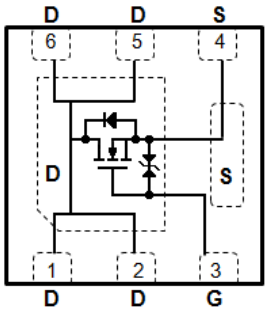
PJQ2414

20V N-Channel Enhancement Mode MOSFET – ESD Protected

Voltage	20 V	Current	8.6 A

DFN2020B-6L



Features

- $R_{DS(ON)}$, V_{GS}@4.5V, I_D@6.5A<17mΩ
- $R_{DS(ON)}$, V_{GS}@2.5V, I_D@5.5A<21mΩ
- $R_{DS(ON)}$, V_{GS}@1.8V, I_D@5.0A<34mΩ
- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application
- ESD Protected 2KV HBM
- 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

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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current(Note 4)		I_D	8.6	A
Pulsed Drain Current(Note 1)		I_{DM}	40	
Power Dissipation	T_A=25°C	P_D	1.9	W
	Derate above 25°C		15	mW/°C
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~150	°C
Typical Thermal Resistance - Junction to Ambient(Note 5)		$R_{\theta JA}$	65	°C/W

PJQ2414

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	20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	0.4	0.63	1.0	
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=6.5A	-	13.1	17	mΩ
		V_{GS}=2.5V, I_D=5.5A	-	16.7	21	
		V_{GS}=1.8V, I_D=5A	-	24.2	34	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V	-	-	±10	
Dynamic(Note 6)						
Total Gate Charge	Q_g	V_{DS}=16V, I_D=6.5A, V_{GS}=4.5V(Note 2,3)	-	7.6	-	nC
Gate-Source Charge	Q_{gs}		-	0.9	-	
Gate-Drain Charge	Q_{gd}		-	2.2	-	
Input Capacitance	Ciss	V_{DS}=10V, V_{GS}=0V, f=1MHZ	-	633	-	pF
Output Capacitance	Coss		-	106	-	
Reverse Transfer Capacitance	Crss		-	63	-	
Gate resistance	R_g	f=1.0MHZ	-	2.2	-	Ω
Turn-On Delay Time	$td_{(on)}$	V_{DS}=16V, I_D=6.5A, V_{GS}=4.5V, R_G=3Ω (Note 2,3)	-	6	-	ns
Turn-On Rise Time	t_r		-	112	-	
Turn-Off Delay Time	$td_{(off)}$		-	29	-	
Turn-Off Fall Time	t_f		-	254	-	
Drain-Source Diode						
Diode Forward Current	I_S	---	-	-	2.6	A
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V	-	0.73	1.0	V

Notes：

1.Pulse width<300us, Duty cycle<2%.

2.Essentially independent of operating temperature typical characteristics.

3.Repetitive rating, pulse width limited by junction temperature T_J(MAX)=150℃.Ratings are based on low frequency and duty cycles to keep initial T_J =25℃.

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 $inch^2$ with 2oz.square pad of copper.

6.Guaranteed by design, not subject to production testing.

