

BRCS020N04ZC

Rev.B Feb.-2024



DATA SHEET

/ Descriptions

PDFN5×6 N
N-Channel MOSFET in a PDFN5×6 Plastic Package.

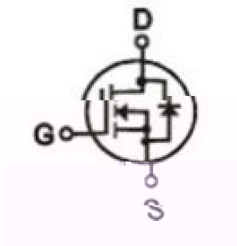
/ Features

Low $R_{DS(ON)}$ to minimize conductive loss;low Gate Charge for fast switching;Low Thermal resistance;HF Product.

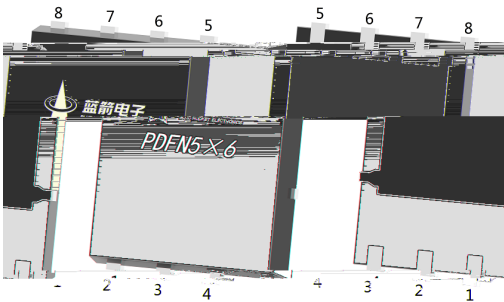
/ Applications

MB/NB/UMPC/VGA Buck -
Battery Management,High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA,Networking DC-DC Power System,Load Switch.

/ Equivalent Circuit



/ Pinning



PIN1 2 3 S PIN4 G PIN5 6 7 8 D

Pin	极性
1	S
2	S
3	S
4	G
5	D
6	D
7	D
8	D

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings($T_a=25^\circ\text{C}$)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DS}	40	V
Drain Current - Continuous		I _D	100	A
Drain Current – Pulsed		I _{DM}	285	A
Gate-Source Voltage		V _{GS}	20	V
Power Dissipation		P _D (T _c =25 °C)	78	W
Single Pulse Avalanche Energy(L=0.5mH)		E _{AS}	220	mJ
Avalanche Current(L=0.5mH)		I _{AS}	33.2	A
Junction and Storage Temperature Range		T _j , T _{stg}	-55 to 150	
Thermal resistance, junction - ambient	t ≤ 10s	R _{JA}	20	/ W
	Steady-State		50	
Thermal resistance, junction - case	Steady-State	R _{JC}	1.6	

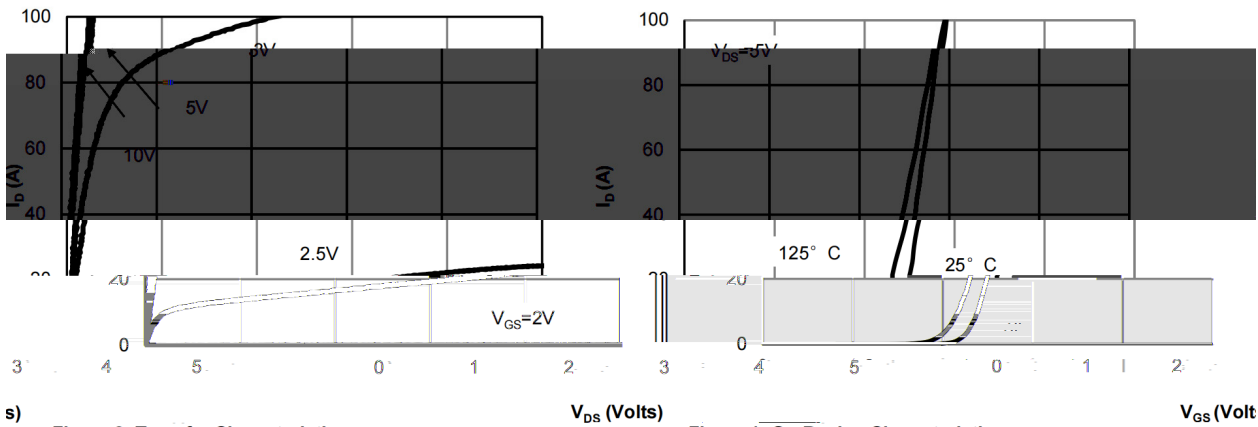
/ Electrical Characteristics($T_a=25^\circ\text{C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	40	44		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40\text{V}, V_{GS}=0\text{V}$			1	μA
Gate-Body leakage current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.5	1.7	3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=20\text{A}$		1.8	2.0	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}, I_D=10\text{A}$		2.4	4.0	
Diode Forward Voltage	V_{SD}	$I_S=1\text{A}, V_{GS}=0\text{V}$			1.2	V
Input Capacitance	C_{iss}	$V_{DS}=25\text{V}, V_{GS}=0\text{V}$ $f=1.0\text{MHz}$		10850		pF
Output Capacitance	C_{oss}			830		
Reverse Transfer Capacitance	C_{rss}			750		
Gate resistance	R_g	$V_{GS}=0\text{V}, V_{DS}=0\text{V}$ $f=1\text{MHz}$		1.5		Ω
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10\text{V}, V_{DS}=20\text{V}$ $I_D=20\text{A}$		50		nC
Total Gate Charge	$Q_{g(4.5V)}$			22		
Gate Source Charge	Q_{gs}			11.5		
Gate Drain Charge	Q_{gd}			4		

