



# PJQ5478

## 100V N-Channel Enhancement Mode MOSFET

**Voltage** 100 V **Current** 60A

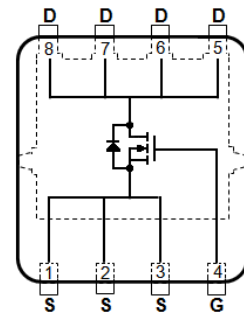
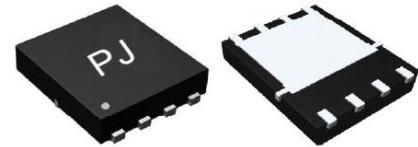
### Features

- RDS(ON) , VGS@10V, ID@30A<12mΩ
- Advanced Trench Process Technology
- High density cell design for ultra low on-resistance
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Green molding compound as per IEC61249 Std. (Halogen Free)

### Mechanical Data

- Case: DFN5060-8L Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0028 ounces, 0.08 grams
- Marking: Q5478

DFN5060-8L



### 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>	100	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	T <sub>C</sub> =25°C	60
		T <sub>C</sub> =100°C	38
Pulsed Drain Current <sup>(Note 1)</sup>	I <sub>DM</sub>	T <sub>C</sub> =25°C	150
Power Dissipation	P <sub>D</sub>	T <sub>C</sub> =25°C	83
		T <sub>C</sub> =100°C	33
Continuous Drain Current	I <sub>D</sub>	T <sub>A</sub> =25°C	9
		T <sub>A</sub> =70°C	7.5
Power Dissipation	P <sub>D</sub>	T <sub>A</sub> =25°C	2.0
		T <sub>A</sub> =70°C	1.3
Single Pulse Avalanche Energy <sup>(Note 6)</sup>	E <sub>AS</sub>	156	mJ
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>	1.5
	Junction to Ambient	R <sub>θJA</sub>	62.5

- Limited only By Maximum Junction Temperature



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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	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$	-	9	12	m $\Omega$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$	-	-	1.0	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>Dynamic</b> (Note 7)						
Total Gate Charge	$Q_g$	$V_{DS}=50V, I_D=30A,$ $V_{GS}=10V$ (Note 1,2)	-	145	-	nC
Gate-Source Charge	$Q_{gs}$		-	25	-	
Gate-Drain Charge	$Q_{gd}$		-	43	-	
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V,$ $f=1.0\text{MHz}$	-	3921	-	pF
Output Capacitance	$C_{oss}$		-	255	-	
Reverse Transfer Capacitance	$C_{rss}$		-	96	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=50V, I_D=30A,$ $V_{GS}=10V,$ $R_G=3\Omega$ (Note 1,2)	-	27	-	ns
Turn-On Rise Time	$t_r$		-	13	-	
Turn-Off Delay Time	$t_{d(off)}$		-	15	-	
Turn-Off Fall Time	$t_f$		-	43	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	---	-	-	60	A
Diode Forward Voltage	$V_{SD}$	$I_S=30A, V_{GS}=0V$	-	0.8	1.3	V

NOTES :

1. Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature  $T_J$  (MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial  $T_J = 25^\circ\text{C}$ .
4. The maximum current rating is package limited.
5.  $R_{\theta JA}$  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<sup>2</sup> with 2oz. square pad of copper.
6. The test condition is  $L=0.5\text{mH}, I_{AS}=25A, V_{DD}=25V, V_{GS}=10V$
7. Guaranteed by design, not subject to production testing.



