

BRCS4614YAQ

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Rev.A May.-2023



DATA SHEET

Parameter	Symbol	Rating		Unit
		N-channe	P-channell	
Drain-Source Voltage	V_{DSS}	± 40		V
Gate-Source Voltage	V_{GSS}	± 20		V
Continuous Drain Current	$I_D (T_C=25^\circ C)$	17	-12	A

N- /N-CHANNEL Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=250\mu A$	40	45		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V$ $V_{GS}=0V$			1.0	μA
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	1	1.8	3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=6.0A$		18	25	m
		$V_{GS}=4.5V$ $I_D=5.0A$		24	35	m
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=1.0A$			1.2	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		1200		pF
Output Capacitance	C_{oss}			350		pF
Reverse Transfer Capacitance	C_{rss}			250		pF
Gate resistance	R_g	$V_{DS}=0V$ $f=1.0MHz$ $V_{GS}=0V$		2.5		
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10V$ $V_{DS}=20V$ $I_D=6A$		9.2		nC
Total Gate Charge	$Q_{g(4.5V)}$			4.5		
Gate-Source Charge	Q_{gs}			2.5		nC
Gate-Drain Charge	Q_{gd}			1.5		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=20V$ $V_{GS}=10V$ $R_L=3.3$ $R_{GEN}=3$		6.5		ns
Turn-On Rise Time	t_r			3.7		ns
Turn-Off Delay Time	$t_{d(off)}$			18.2		ns
Turn-Off Fall Time	t_f			7.1		ns

N- / N-CHANNEL Electrical Characteristic Curve

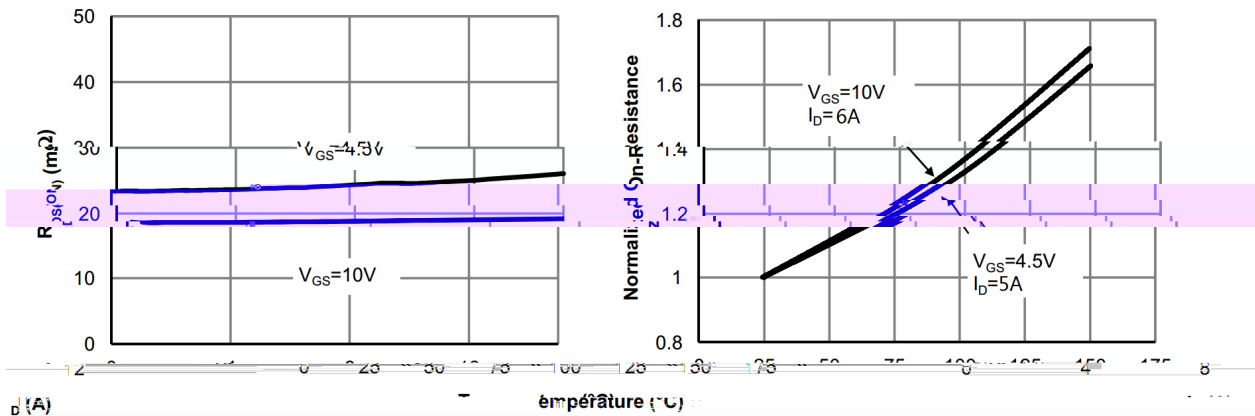
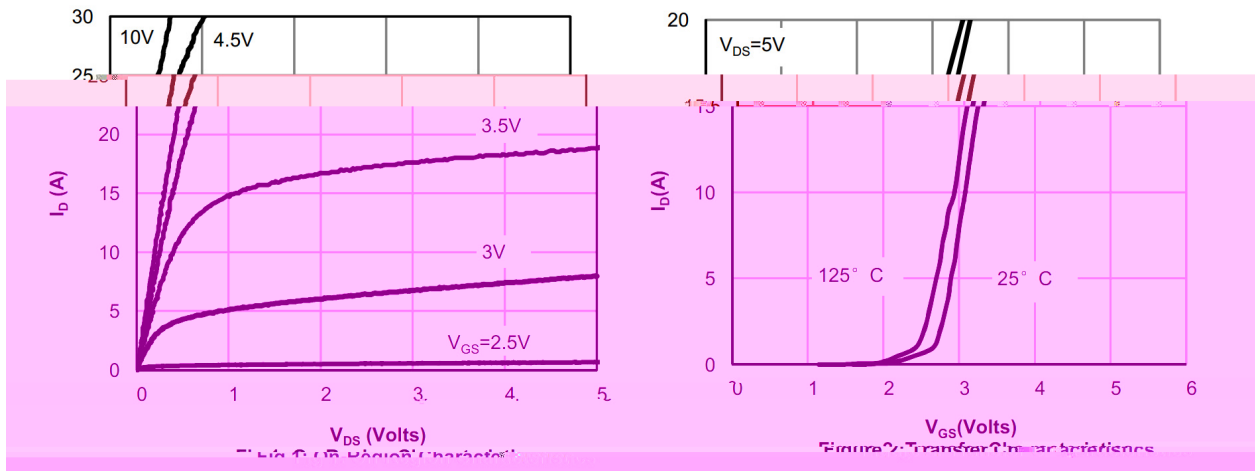


