



# PJQ2888

## 20V P-Channel Enhancement Mode MOSFET with TVS Diode

**Voltage** -20 V **Current** -1.5A

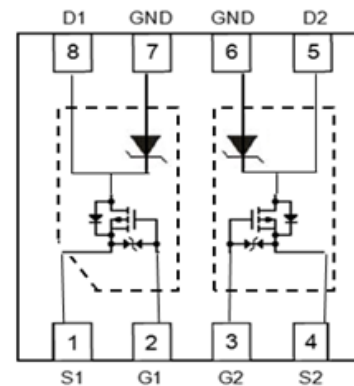
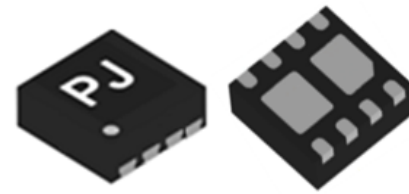
### Features

- RDS(ON) , VGS@-4.5V, ID@-1.5A<325mΩ
- RDS(ON) , VGS@-2.5V, ID@-1.2A<420mΩ
- RDS(ON) , VGS@-2.5V, ID@-0.5A<600mΩ
- Advanced Trench Process Technology
- 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 : DFN2020-8L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.00032 ounces, 0.0093 grams
- Marking : 888

DFN2020-8L



## 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>	-20	V
Gate-Source Voltage	V <sub>GS</sub>	±8	V
Continuous Drain Current	I <sub>D</sub>	-1.5	A
Pulsed Drain Current <sup>(Note 4)</sup>	I <sub>DM</sub>	-6.0	A
Power Dissipation	P <sub>D</sub>	T <sub>a</sub> =25°C	1.25
		Derate above 25°C	10
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~150	°C
Typical Thermal resistance	R <sub>θJA</sub>	100	°C/W
- Junction to Ambient <sup>(Note 3)</sup>			



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## Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.64	-1.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-1.5A$	-	240	325	m $\Omega$
		$V_{GS}=-2.5V, I_D=-1.2A$	-	295	420	
		$V_{GS}=-1.8V, I_D=-0.5A$	-	405	600	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$	-	-0.02	-1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0V$	-	$\pm 3.5$	$\pm 10$	$\mu A$
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-10V, I_D=-1.5A,$ $V_{GS}=-4.5V$ (Note 1,2)	-	2.2	-	nC
Gate-Source Charge	$Q_{gs}$		-	0.4	-	
Gate-Drain Charge	$Q_{gd}$		-	0.5	-	
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0V,$ $f=1.0\text{MHz}$	-	150	-	pF
Output Capacitance	$C_{oss}$		-	27	-	
Reverse Transfer Capacitance	$C_{rss}$		-	9	-	
<b>Switching</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-1.5A,$ $V_{GS}=-4.5V,$ $R_G=6\Omega$ (Note 1,2)	-	11	-	ns
Turn-On Rise Time	$t_r$		-	38	-	
Turn-Off Delay Time	$t_{d(off)}$		-	130	-	
Turn-Off Fall Time	$t_f$		-	75	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	---	-	-	-1.0	A
Diode Forward Voltage	$V_{SD}$	$I_S=-1A, V_{GS}=0V$	-	-0.93	-1.2	V

NOTES :

1. Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$
2. Essentially independent of operating temperature typical characteristics.
3.  $R_{\theta JA}$  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.



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## Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>TVS Diode</b>						
Working Peak Reverse Voltage	$V_{RWM}$	---	-	-	15	V
Maximum Reverse Leakage Current	$I_R$	$V_{RWM}=15\text{V}$	-	-	1	$\mu\text{A}$
Breakdown Voltage	$V_{BR}$	$I_T=1\text{mA}$	17	-	-	V
Max. Capacitance	$C_J$	$f=1\text{MHz}, V_R=0\text{V}$	-	-	15	$\text{pF}$
Clamping Voltage	$V_C$	Max Per 8x20us	-	-	30	V
Maximum Reverse Peak Pulse Current	$I_{PP}$	---	-	-	2	A
Test Current	$I_T$	---	-	-	1.0	$\text{mA}$



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## TYPICAL CHARACTERISTIC CURVES