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## TYPICAL CHARACTERISTIC CURVES

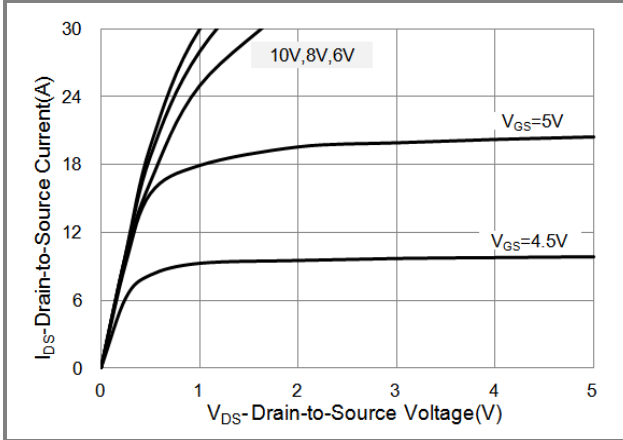


Fig.1 Output Characteristics

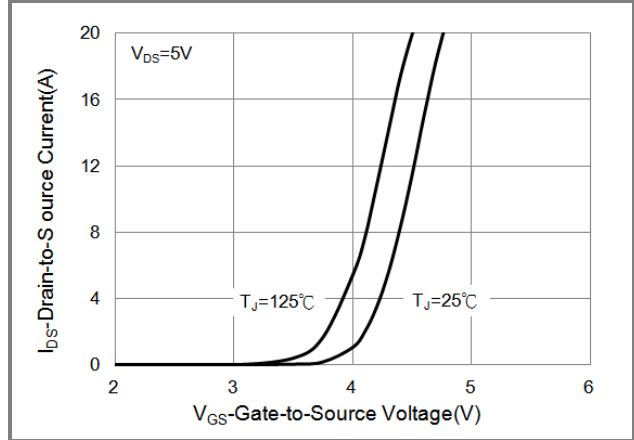


Fig.2 Transfer Characteristics

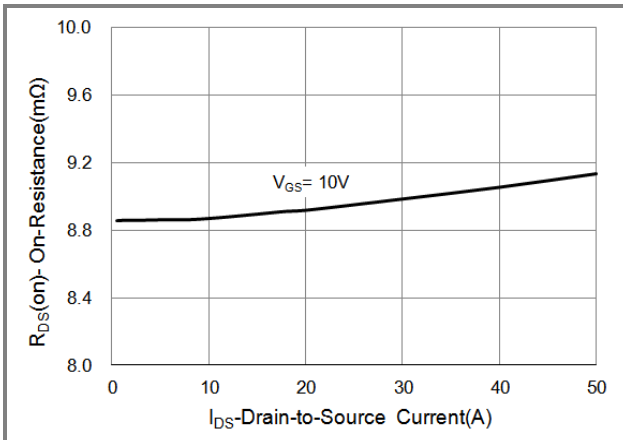


Fig.3 On-Resistance vs. Drain Current

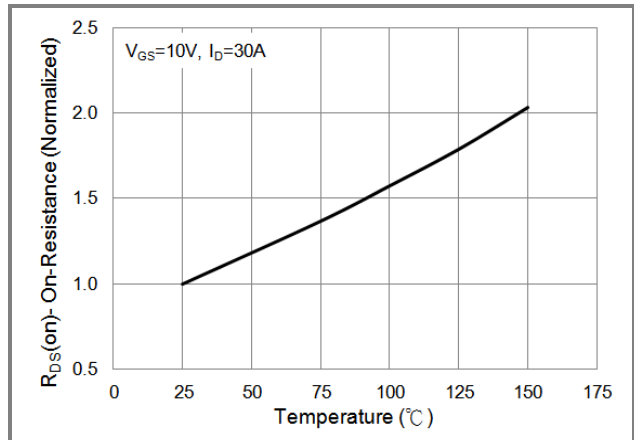


Fig.4 On-Resistance vs. Junction temperature

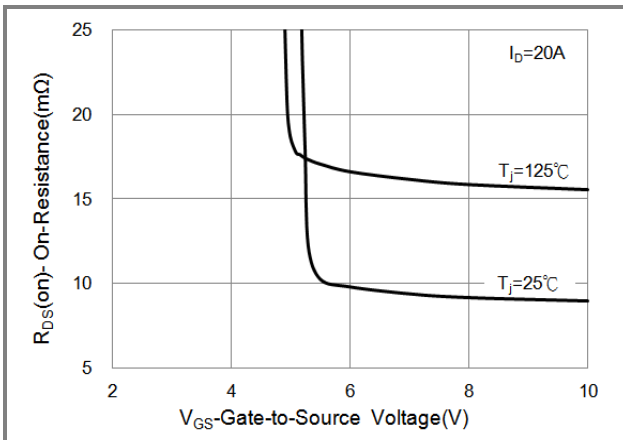


Fig.5 On-Resistance Variation with VGS.

