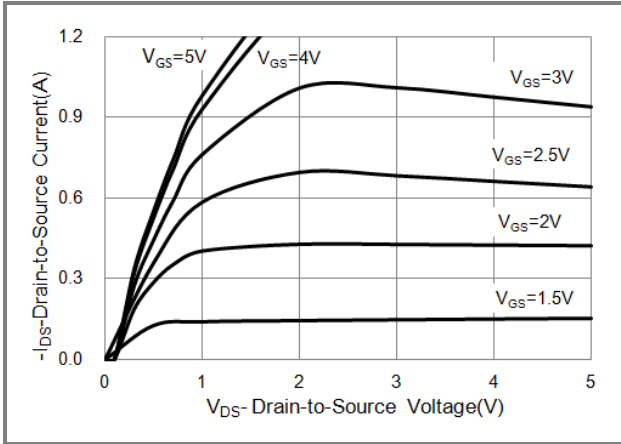


Fig.1 On-Region Characteristics

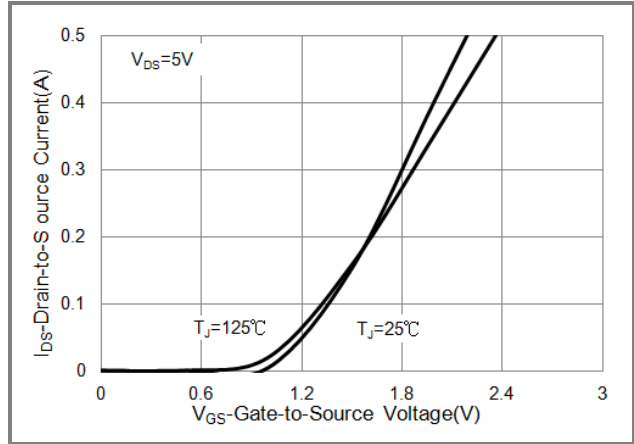


Fig.2 Transfer Characteristics

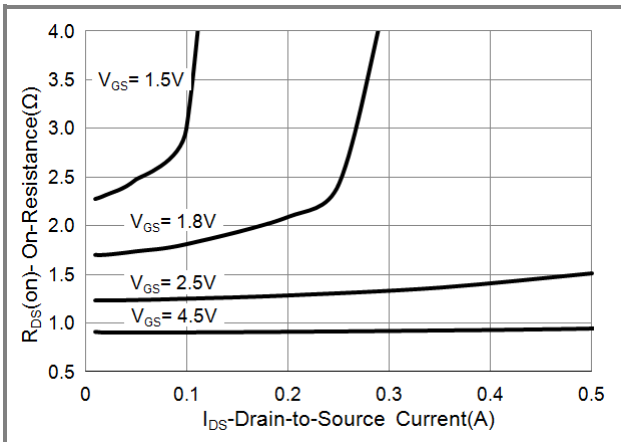


Fig.3 On-Resistance vs. Drain Current

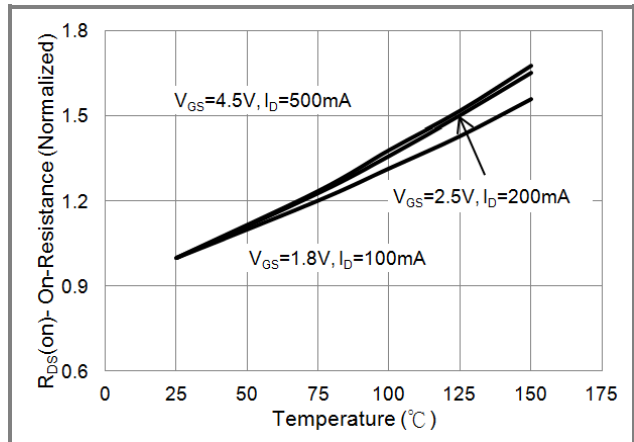


Fig.4 On-Resistance vs. Junction temperature

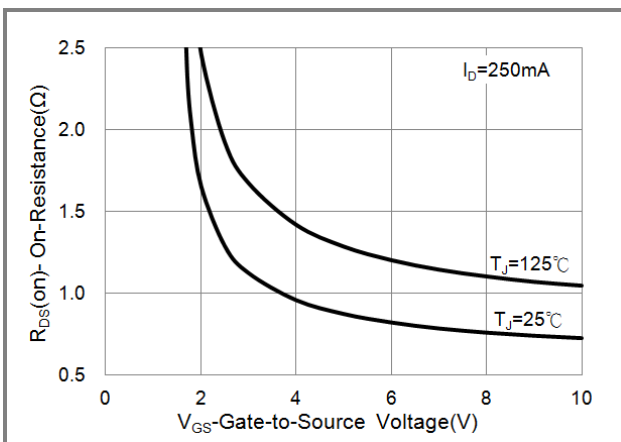


Fig.5 On-Resistance Variation with V\_GS.