Figure 3: On-Resistance vs. Drain Current and Gate Voltage
Figure 4: On-Resistance vs. Junction Temperature

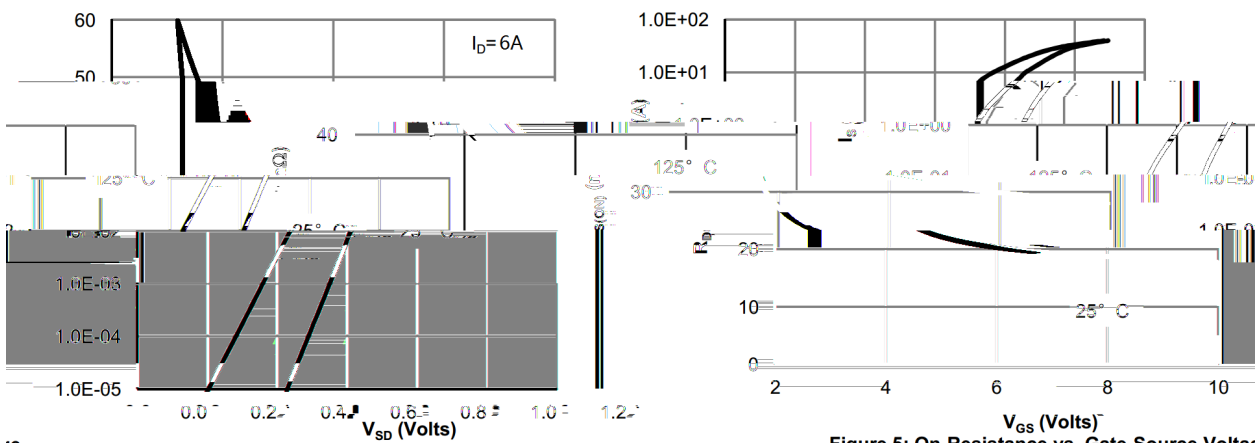