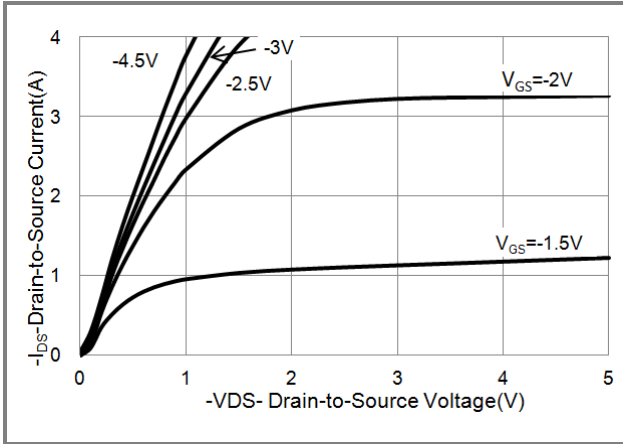


Fig.1 On-Region Characteristics

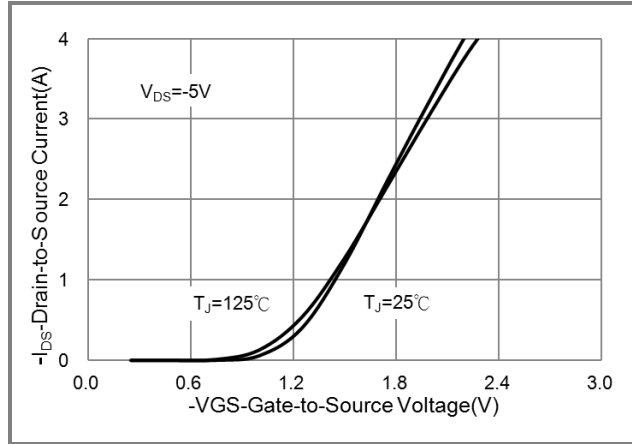


Fig.2 Transfer Characteristics

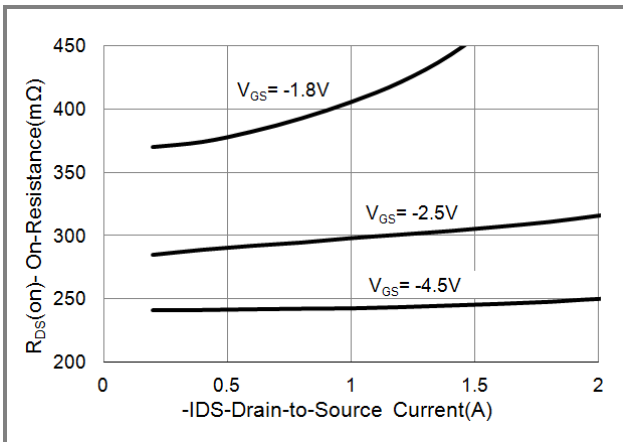


Fig.3 On-Resistance vs. Drain Current

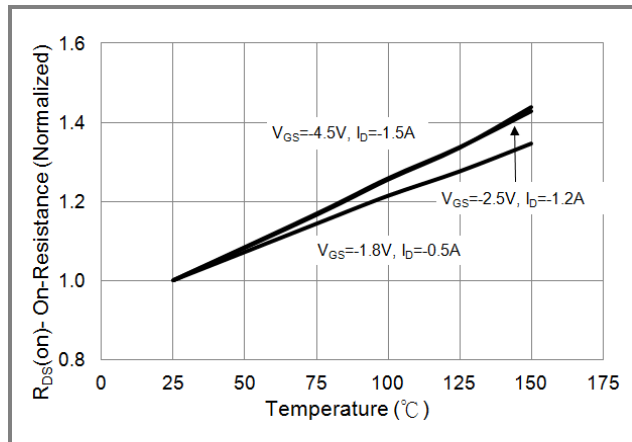


Fig.4 On-Resistance vs. Junction temperature

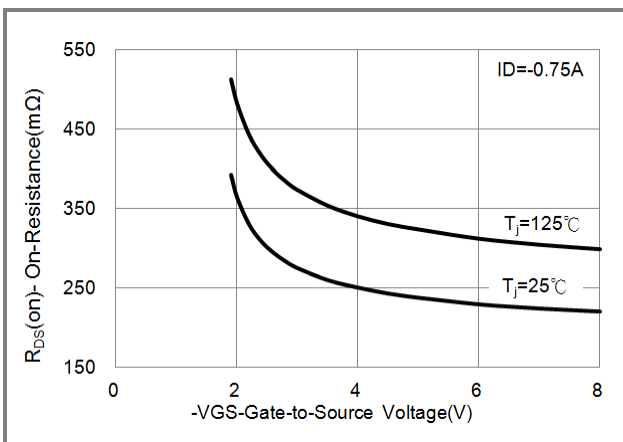


Fig.5 On-Resistance Variation with VGS.