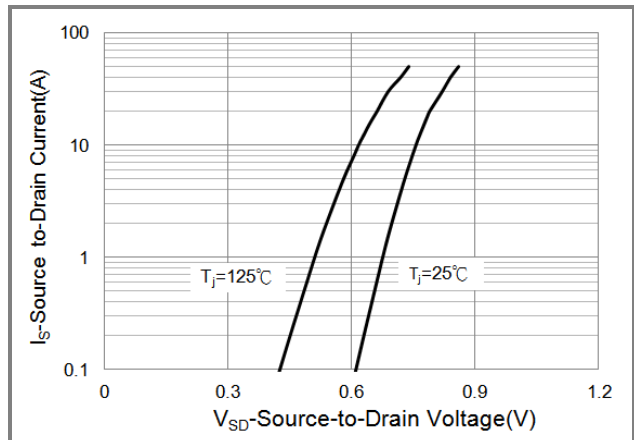


Fig.6 Source-Drain Diode Forward Voltage



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## TYPICAL CHARACTERISTIC CURVES

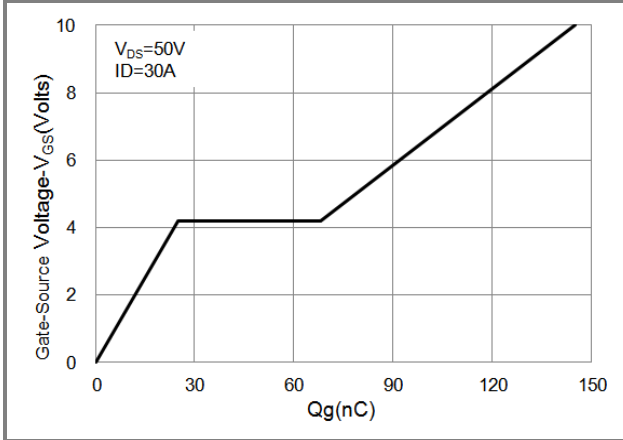


Fig.7 Gate-Charge Characteristics

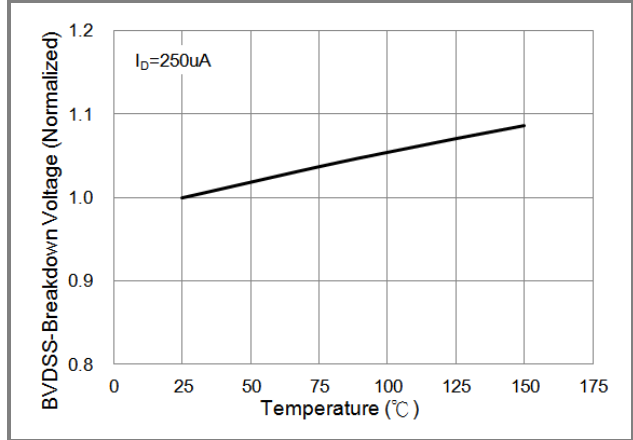


Fig.8 Breakdown Voltage Variation vs. Temperature