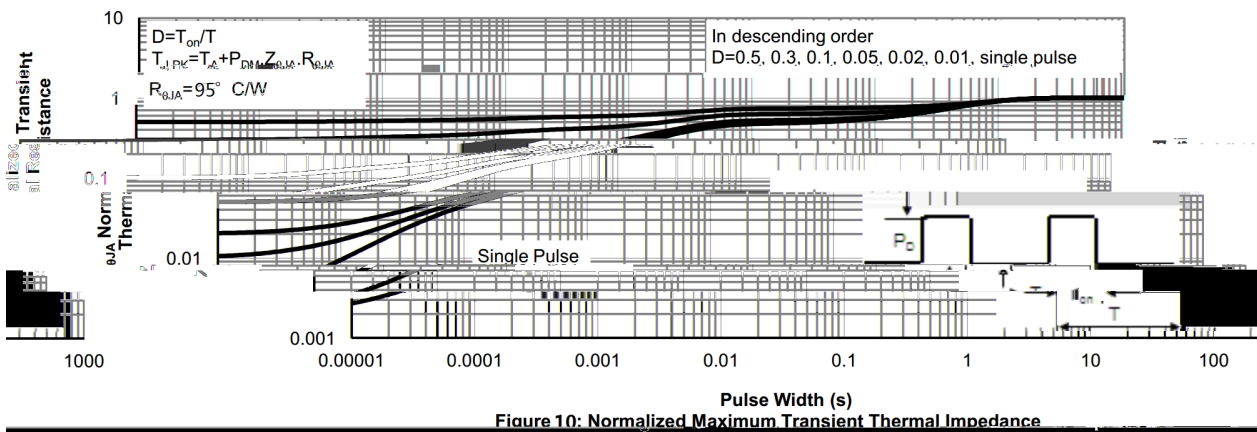
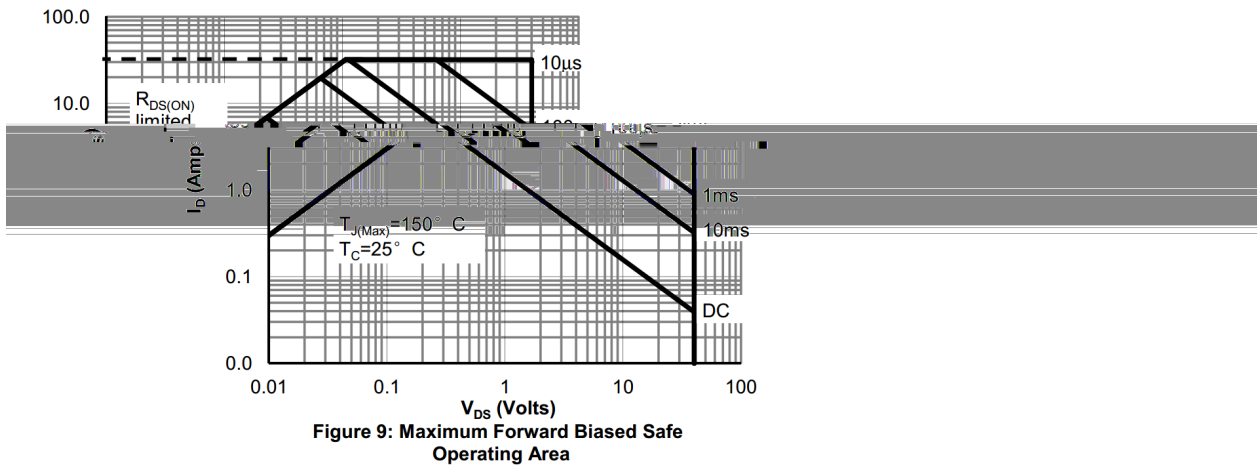
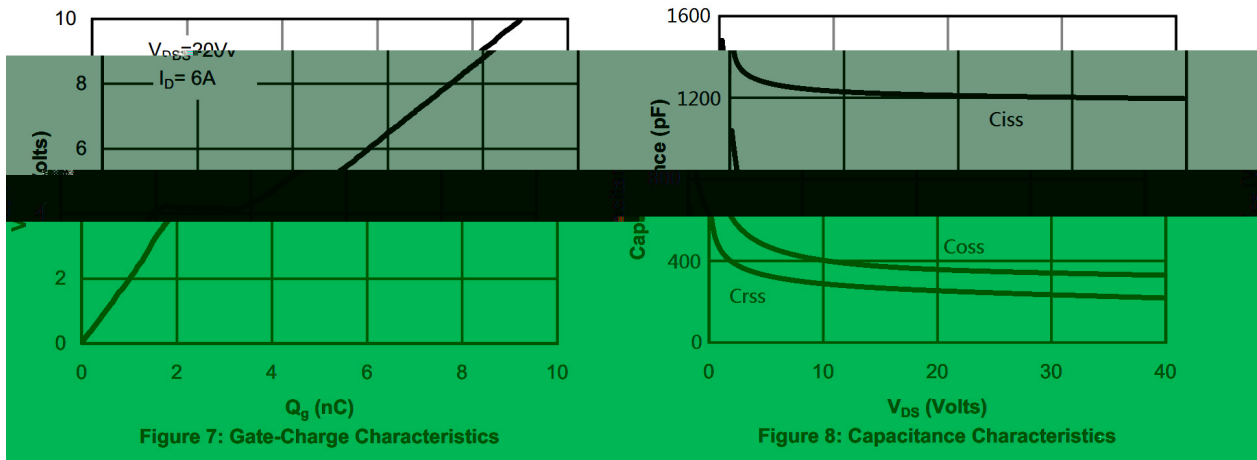


