



# PJQ2405

## 20V P-Channel Enhancement Mode MOSFET

**Voltage**

**-20 V**

**Current**

**-7.2A**

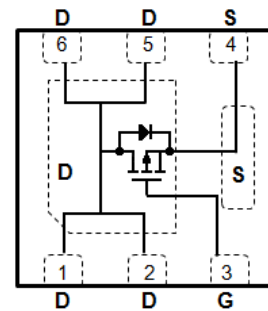
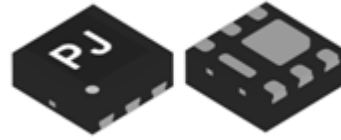
### Features

- $R_{DS(ON)}$  ,  $V_{GS}@-4.5V$  ,  $I_D@-7.2A < 32m\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@-2.5V$  ,  $I_D@-5.0A < 39m\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@-1.8V$  ,  $I_D@-2.5A < 48m\Omega$
- Advanced Trench Process Technology
- High density cell design for ultra low on-resistance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : DFN2020B-6L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0003 ounces, 0.0086 grams

DFN2020B-6L



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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		$V_{DS}$	-20	V
Gate-Source Voltage		$V_{GS}$	$\pm 8$	V
Continuous Drain Current		$I_D$	-7.2	A
Pulsed Drain Current		$I_{DM}$	-28.8	A
Power Dissipation	$T_a=25^\circ\text{C}$	$P_D$	2.8	W
	Derate above $25^\circ\text{C}$		22	mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
Typical Thermal Resistance		$R_{\theta JA}$	44.6	$^\circ\text{C/W}$
- Junction to Ambient, $t < 10s$ (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	-20	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-0.35	-0.6	-0.9	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-7.2A	-	25	32	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-5.0A	-	30	39	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2.5A	-	35	48	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V	-	-0.01	-1.0	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V	-	±10	±100	nA
<b>Dynamic</b> (Note 6)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-7.2A, V <sub>GS</sub> =-4.5V (Note 1,2)	-	18.9	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	2.8	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	4.2	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1.0MHZ	-	1785	-	pF
Output Capacitance	C <sub>oss</sub>		-	152	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	125	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-7.2A, V <sub>GEN</sub> =-4.5V, R <sub>L</sub> =10Ω R <sub>G</sub> =6Ω (Note 1,2)	-	12	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	68	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	82	-	
Turn-Off Fall Time	t <sub>f</sub>		-	35	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>s</sub>	---	-	-	-1.5	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>s</sub> =-1A, V <sub>GS</sub> =0V	-	-0.64	-1.2	V

**NOTES :**

1. Pulse width ≤ 300us, Duty cycle ≤ 2%
2. Essentially independent of operating temperature typical characteristics.
3. The maximum current rating is package limited.
4. Repetitive rating, pulse width limited by junction temperature T<sub>J</sub>(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T<sub>J</sub> =25°C.
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.



