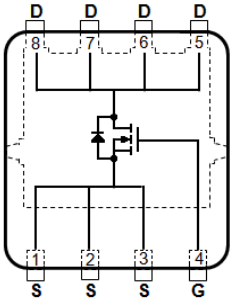
PJQ5540VC-AU

40V N-Channel Enhancement Mode MOSFET

Voltage	40 V	Current	246 A

DFN5060X-8L



Features

- $R_{DS(ON)}$, V_{GS}@10V, I_D@20A<1.38mΩ
- $R_{DS(ON)}$, V_{GS}@7V, I_D@20A<1.69mΩ
- Excellent FOM
- Standard Level Drive
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

Mechanical Data

- Case : DFN5060X-8L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.087 grams

Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current(Note 3)	T_C=25°C	I_D	246	A
	T_C=100°C		174	
Pulsed Drain Current(Note 1)	T_C=25°C	I_{DM}	735	
Power Dissipation	T_C=25°C	P_D	167	W
	T_C=100°C		83	
Continuous Drain Current(Note 4)	T_A=25°C	I_D	34	A
	T_A=70°C		29	
Power Dissipation	T_A=25°C	P_D	3.3	W
	T_A=70°C		2.3	
Single Pulse Avalanche Current(Note 5)		I_{AS}	32	A
Single Pulse Avalanche Energy(Note 5)		E_{AS}	265	mJ
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~175	°C
Thermal Resistance(Note 4)	Junction to Case	$R_{\theta JC}$	0.9	°C/W
	Junction to Ambient	$R_{\theta JA}$	45	

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Electrical Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	40	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=50uA	2	2.8	3.5	
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=20A	-	1.1	1.38	mΩ
		V_{GS}=7V, I_D=20A	-	1.3	1.69	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Dynamic(Note 6)						
Total Gate Charge	Q_g	V_{DS}=32V, I_D=20A, V_{GS}=10V	-	63	82	nC
Gate-Source Charge	Q_{gs}		-	19	-	
Gate-Drain Charge	Q_{gd}		-	11	-	
Input Capacitance	Ciss	V_{DS}=25V, V_{GS}=0V, f=1MHz	-	4691	6098	pF
Output Capacitance	Coss		-	979	1371	
Reverse Transfer Capacitance	Crss		-	80	140	
Gate resistance	R_g	f=1MHz	-	0.8	-	Ω
Turn-On Delay Time	$td_{(on)}$	V_{DS}=32V, I_D=20A, V_{GS}=10V, R_G=3Ω (Note 2)	-	30	-	ns
Turn-On Rise Time	t_r		-	34	-	
Turn-Off Delay Time	$td_{(off)}$		-	55	-	
Turn-Off Fall Time	t_f		-	17	-	
Drain-Source Diode						
Diode Forward Current	I_S	T_C=25°C	-	-	246	A
Pulsed Diode Forward Current	I_{SM}		-	-	735	
Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS}=0V	-	0.75	1.3	V
Reverse Recovery Time	Trr	V_{DD}=20V,V_{GS}=0V	-	50	-	ns
Reverse Recovery Charge	Qrr	I_S=20A,dI_S/dt=100A/us	-	54	-	nC

NOTES :

1. Pulse width≤100us, Duty cycle≤2%.
2. Essentially independent of operating temperature typical characteristics.
3. Chip capability with an $R_{\theta JC}$=0.9°C/W, Package limited 120A.
4. $R_{\theta JA}$ 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^2 with 2oz.square pad of copper.
5. E_{AS} is calculated based on the condition of L=1mH, I_{AS}=23A, V_{DD}=30V, V_{GS}=10V. 100% test at L=0.5mH, I_{AS}=32A in production.
6. Guaranteed by design, not subject to production testing.