Figure 5: On-Resistance vs. Gate-Source Voltage
Figure 6: Body Diode Characteristics

N- / N-CHANNEL Electrical Characteristic Curve



P- /P-CHANNEL Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-40	-46		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-40V$ $V_{GS}=0V$			-1.0	μA
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-1.0	-1.4	-3.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V$ $I_D=-5.0A$		32	45	m
		$V_{GS}=-4.5V$ $I_D=-2.0A$		40	60	m
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=-1.0A$			-1.2	V
Input Capacitance	C_{iss}	$V_{DS}=-25V$ $V_{GS}=0V$ $f=1.0MHz$		1000		pF
Output Capacitance	C_{oss}			90		pF
Reverse Transfer Capacitance	C_{rss}			70		pF
Gate resistance	R_g	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$		10		
Total Gate Charge	$Q_{g(-10V)}$	$V_{GS}=-10V$ $V_{DS}=-20V$ $I_D=-5A$		17.5		nC
Total Gate Charge	$Q_{g(-4.5V)}$			8.2		
Gate-Source Charge	Q_{gs}			3.5		nC
Gate-Drain Charge	Q_{gd}			3.3		nC
Turn-On Delay Time	$t_{d(on)}$				6.3	
Turn-On Rise Time	t_r	$V_{DS}=-20V$ $V_{GS}=-10V$ $R_L=4$ $R_{GEN}=3$		8.5		ns
Turn-Off Delay Time	$t_{d(off)}$			45.2		ns
Turn-Off Fall Time	t_f			43.4		ns

