

# PJQ4443P

## 40V P-Channel Enhancement Mode MOSFET

**Voltage**

**-40 V**

**Current**

**-46 A**

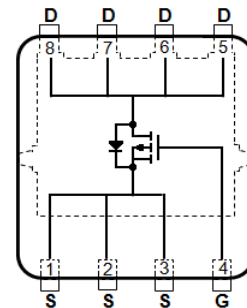
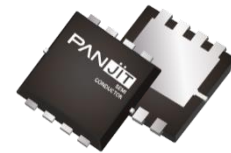
### Features

- $R_{DS(ON)}$  ,  $V_{GS}@-10V$  ,  $I_D@-10A < 12m\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@-4.5V$  ,  $I_D@-8A < 17.5m\Omega$
- Advanced Trench Process Technology
- High density cell design for ultralow on-resistance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : DFN3333-8L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.03 grams

DFN3333-8L



### Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V <sub>DS</sub>	-40	V
Gate-Source Voltage		V <sub>GS</sub>	±20	
Continuous Drain Current	T <sub>C</sub> =25°C	I <sub>D</sub>	-46	A
	T <sub>C</sub> =100°C		-29	
Pulsed Drain Current <sup>(Note 1)</sup>	T <sub>C</sub> =25°C	I <sub>DM</sub>	-166	
Power Dissipation	T <sub>C</sub> =25°C	P <sub>D</sub>	59.5	W
	T <sub>C</sub> =100°C		23	
Continuous Drain Current	T <sub>A</sub> =25°C	I <sub>D</sub>	-8.8	A
	T <sub>A</sub> =70°C		-7.1	
Power Dissipation	T <sub>A</sub> =25°C	P <sub>D</sub>	2.1	W
Power Dissipation	T <sub>A</sub> =70°C		1.3	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55~150	°C
Typical Thermal Resistance <sup>(Note 4,5)</sup>	Junction to Case	R <sub>θJC</sub>	2.1	°C/W
	Junction to Ambient	R <sub>θJA</sub>	59.5	

- Limited only By Maximum Junction Temperature

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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	-40	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1	-1.52	-2.5	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A	-	10	12	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-8A	-	13.5	17.5	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-40V, V <sub>GS</sub> =0V	-	-	-1.0	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>Dynamic</b> (Note 6)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-32V, I <sub>D</sub> =-10A, V <sub>GS</sub> =-4.5V <sup>(Note 1,2)</sup>	-	23	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	8.5	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	9	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f=1.0MHZ	-	2767	-	pF
Output Capacitance	C <sub>oss</sub>		-	247	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	139	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =-20V, I <sub>D</sub> =-1A, V <sub>GS</sub> =-10V, R <sub>G</sub> =6Ω (Note 1,2)	-	23	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	10	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	135	-	
Turn-Off Fall Time	t <sub>f</sub>		-	50	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	---	-	-	-46	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V	-	-0.7	-1	V

**NOTES :**

1. Pulse width ≤ 300us, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C. Ratings are based on low frequency and duty cycles to keep initial T<sub>J</sub> = 25°C.
4. The maximum current rating is package limited.
5. 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<sup>2</sup> with 2oz.square pad of copper.
6. Guaranteed by design, not subject to production testing.

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## TYPICAL CHARACTERISTIC CURVES