PJQ5540VC-AU

TYPICAL CHARACTERISTIC CURVES

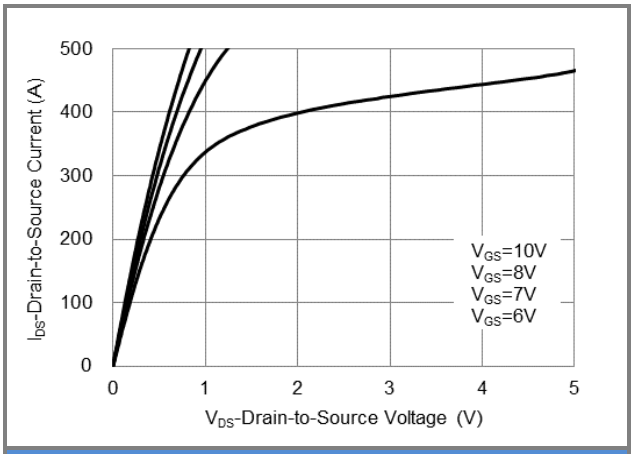

Fig.1 On-Region Characteristics

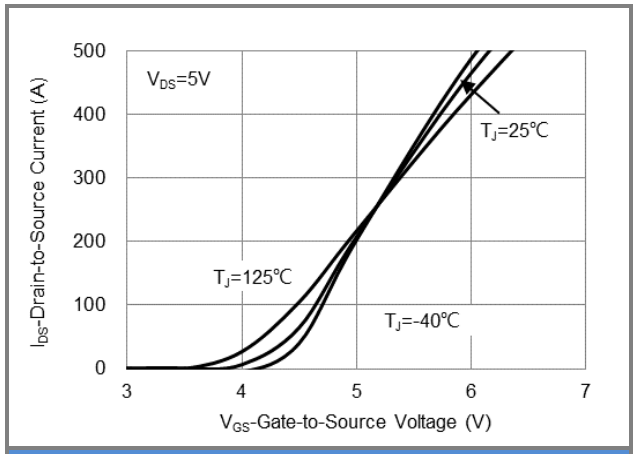

Fig.2 Transfer Characteristics

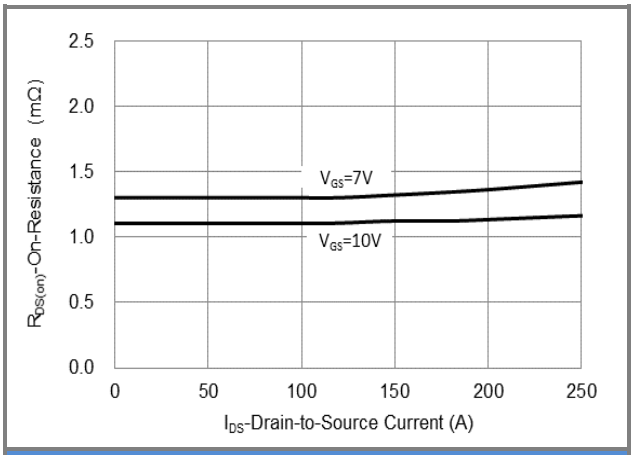

Fig.3 On-Resistance vs. Drain Current

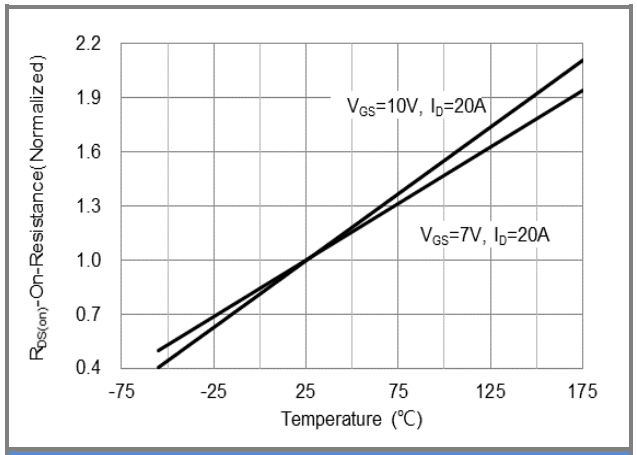