P- / P-CHANNEL Electrical Characteristic Curve

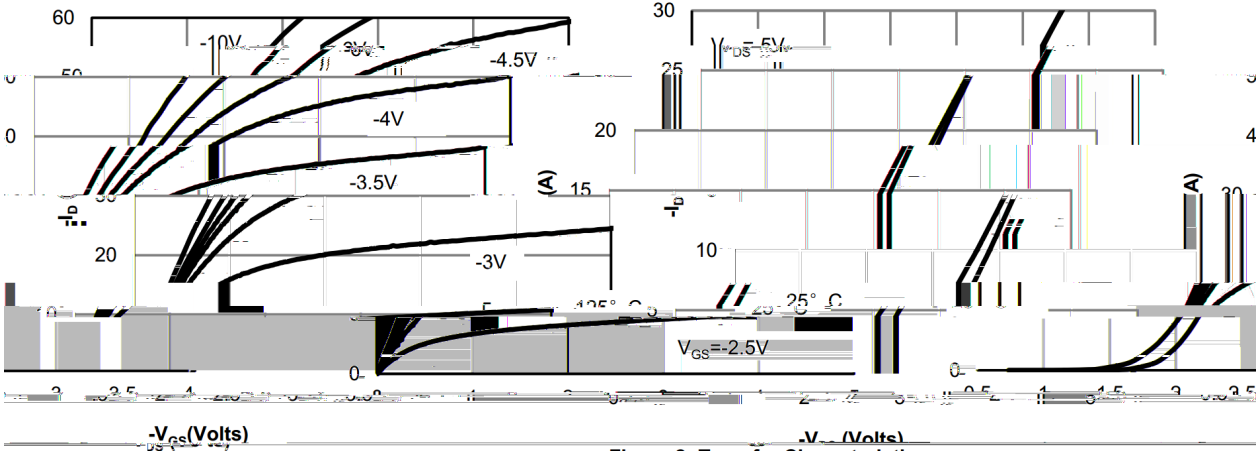


Figure 1: On-Region Characteristics

Figure 2: Transfer Characteristics

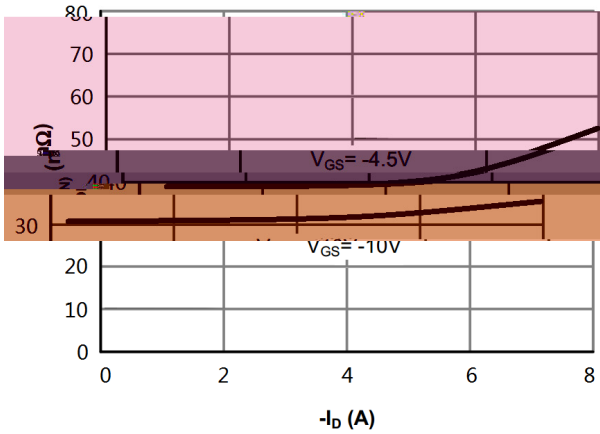


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

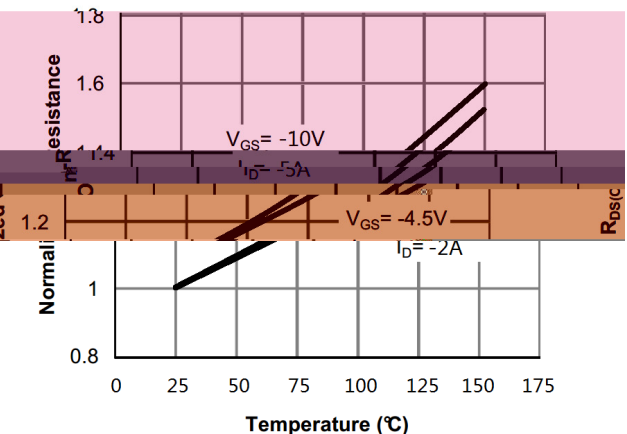