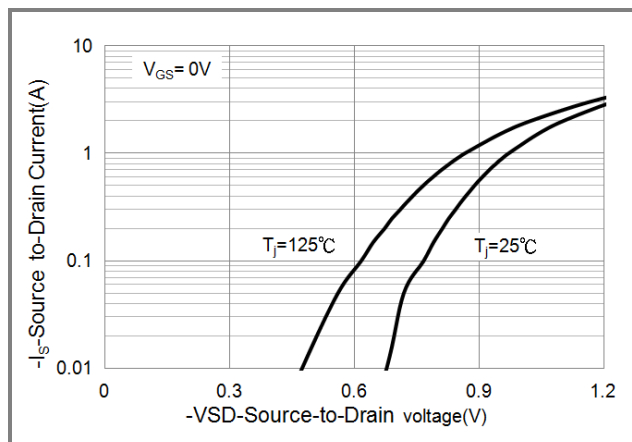


Fig.6 Body Diode Characteristics



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## TYPICAL CHARACTERISTIC CURVES

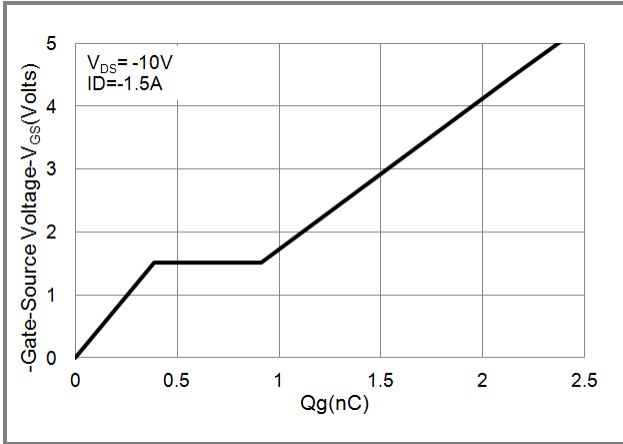


Fig.7 Gate-Charge Characteristics

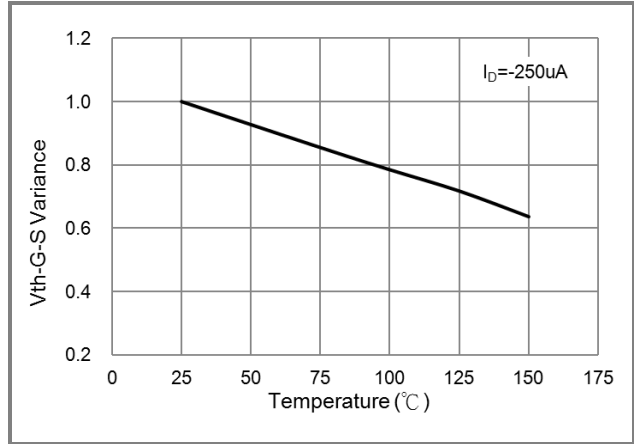


Fig.8 Threshold Voltage Variation with Temperature.

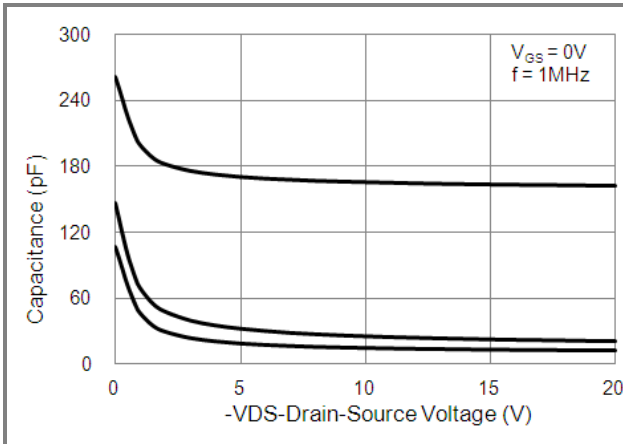


Fig.9 Capacitance vs. Drain-Source Voltage.

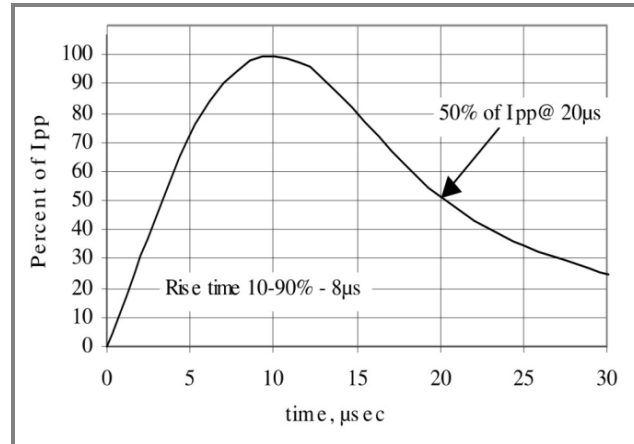


Fig.10 TVS Diode Surge Pulse Waveform Definition.