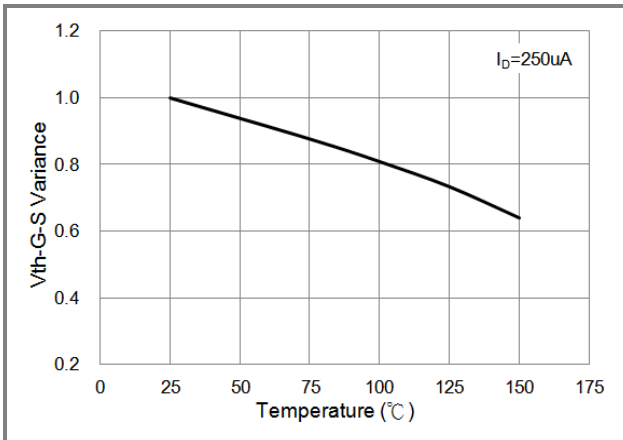


Fig.9 Threshold Voltage Variation with Temperature

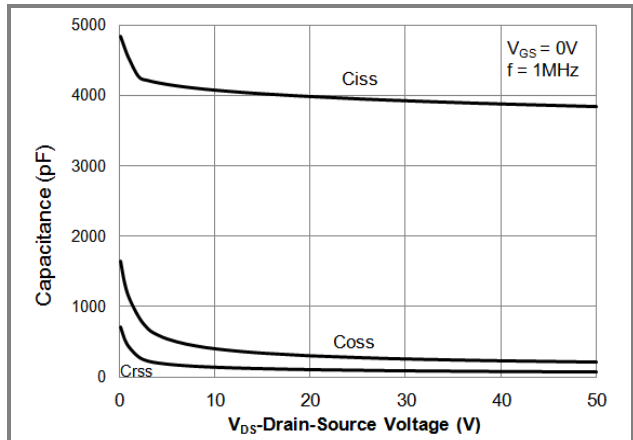


Fig.10 Capacitance vs. Drain-Source Voltage

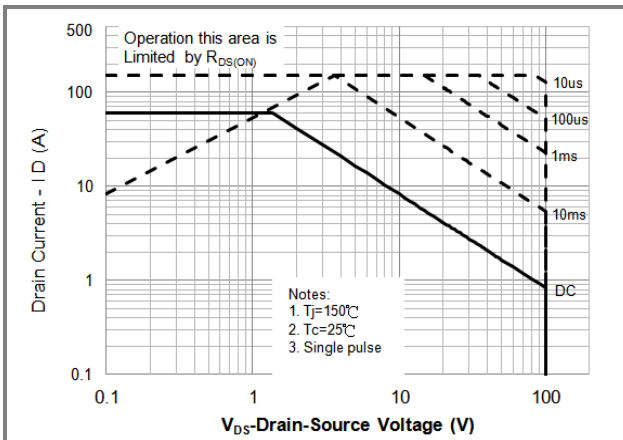


Fig.11 Maximum Safe Operating Area



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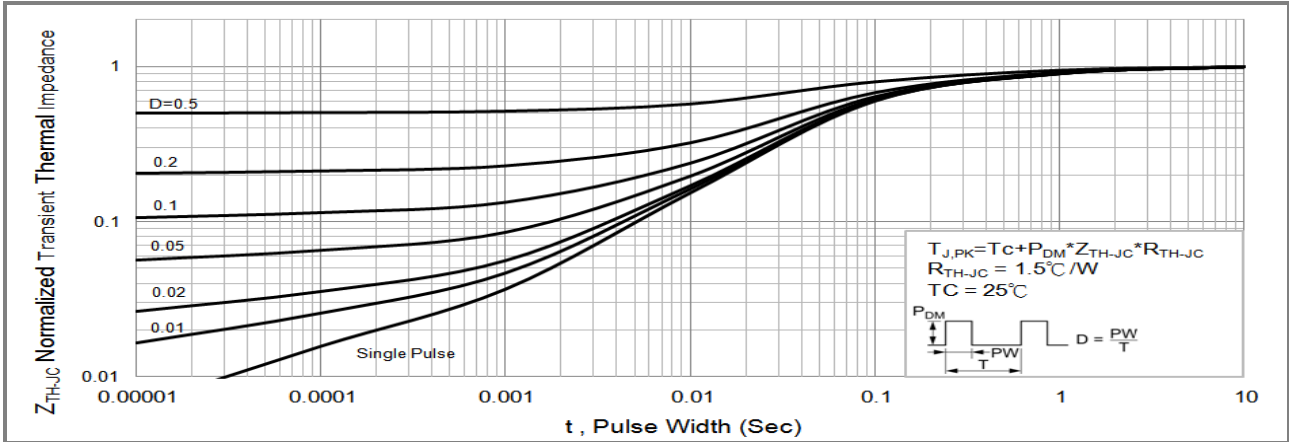