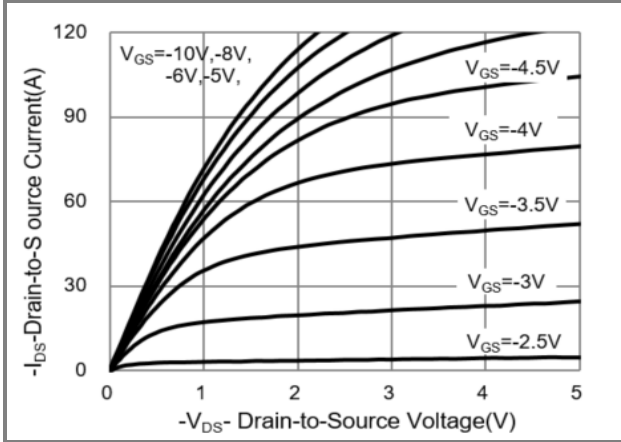


Fig.1 On-Region Characteristics

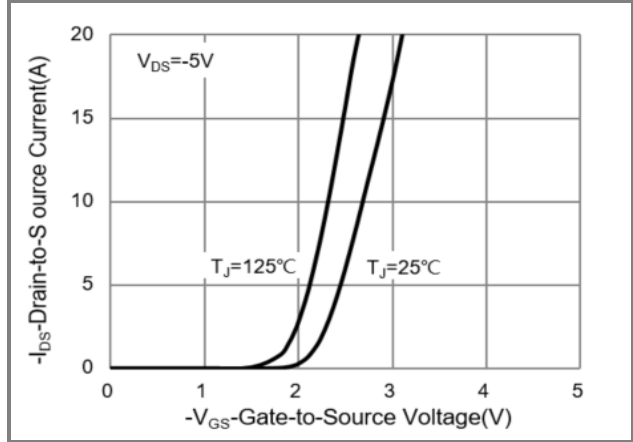


Fig.2 Transfer Characteristics

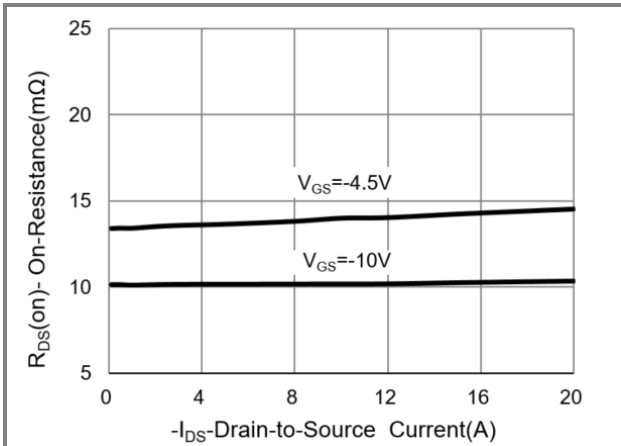


Fig.3 On-Resistance vs. Drain Current

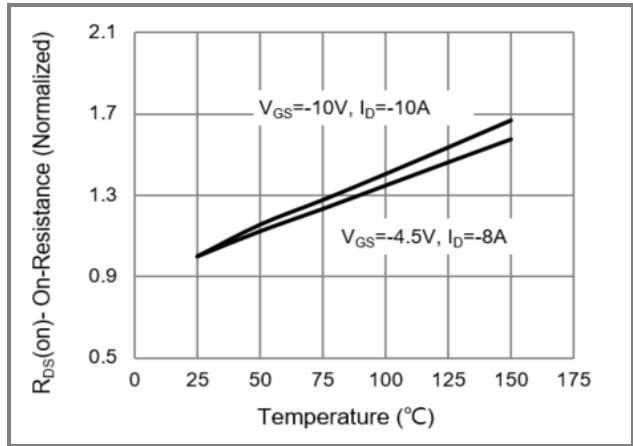


Fig.4 On-Resistance vs. Junction temperature

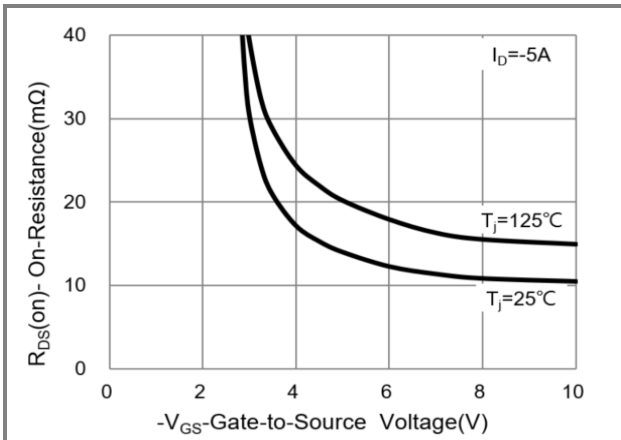