Figure 4: On-Resistance vs. Junction Temperature

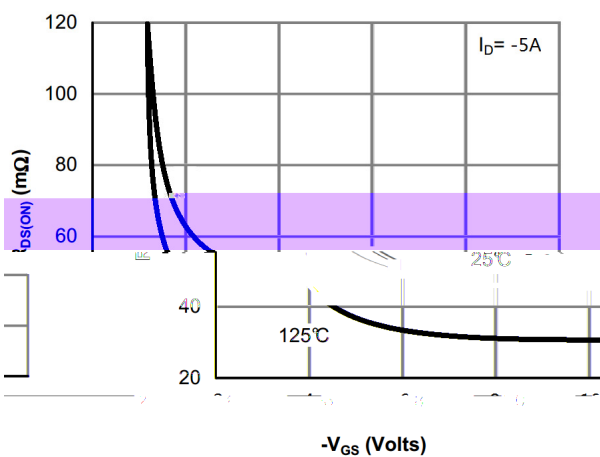


Figure 5: On-Resistance vs. Gate-Source Voltage

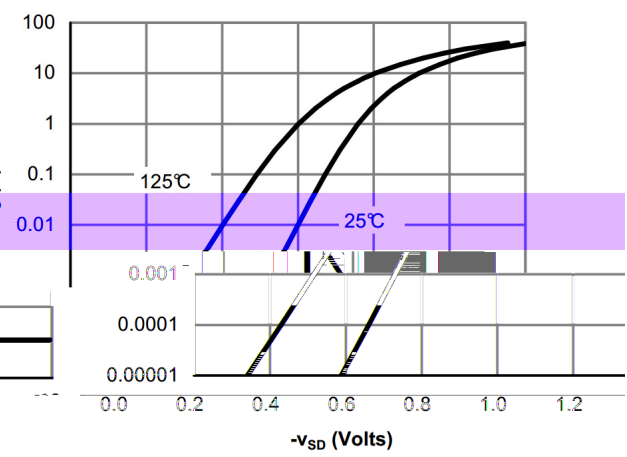


Figure 6: Body-Diode Characteristics

P- / P-CHANNEL Electrical Characteristic Curve

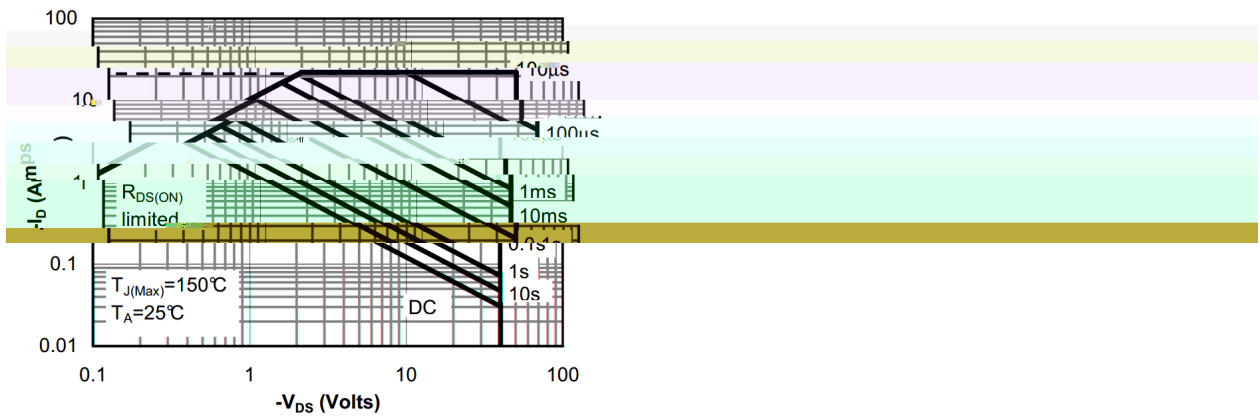
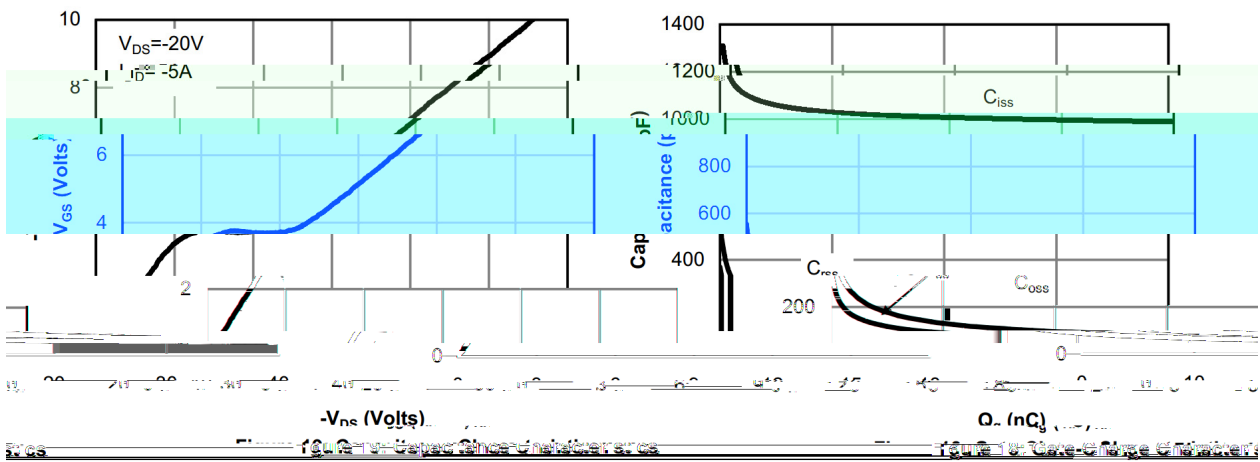