Fig.12 Normalized Transient Thermal Impedance vs. Pulse Width

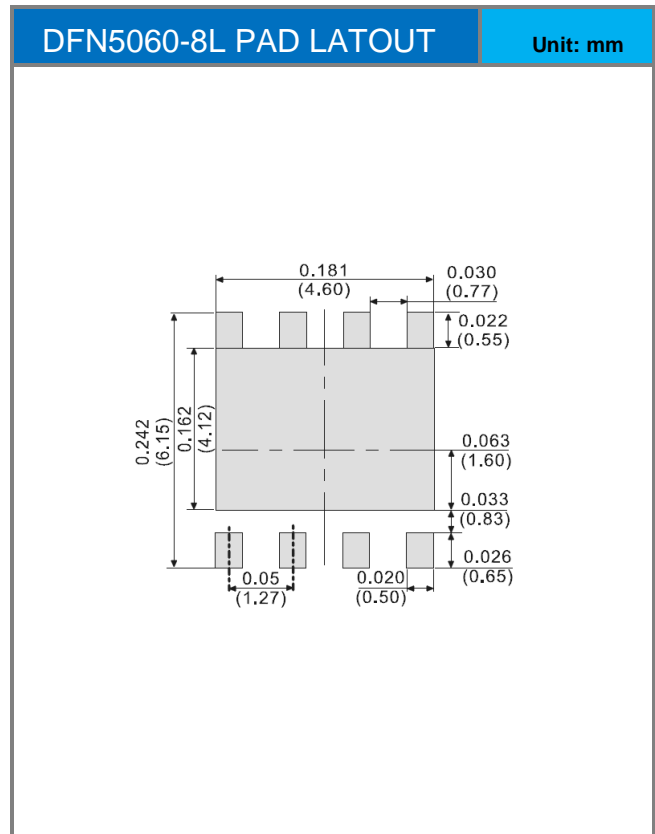
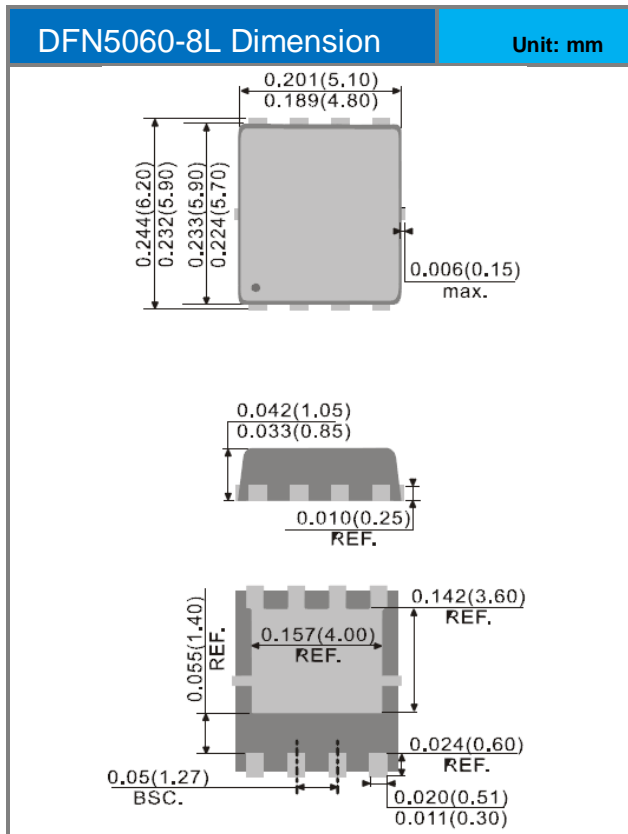


# PJQ5478

## PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
PJQ5478_R2_00001	DFN5060-8L	3000pcs / 13" reel	Q5478	Halogen free

## Packaging Information & Mounting Pad Layout





## PJQ5478

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