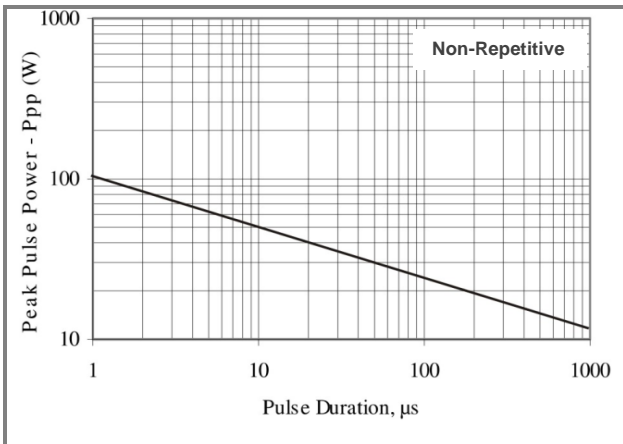


Fig.11 TVS Diode Peak Pulse Power vs. Pulse Time

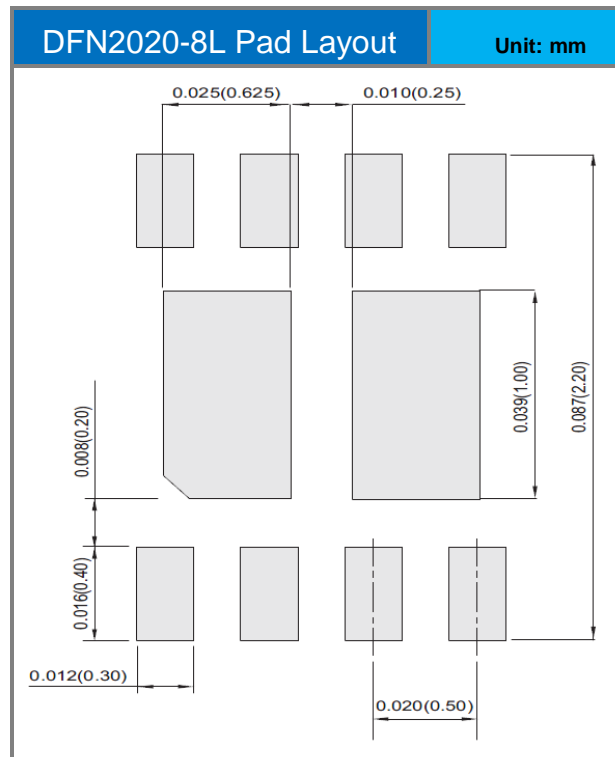
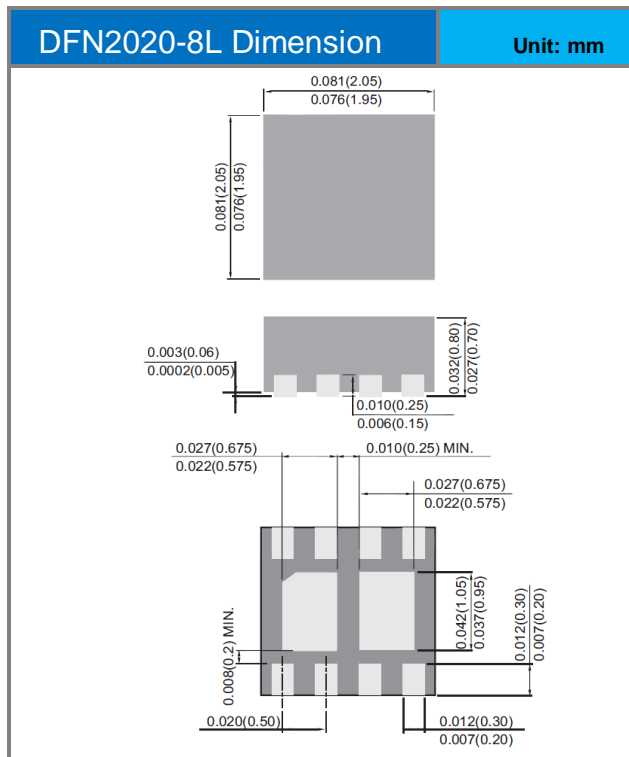


# PJQ2888

## PART NO PACKING CODE VERSION

PART NO PACKING CODE	Package Type	Packing type	Marking	Version
PJQ2888_R1_00001	DFN2020-8L	3K pcs / 7" reel	888	Halogen free

## MOUNTING PAD LAYOUT





## PJQ2888

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