



# PJQ5461A

## 60V P-Channel Enhancement Mode MOSFET

**Voltage**

**-60 V**

**Current**

**-11.5 A**

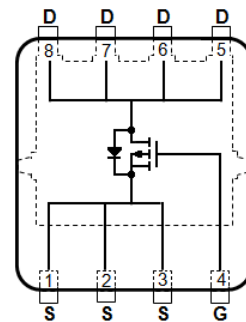
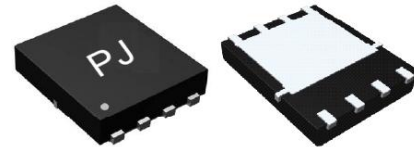
### Features

- $R_{DS(ON)}, V_{GS}@-10V, I_D@-6A < 110m\Omega$
- $R_{DS(ON)}, V_{GS}@-4.5V, I_D@-3A < 130m\Omega$
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- Low reverse transfer capacitance
- 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: Q5461A

DFN5060-8L



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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		$V_{DS}$	-60	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$T_C=25^\circ\text{C}$	$I_D$	-11.5	A
	$T_C=100^\circ\text{C}$		-7.2	
Pulsed Drain Current <sup>(Note 1)</sup>	$T_C=25^\circ\text{C}$	$I_{DM}$	-35	
Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	26	W
	$T_C=100^\circ\text{C}$		10	
Continuous Drain Current	$T_A=25^\circ\text{C}$	$I_D$	-3.2	A
	$T_A=70^\circ\text{C}$		-2.5	A
Power Dissipation	$T_A=25^\circ\text{C}$	$P_D$	2.0	W
Power Dissipation	$T_A=70^\circ\text{C}$		1.3	
Single Pulse Avalanche Energy <sup>(Note 6)</sup>		$E_{AS}$	20	mJ
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
Typical Thermal Resistance <sup>(Note 4,5)</sup>	Junction to Case	$R_{\theta JC}$	4.8	$^\circ\text{C/W}$
	Junction to Ambient	$R_{\theta JA}$	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	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.7	-2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-6A$	-	87	110	m $\Omega$
		$V_{GS}=-4.5V, I_D=-3A$	-	110	130	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$	-	-	-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	$Q_g$	$V_{DS}=-30V, I_D=-4A,$ $V_{GS}=-10V$ (Note 1,2)	-	10	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.6	-	
Gate-Drain Charge	$Q_{gd}$		-	3	-	
Input Capacitance	$C_{iss}$	$V_{DS}=-30V, V_{GS}=0V,$ $f=1.0\text{MHz}$	-	785	-	pF
Output Capacitance	$C_{oss}$		-	175	-	
Reverse Transfer Capacitance	$C_{rss}$		-	112	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-30V, R_L=30\Omega,$ $V_{GS}=-10V, R_G=6.2\Omega$ (Note 1,2)	-	8	-	ns
Turn-On Rise Time	$t_r$		-	15	-	
Turn-Off Delay Time	$t_{d(off)}$		-	43	-	
Turn-Off Fall Time	$t_f$		-	8.4	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	---	-	-	-11.5	A
Diode Forward Voltage	$V_{SD}$	$I_S=-1A, V_{GS}=0V$	-	-0.76	-1.0	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  $T_J(\text{MAX})=150^\circ\text{C}$ . 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  $L=0.1\text{mH}$ ,  $I_{AS}=20A$ ,  $V_{DD}=25V$ ,  $V_{GS}=10V$
7. Guaranteed by design, not subject to production testing.