# PJQ2405

## TYPICAL CHARACTERISTIC CURVES

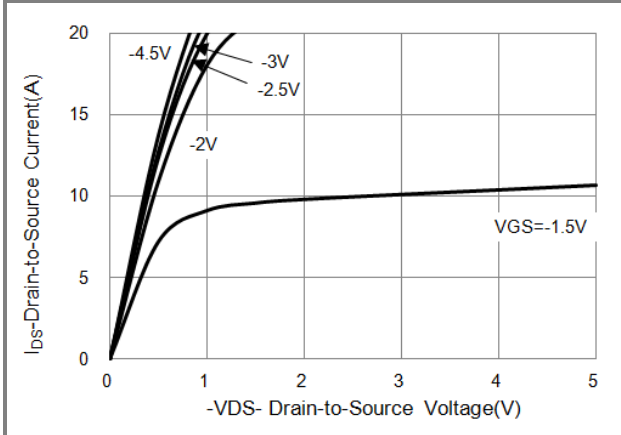


Fig.1 On-Region Characteristics

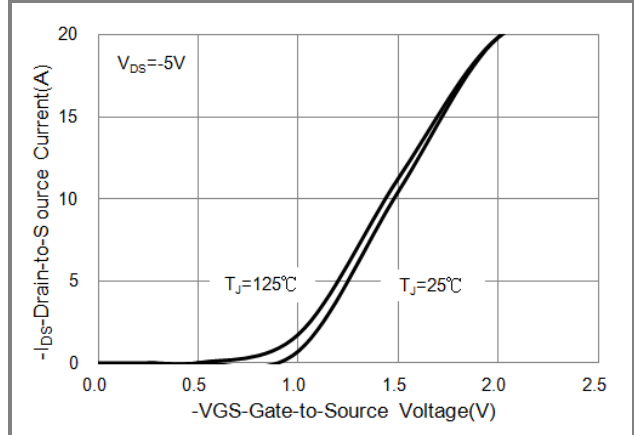


Fig.2 Transfer Characteristics

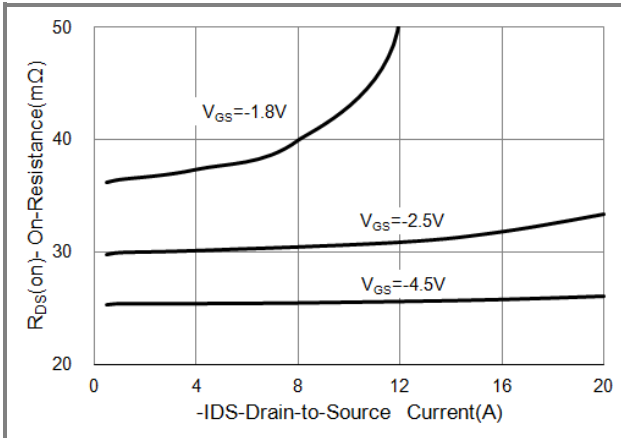


Fig.3 On-Resistance vs. Drain Current

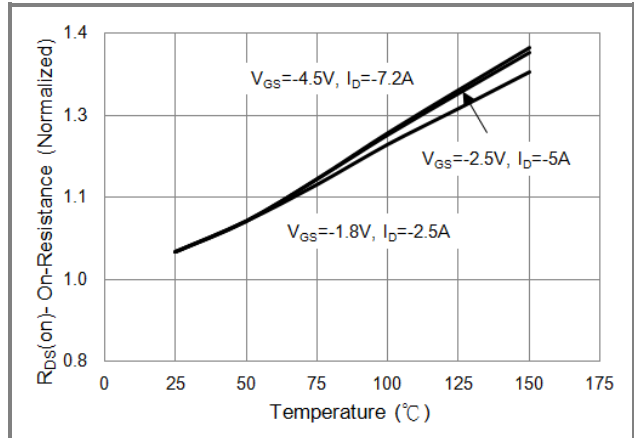


Fig.4 On-Resistance vs. Junction temperature

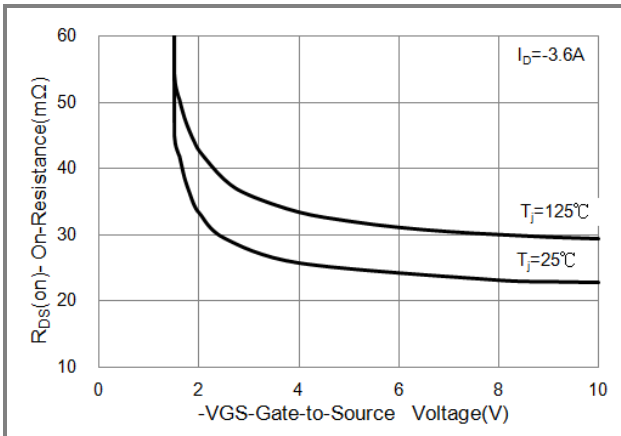


Fig.5 On-Resistance Variation with VGS.

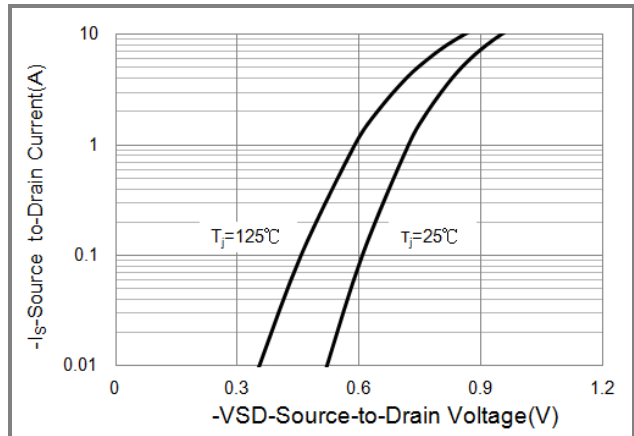


Fig.6 Body Diode Characteristics



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## TYPICAL CHARACTERISTIC CURVES

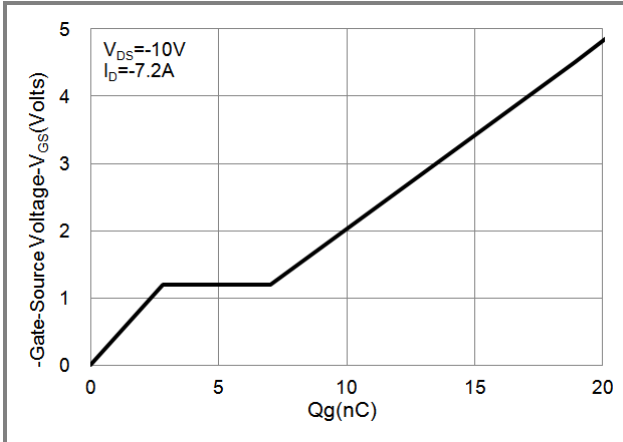


Fig.7 Gate-Charge Characteristics

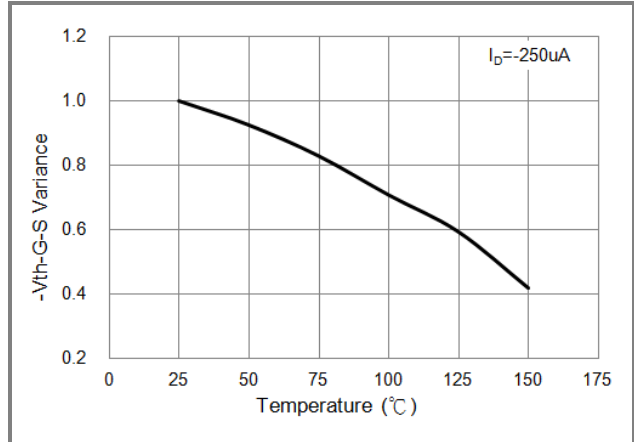


Fig.8 Threshold Voltage Variation with Temperature.