Fig.5 On-Resistance Variation with  $V_{GS}$

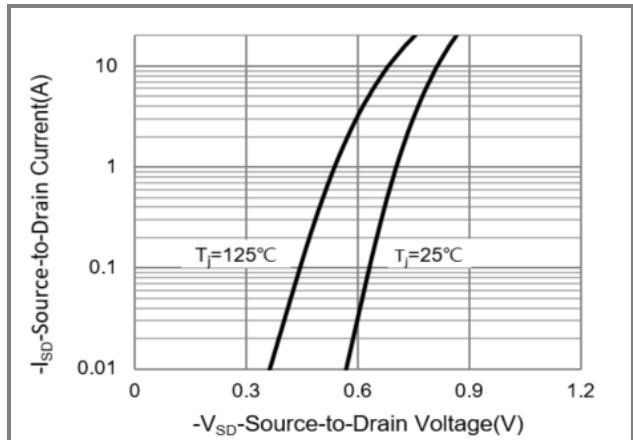
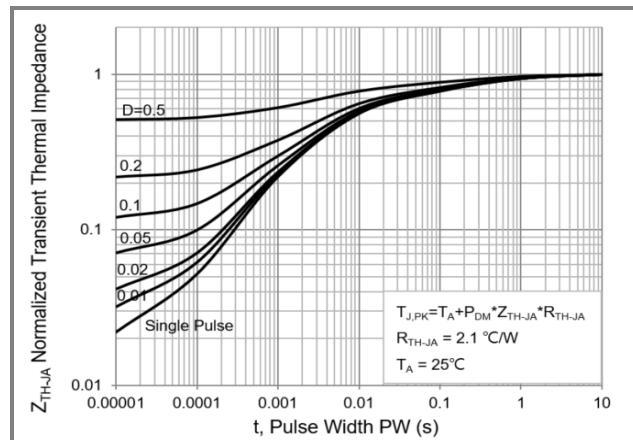
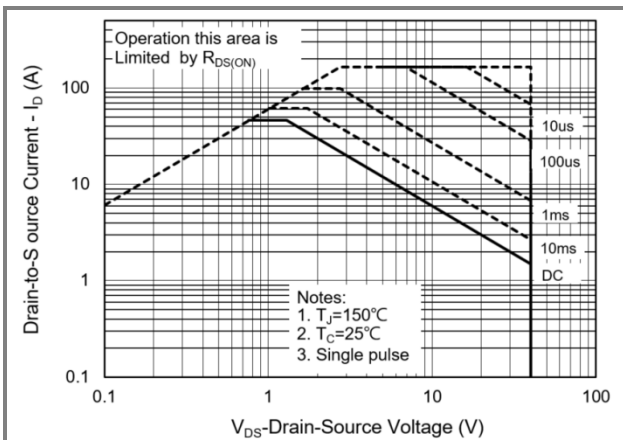
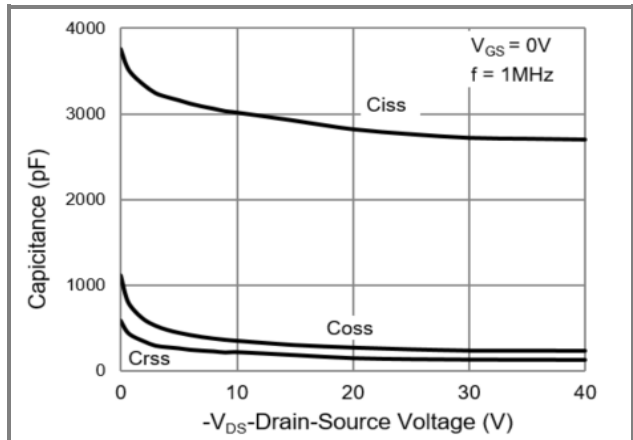
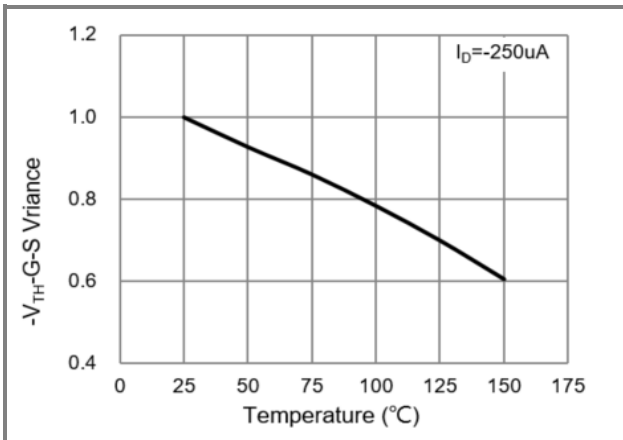
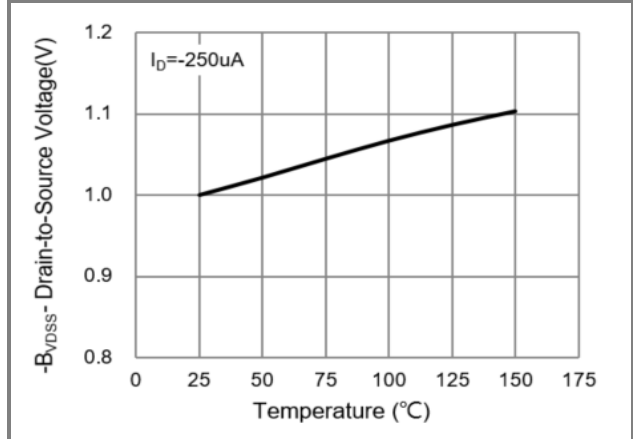
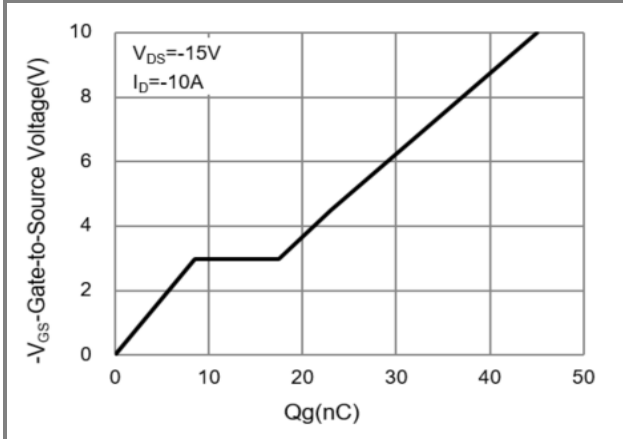