# PJQ5461A

## TYPICAL CHARACTERISTIC CURVES

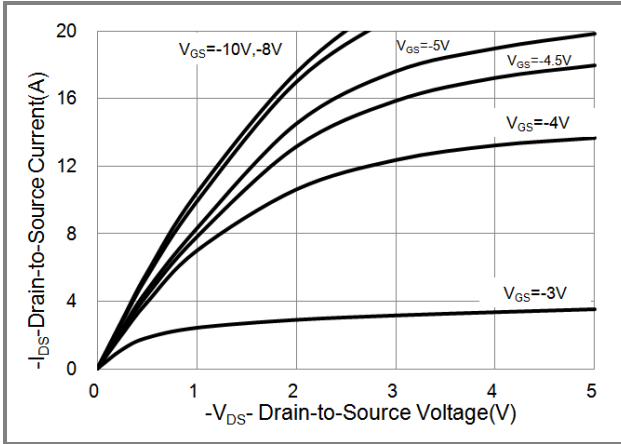


Fig.1 Output Characteristics

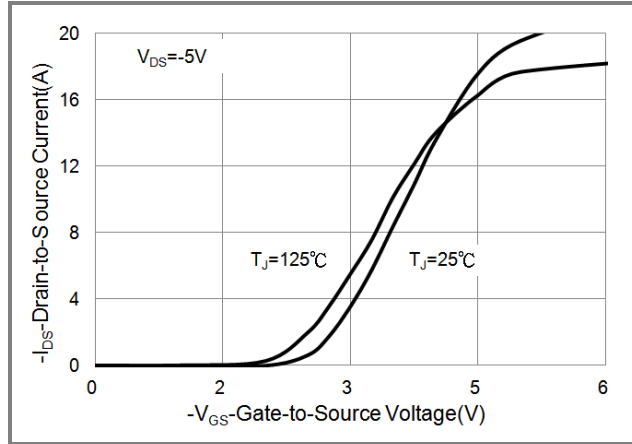


Fig.2 Transfer Characteristics

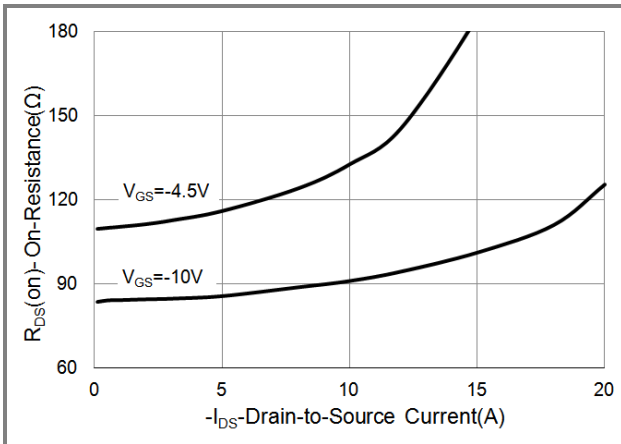


Fig.3 On-Resistance vs. Drain Current

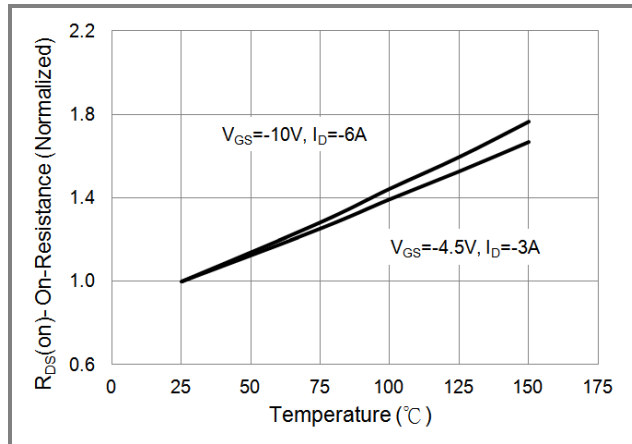


Fig.4 On-Resistance vs. Junction temperature

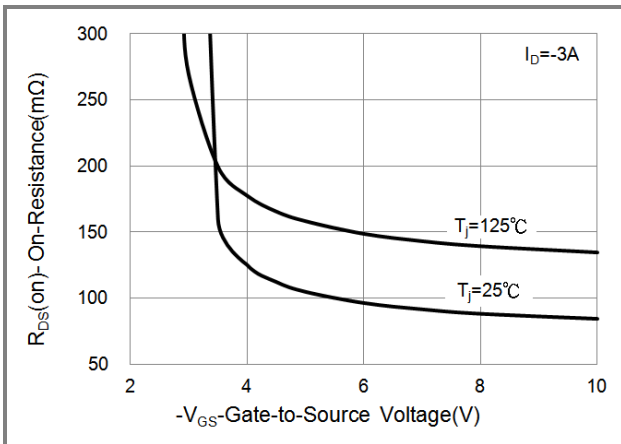


Fig.5 On-Resistance Variation with VGS.