PJQ2414

TYPICAL CHARACTERISTIC CURVES

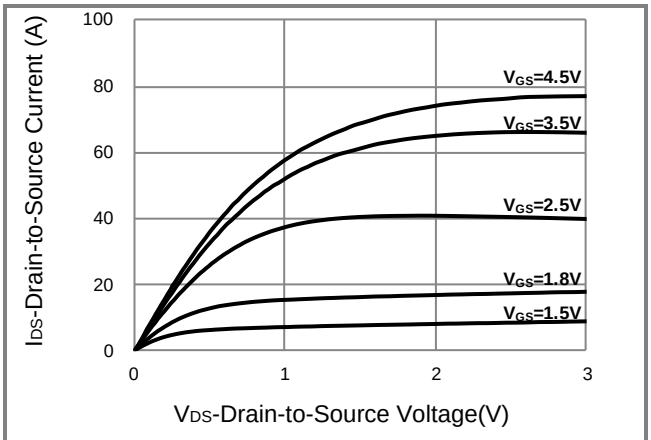


Fig.1 Output Characteristics

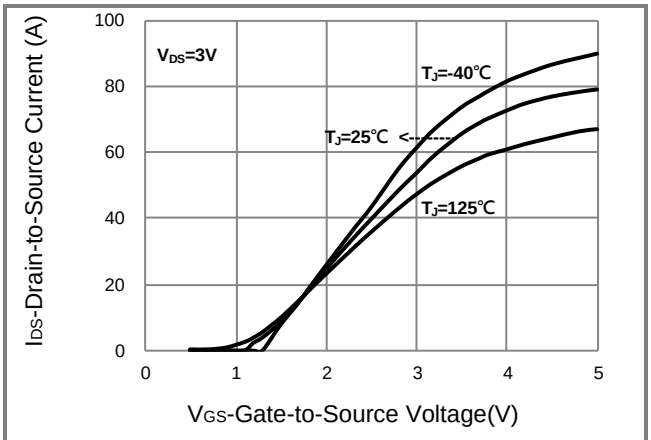


Fig.2 Transfer Characteristics

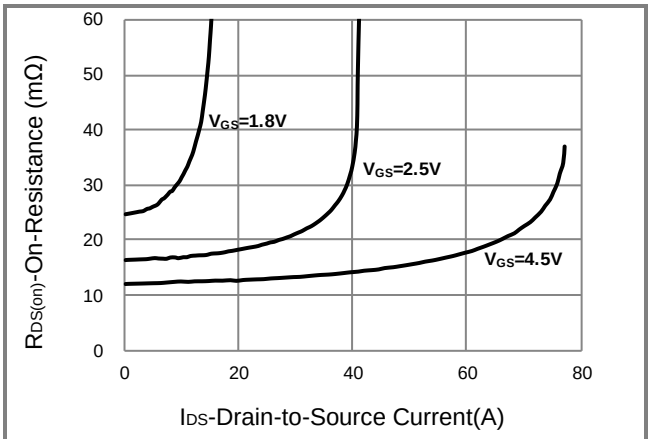


Fig.3 On-Resistance vs. Drain Current

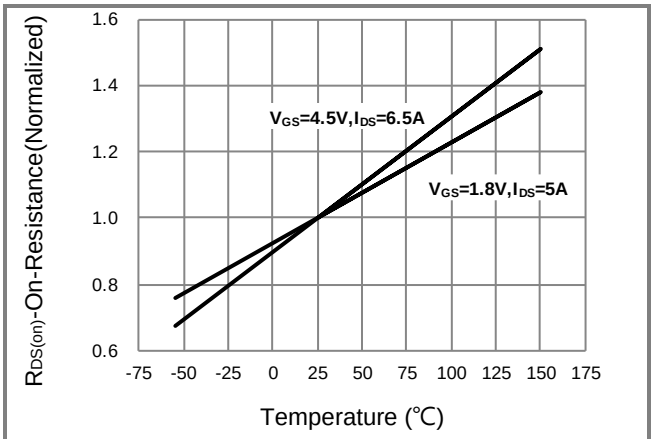


Fig.4 On-Resistance vs. Junction temperature

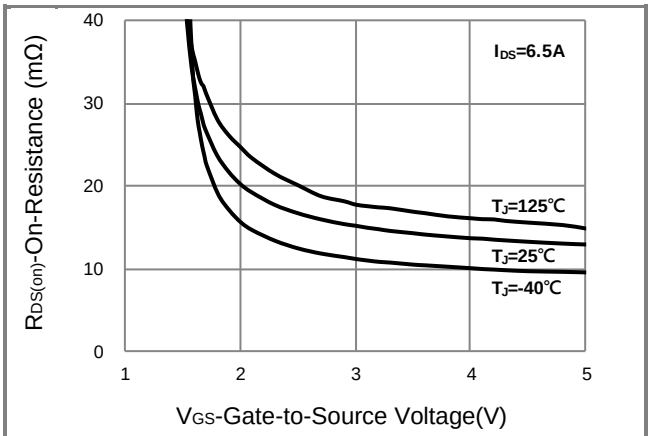


Fig.5 On-Resistance Variation with V_{GS}

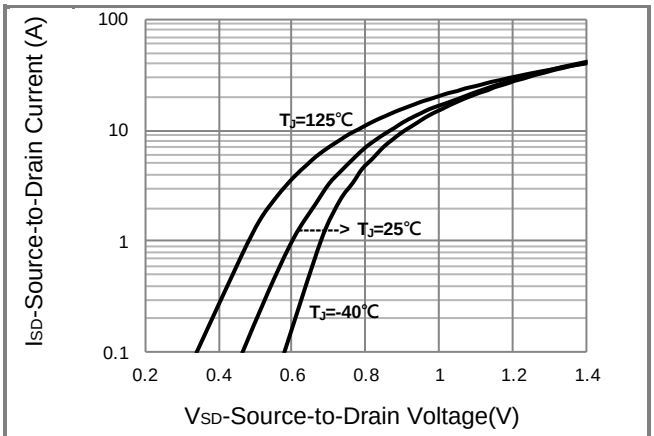


Fig.6 Body Diode Characteristics

PJQ2414

TYPICAL CHARACTERISTIC CURVES

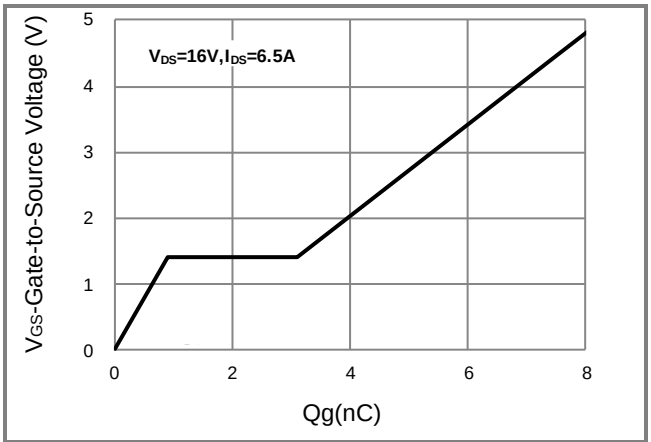


Fig.7 Gate-Charge Characteristics

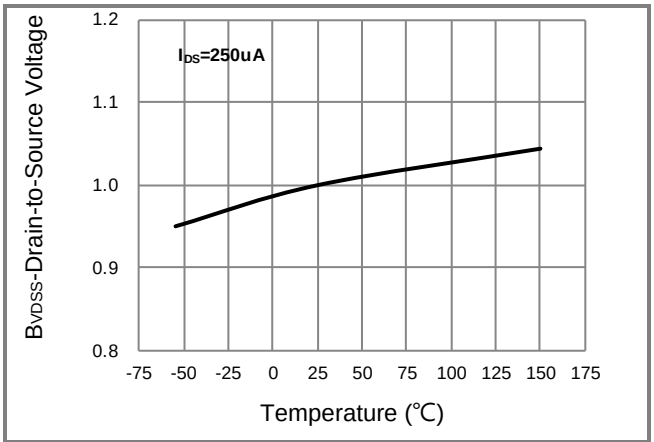


Fig.8 Breakdown Voltage Variation vs. Temperature