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	t _{d(on)}	V _{GS} =10V V _{DS} =20V R _L =1.0 R _{GEN} =3		11		ns
Turn-On Rise Time	t _r			3.5		
Turn-Off Delay Time	t _{d(off)}			36		
Turn-Off Fall Time	t _f			3		

/ Electrical Characteristic Curve



s) Figure 2: Transfer Characteristics

Figure 1: On-Region Characteristics

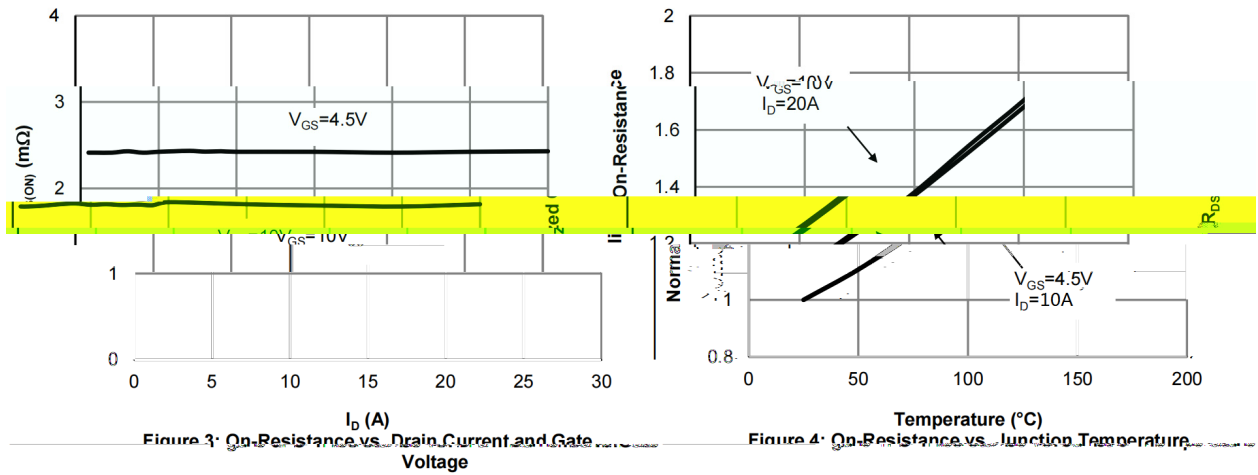


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

Figure 4: On-Resistance vs. Junction Temperature

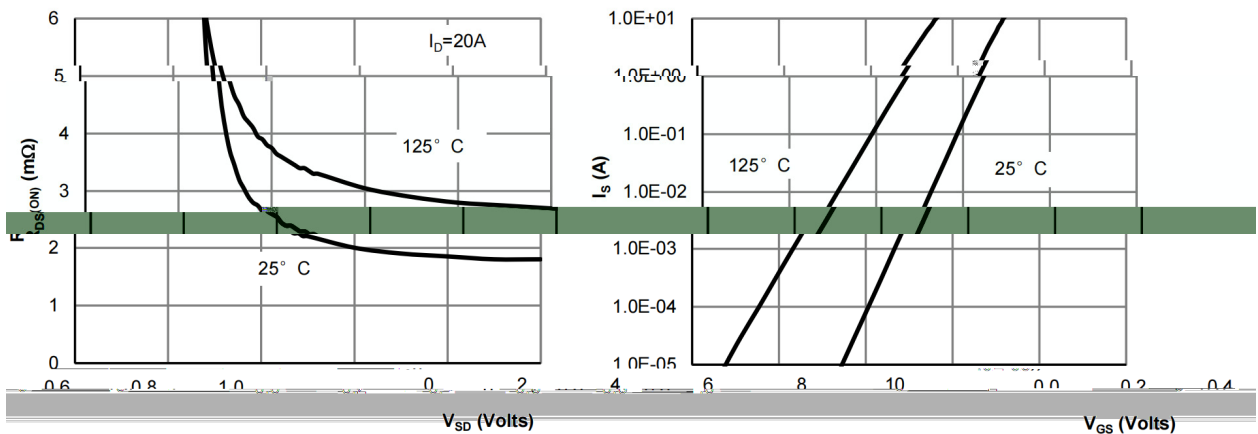


Figure 5: On-Resistance vs. Drain Current and Gate Voltage

Figure 6: Body Diode Characteristics

/ Electrical Characteristic Curve