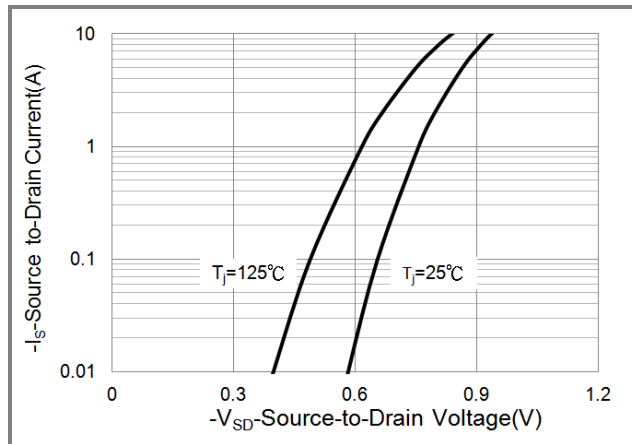


Fig.6 Source-Drain Diode Forward Voltage



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## TYPICAL CHARACTERISTIC CURVES

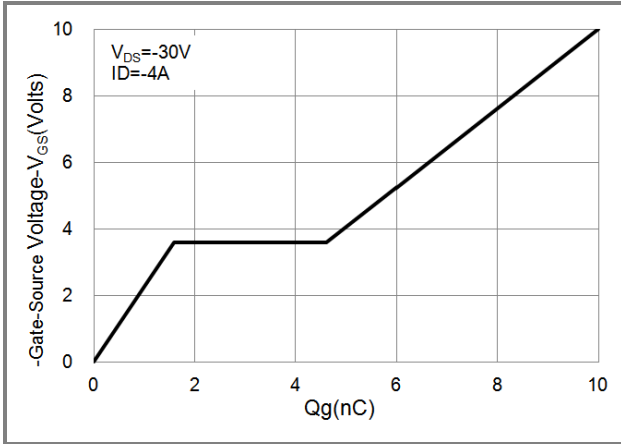


Fig.7 Gate-Charge Characteristics

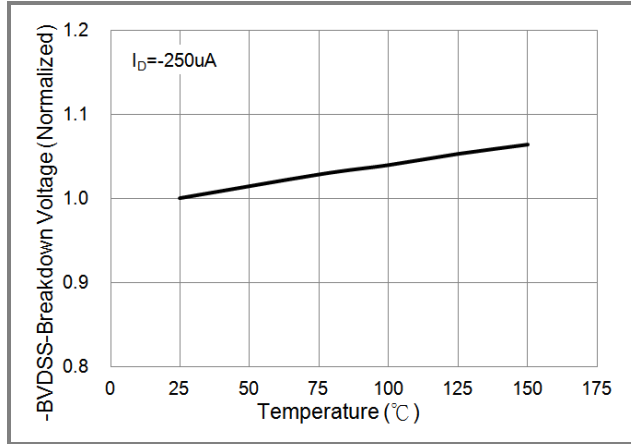


Fig.8 Breakdown Voltage Variation vs. Temperature