Fig.4 On-Resistance vs. Junction temperature

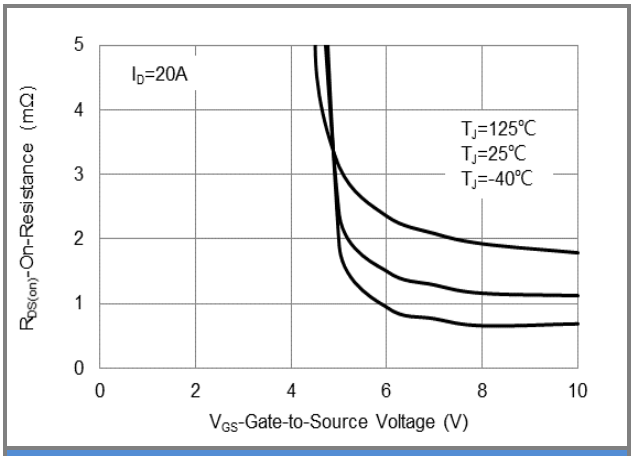

Fig.5 On-Resistance Variation with V_{GS}

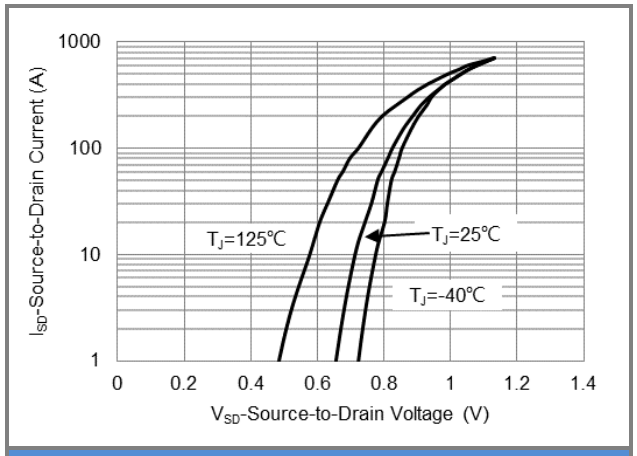

Fig.6 Source-Drain Diode Forward Voltage

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TYPICAL CHARACTERISTIC CURVES