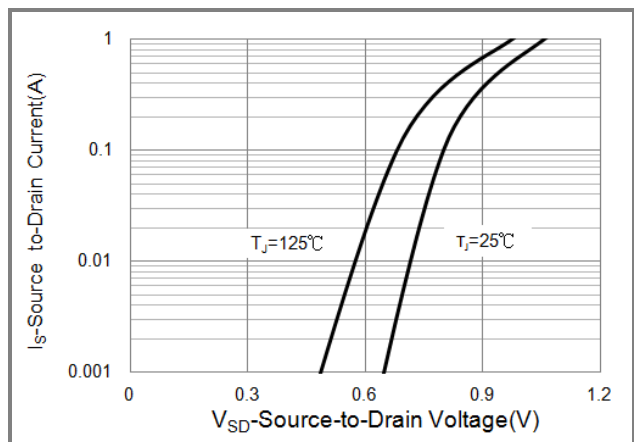


Fig.6 Body Diode Characteristics



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## TYPICAL CHARACTERISTIC CURVES

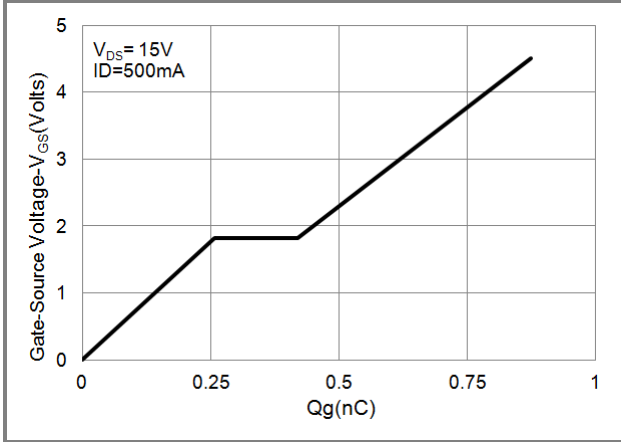


Fig.7 Gate-Charge Characteristics

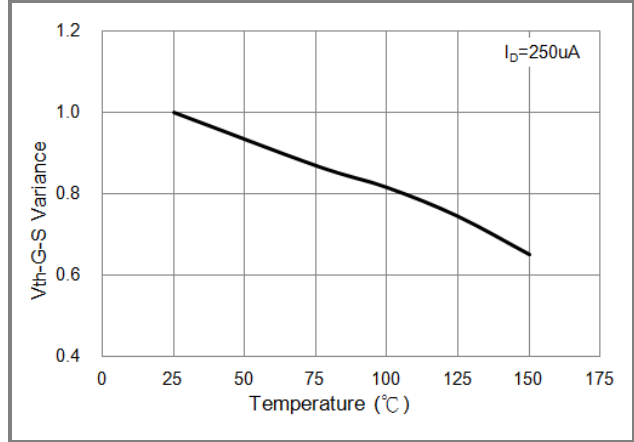


Fig.8 Threshold Voltage Variation with Temperature.

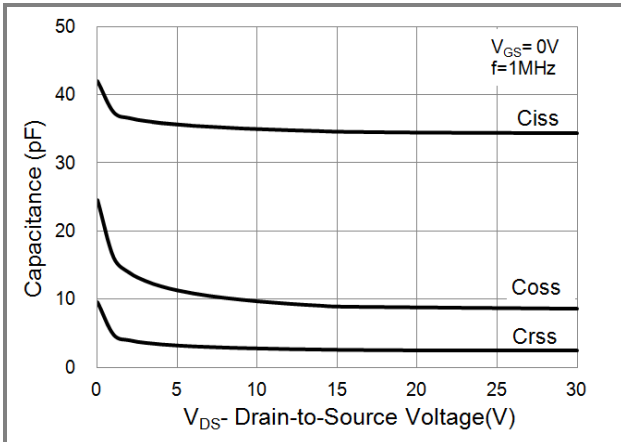


Fig.9 Capacitance vs. Drain-Source Voltage.

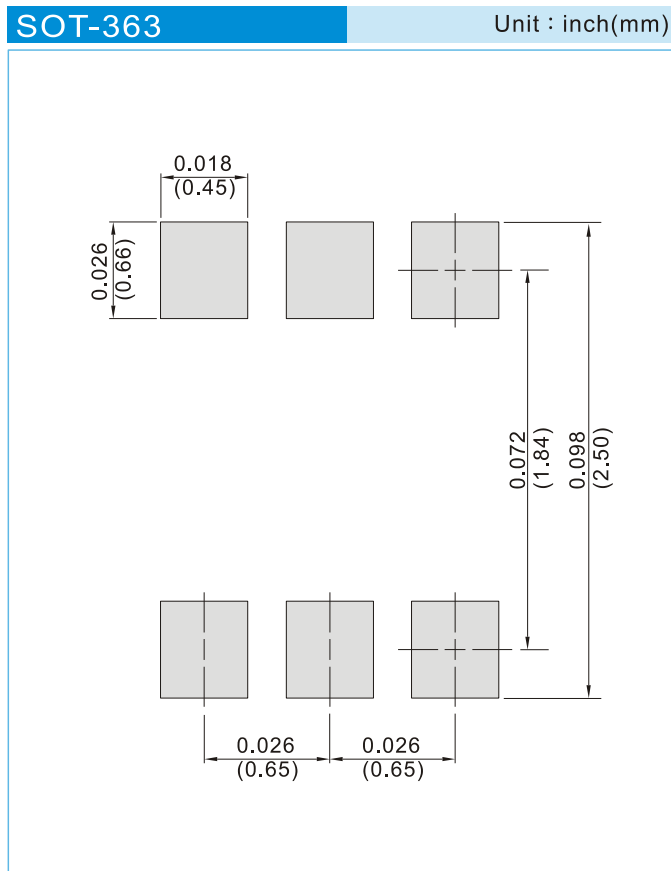


# PJT7812

## PART NO. PACKING CODE VERSION

PART NO. PACKING CODE	Package Type	Packing Type	Marking	Version
PJT7812_R1_00001	SOT-363	3K pcs / 7" reel	T12	Halogen free
PJT7812_R2_00001	SOT-363	12K pcs / 13" reel	T12	Halogen free

## MOUNTING PAD LAYOUT






## PJT7812

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