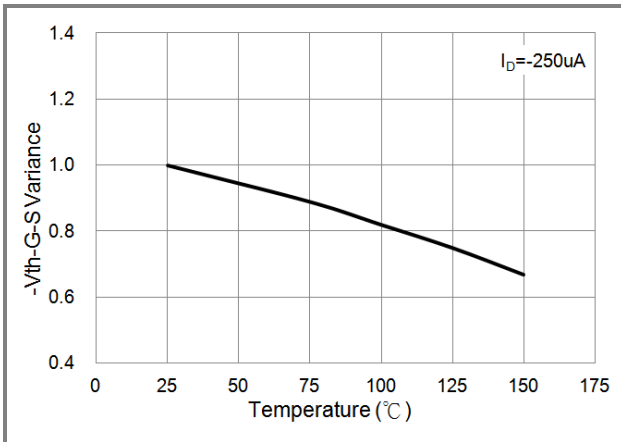


Fig.9 Threshold Voltage Variation with Temperature

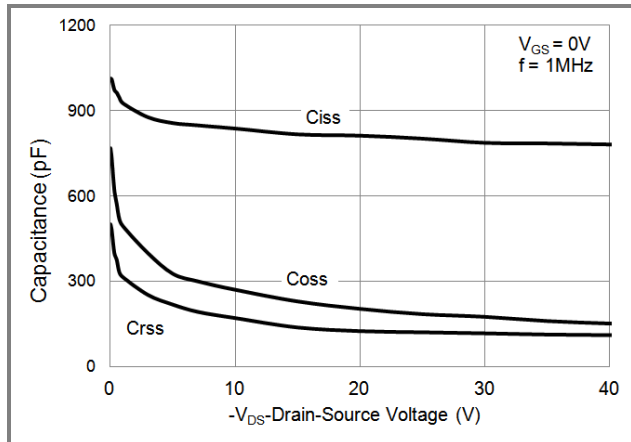


Fig.10 Capacitance vs. Drain-Source Voltage

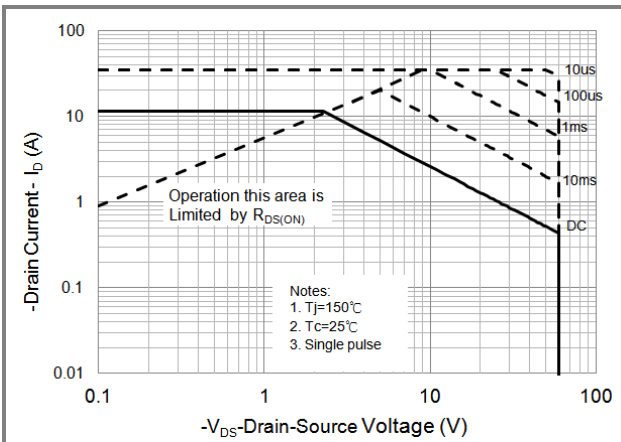


Fig.11 Maximum Safe Operating Area



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## TYPICAL CHARACTERISTIC CURVES