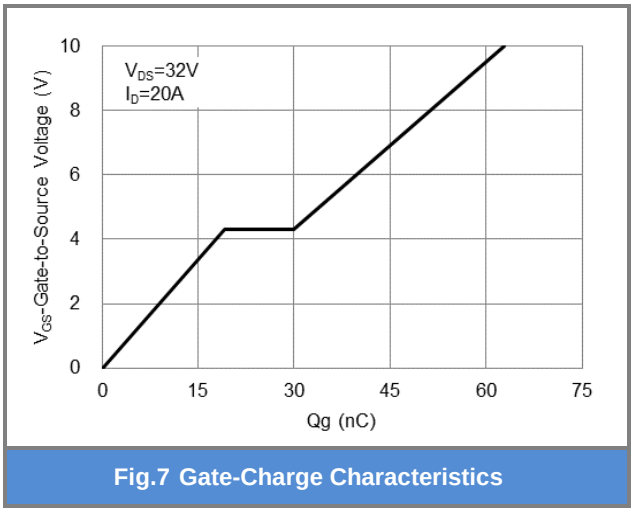


Fig.7 Gate-Charge Characteristics

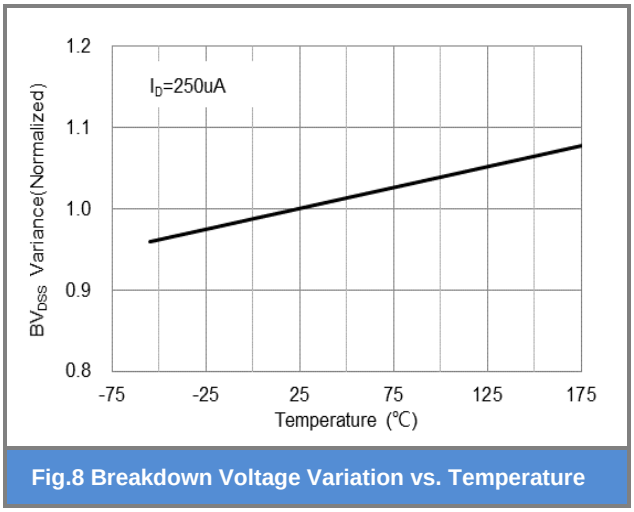


Fig.8 Breakdown Voltage Variation vs. Temperature

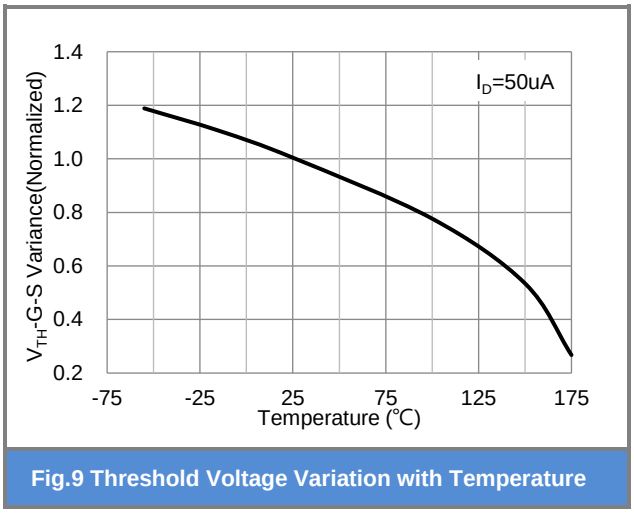


Fig.9 Threshold Voltage Variation with Temperature

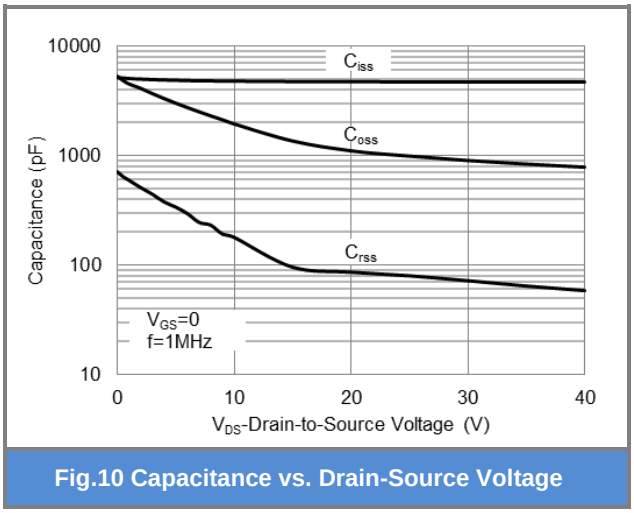


Fig.10 Capacitance vs. Drain-Source Voltage

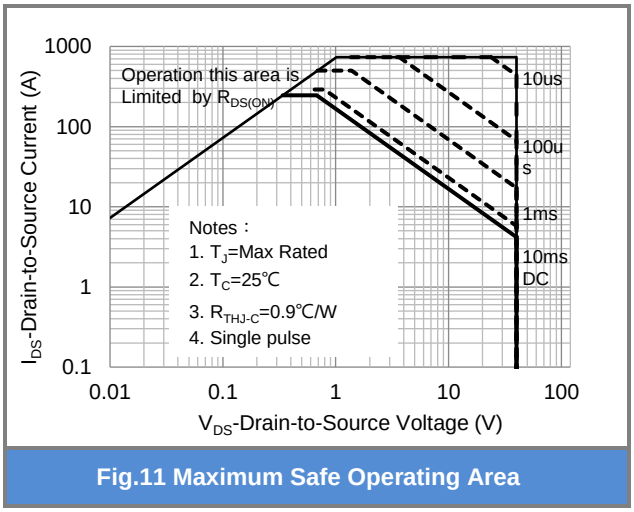


Fig.11 Maximum Safe Operating Area

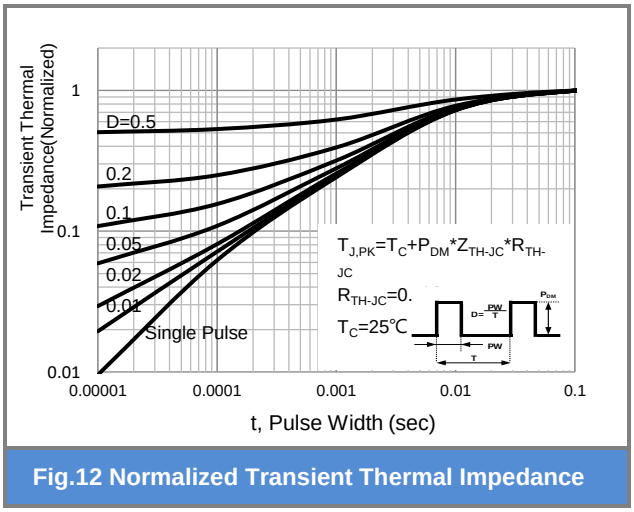