Fig.6 Source-Drain Diode Forward Voltage

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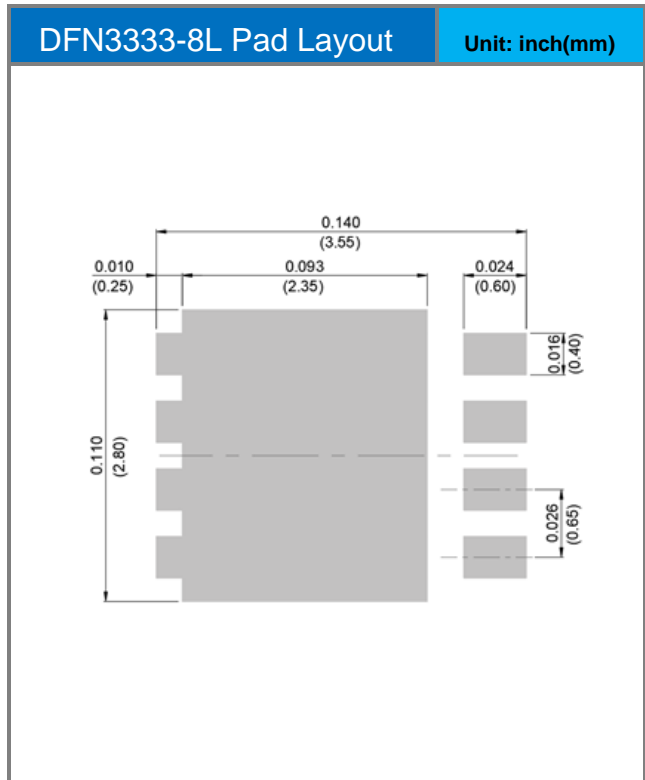
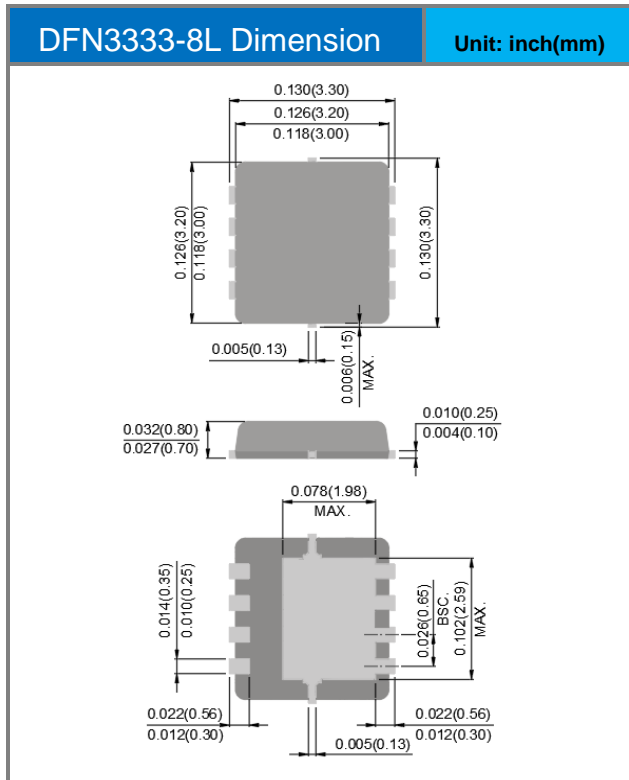


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Part No. Packing Code Version

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJQ4443P_R2_00001	DFN3333-8L	5K pcs / 13" reel	4443	Halogen free RoHS compliant

## Packaging Information & Mounting Pad Layout



## PJQ4443P

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