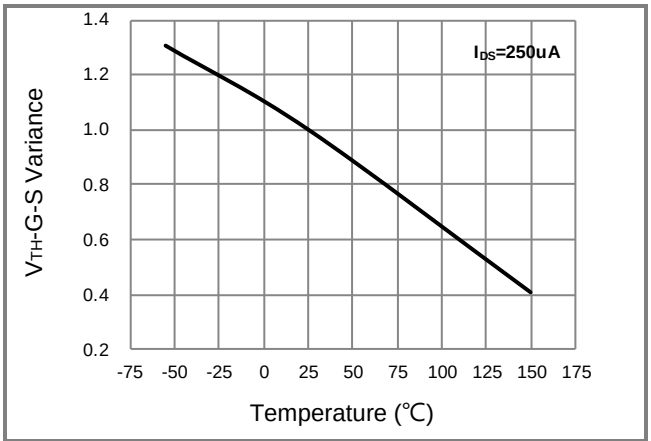


Fig.9 Threshold Voltage Variation with Temperature

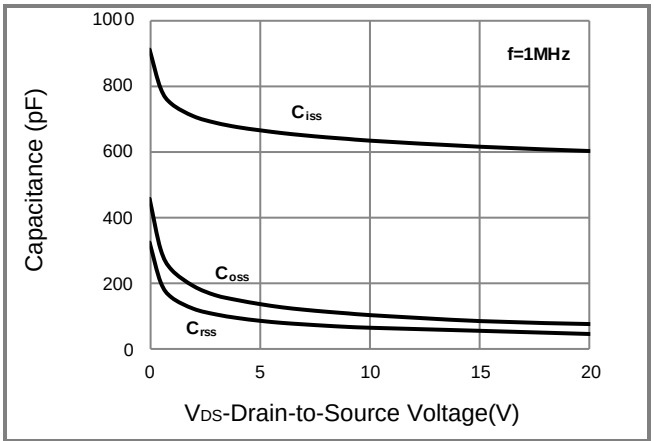


Fig.10 Capacitance vs. Drain-Source Voltage

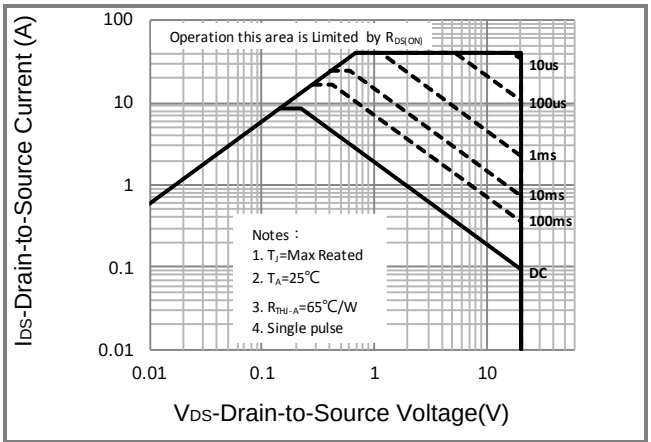


Fig.11 Maximum Safe Operating Area

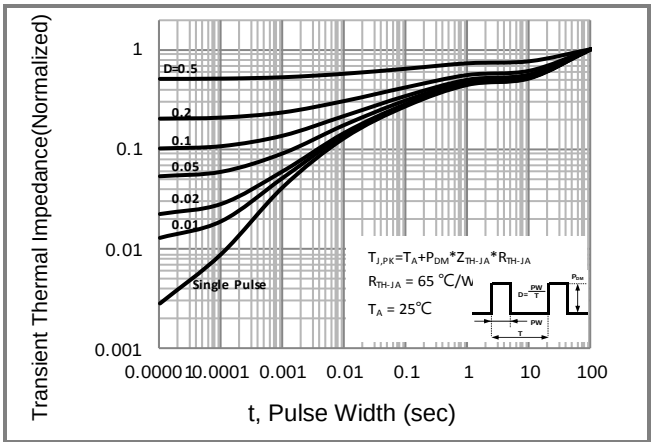


Fig.12 Normalized Transient Thermal Impedance

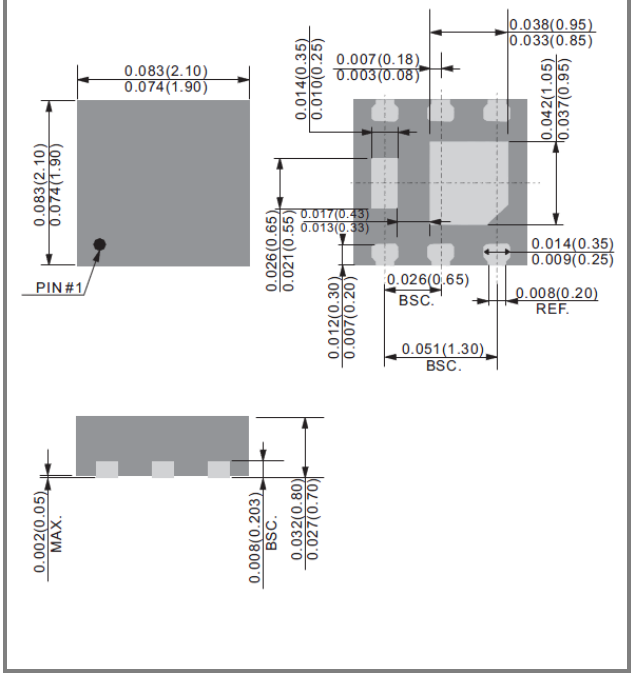
PJQ2414

Part No. Packing Code Version

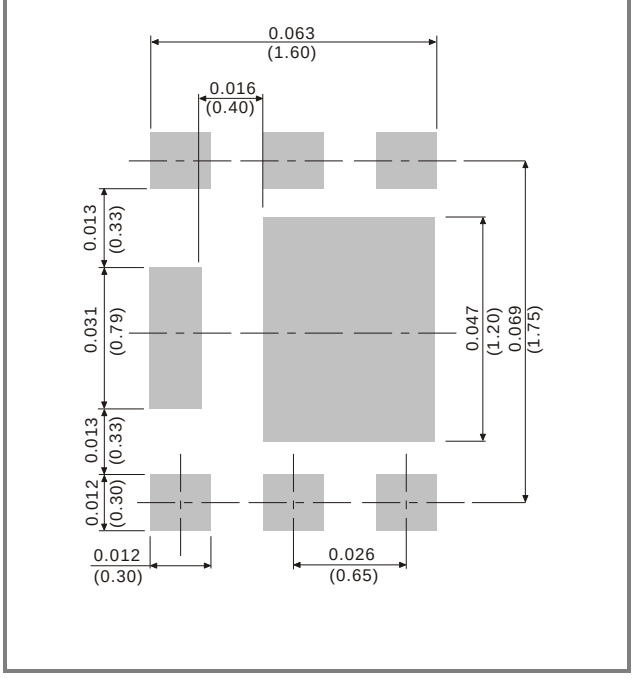
Part No. Packing Code	Package Type	Packing Type	Marking	Version
PJQ2414_R1_00201	DFN2020B-6L	3K pcs / 7” reel	414	Halogen free RoHS compliant

Packaging Information & Mounting Pad Layout

DFN2020B-6L Dimension — Unit: inch(mm)



DFN2020B-6L Pad Layout — Unit: inch(mm)



PJQ2414

Disclaimer

- Reproducing and modifying information of the document is prohibited without permission from Panjit International Inc..
- Panjit International Inc. reserves the rights to make changes of the content herein the document anytime without notification. Please refer to our website for the latest document.
- Panjit International Inc. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- Panjit International Inc. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. Panjit International Inc. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Panjit International Inc. for any damages resulting from such improper use or sale.
- Since Panjit uses lot number as the tracking base, please provide the lot number for tracking when complaining.