Fig.12 Normalized Transient Thermal Impedance

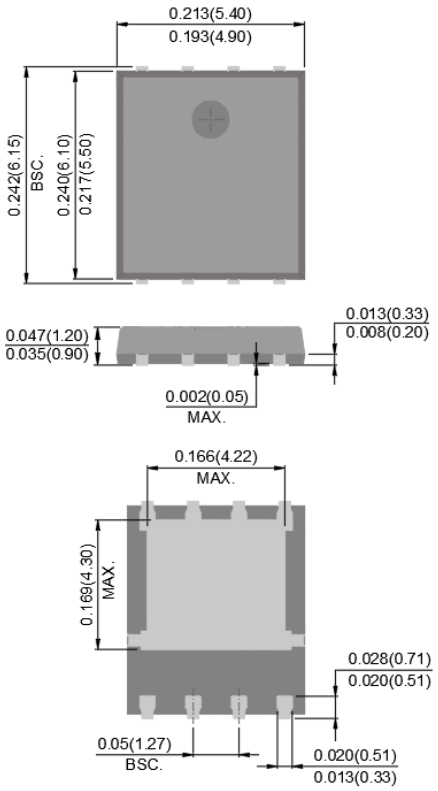
PJQ5540VC-AU

Product and Packing Information

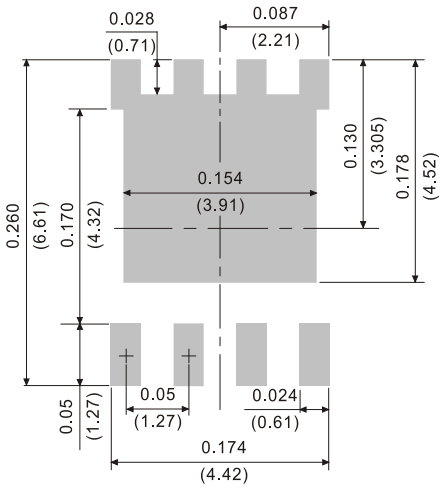
Part No.	Package Type	Packing Type	Marking
PJQ5540VC-AU	DFN5060X-8L	3K pcs / 13” reel	Q5540VC

Packaging Information & Mounting Pad Layout

DFN5060X-8L Dimension — Unit: inch(mm)



DFN5060X-8L Pad Layout — Unit: inch(mm)



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