Figure 10: Maximum Forward-Biased Safe Operating Area

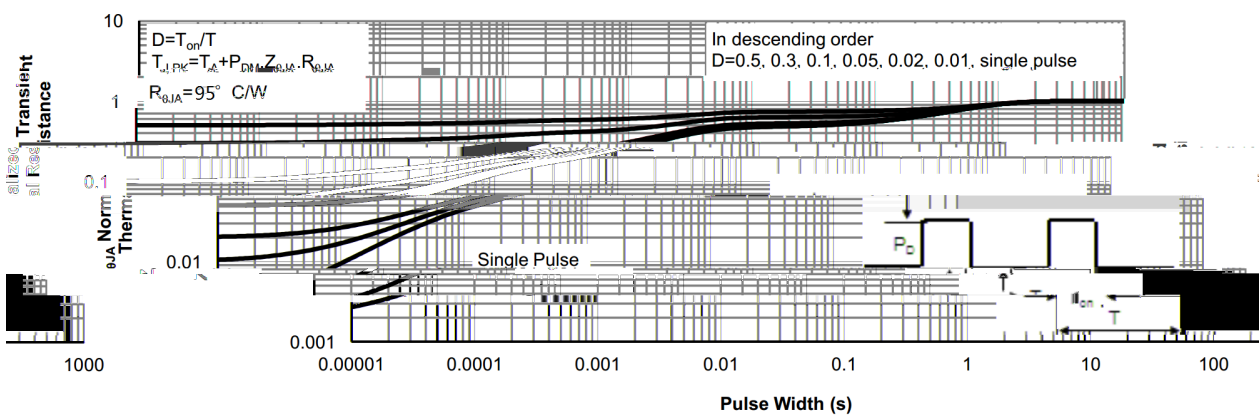
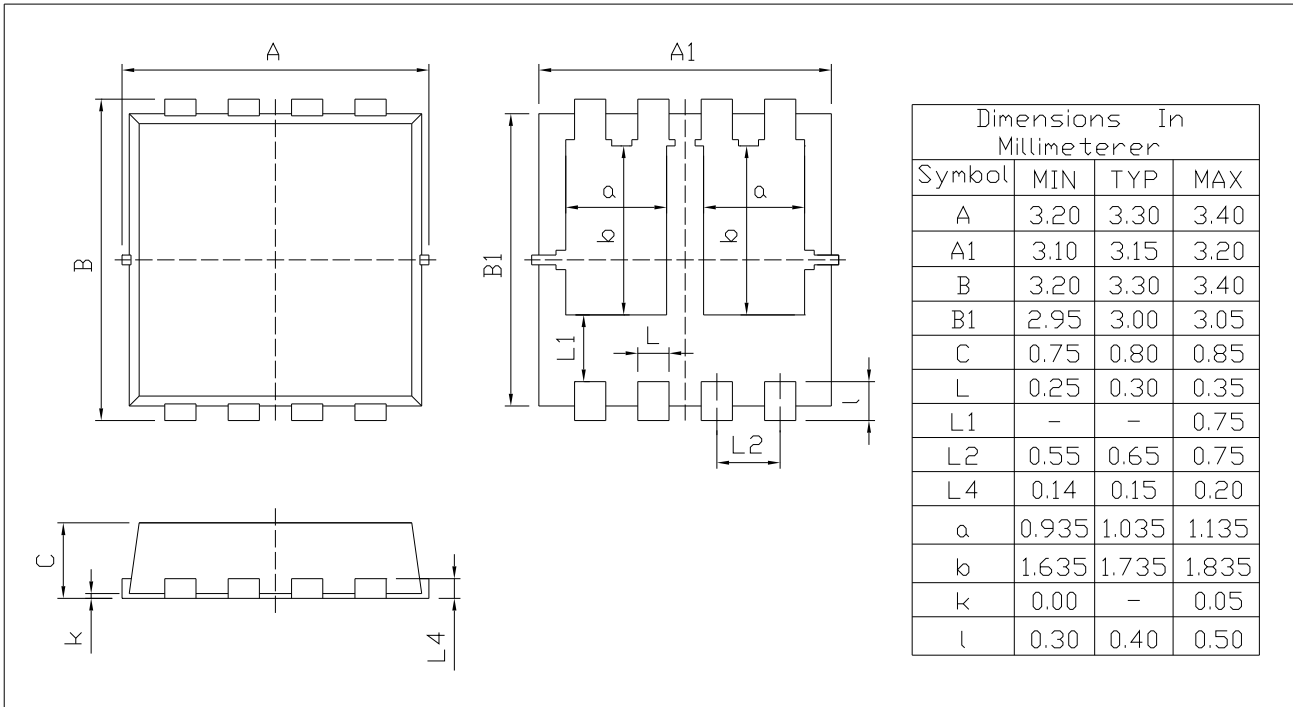