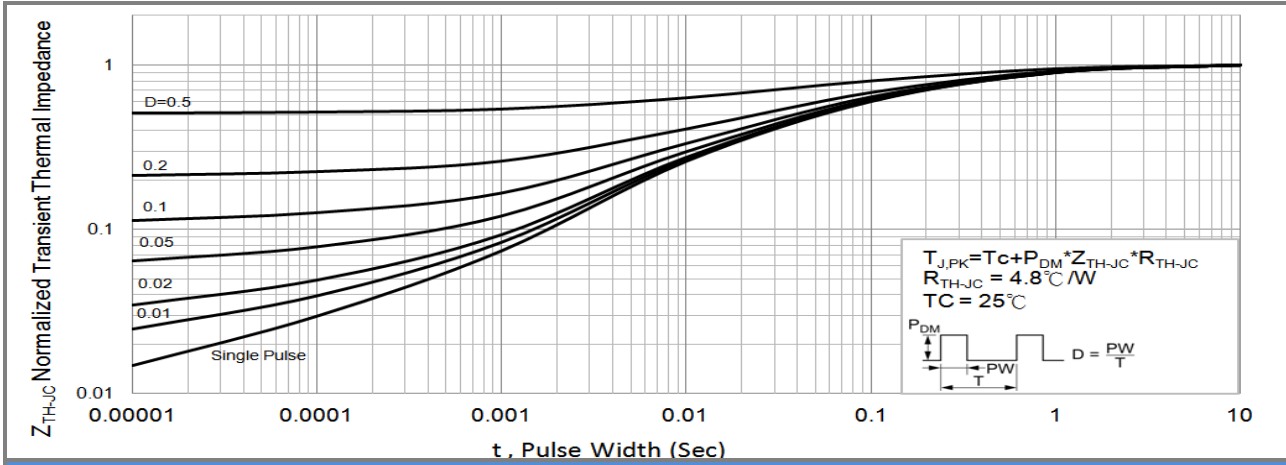


Fig.12 Normalized Transient Thermal Impedance vs. Pulse Width

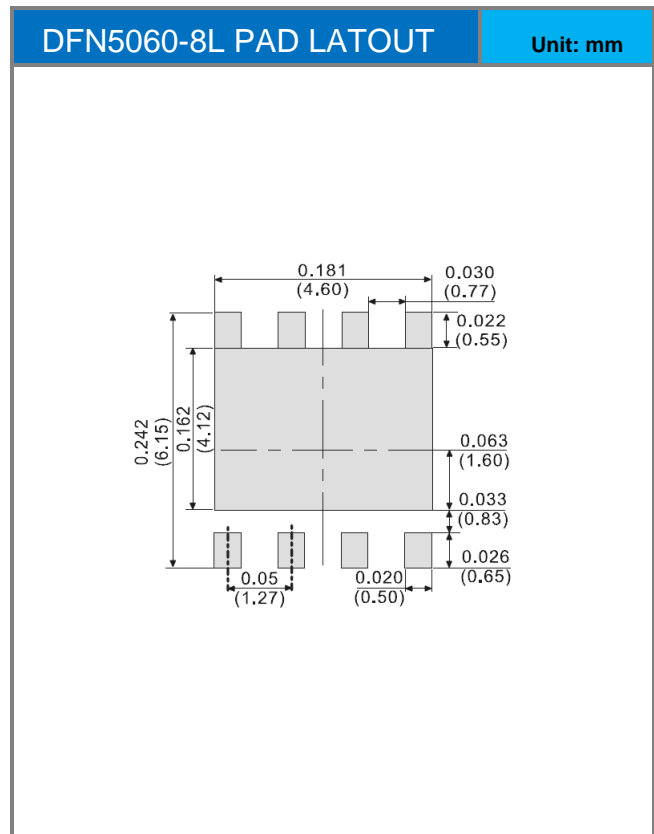
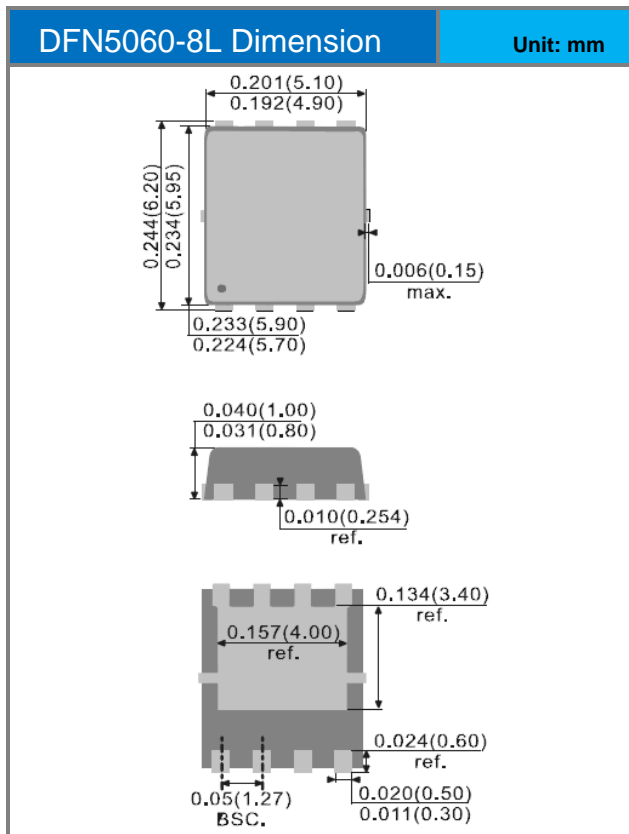


# PJQ5461A

## PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
PJQ5461A_R2_00001	DFN5060-8L	3000pcs / 13" reel	Q5461A	Halogen free

## Packaging Information & Mounting Pad Layout





## PJQ5461A

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