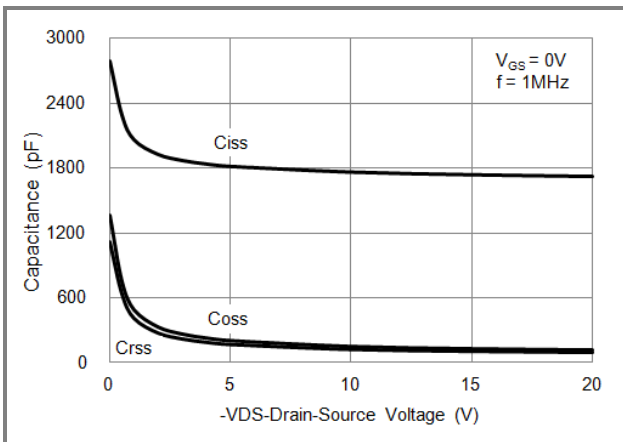


Fig.9 Capacitance vs. Drain-Source Voltage.

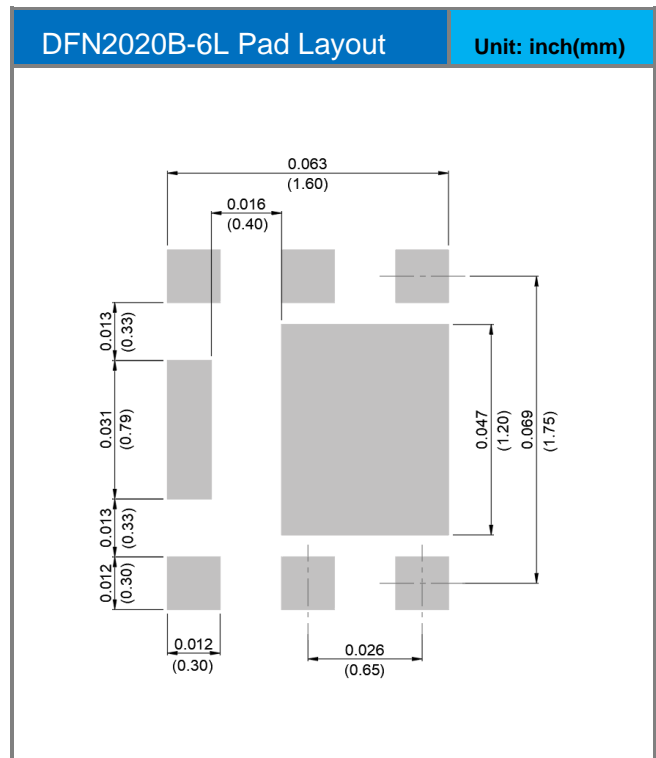
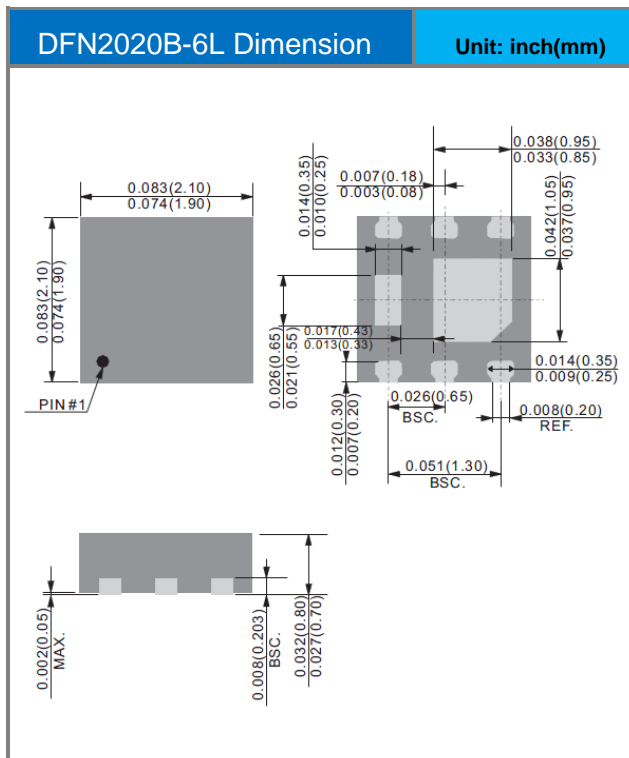


# PJQ2405

Part No. Packing Code Version

Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJQ2405_R1_00001	DFN2020B-6L	3K pcs / 7" reel	405	Halogen free RoHS compliant

## Packaging Information & Mounting Pad Layout





## PJQ2405

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