Figure 11: Normalized Maximum Transient Thermal Impedance

/ Package Dimensions

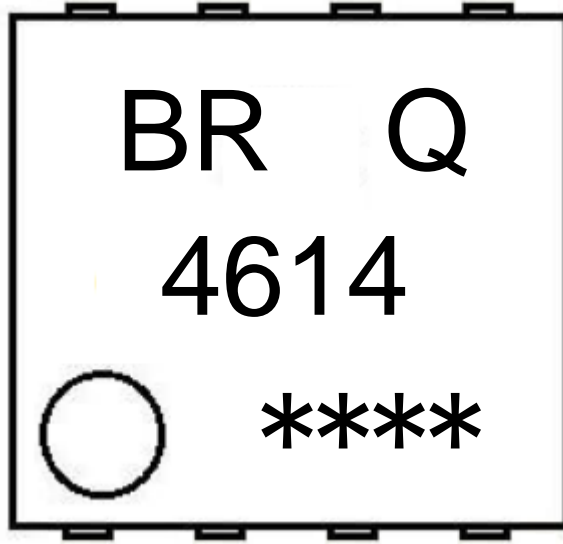
PDFN3X3-8L

Unit:mm



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/ Marking Instructions



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Note:

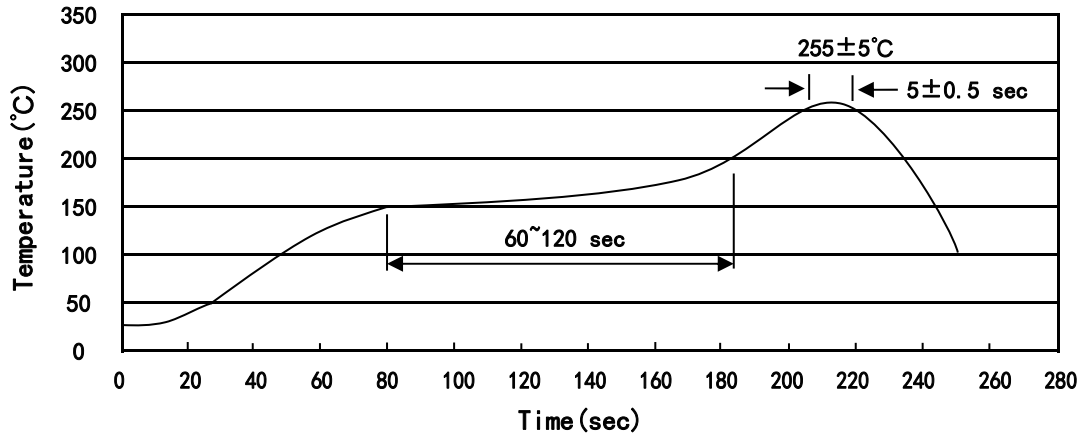
BR: Company Code

Q: Automobile halogen-free product Code

4614: Product Type Code

****: Lot No. Code, code change with Lot No

() / Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

- 1 150 200 60 120sec; 1.Preheating:150~200 , Time:60~120sec.
- 2 255±5 5±0.5sec; 2.Peak Temp.:255±5 , Duration:5±0.5sec.
- 3 2 10 /sec. 3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

260±5 10±1 sec. Temp.:260±5 Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type	Units					Dimension (unit mm ³)		
PDFN3x3-8L	5,000	2	10,000	6	60,000	13" x12	360x360x50	380x335x366

/ Notices