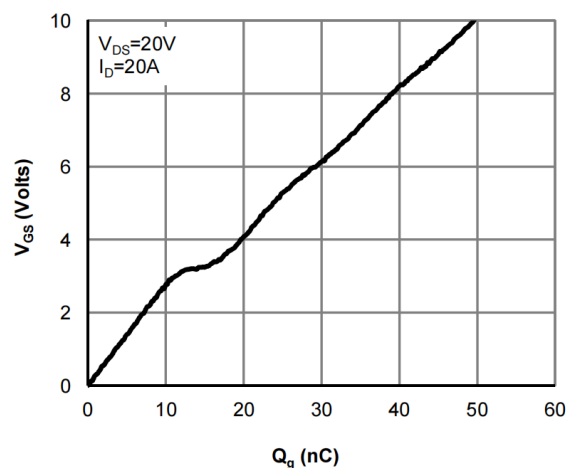


Figure 7: Gate-Charge Characteristics

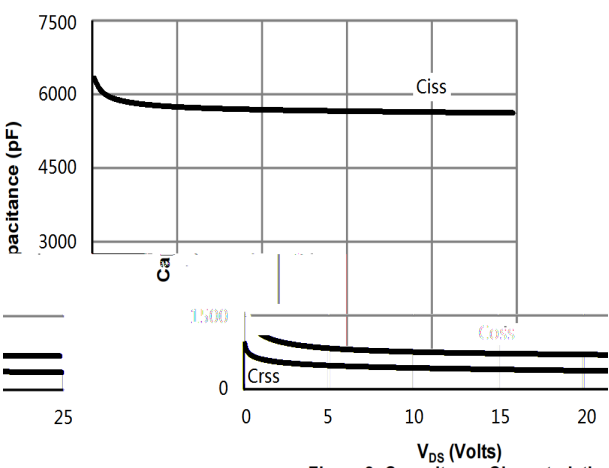


Figure 8: Capacitance Characteristics

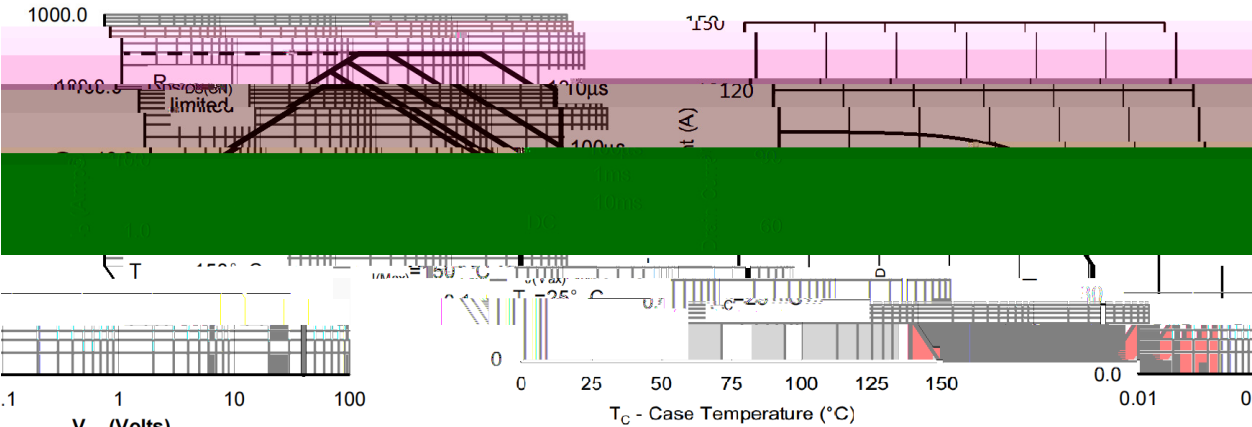
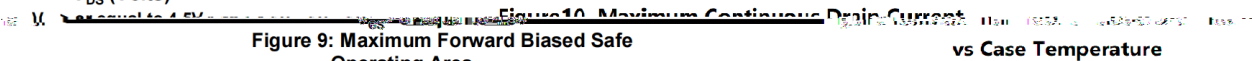
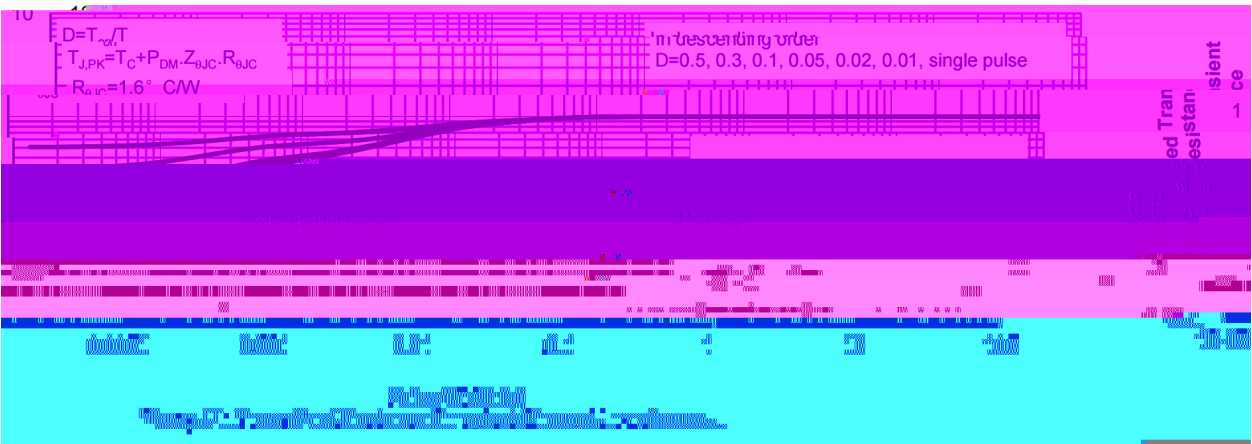


Figure 9: Maximum Forward Biased Safe Operating Area



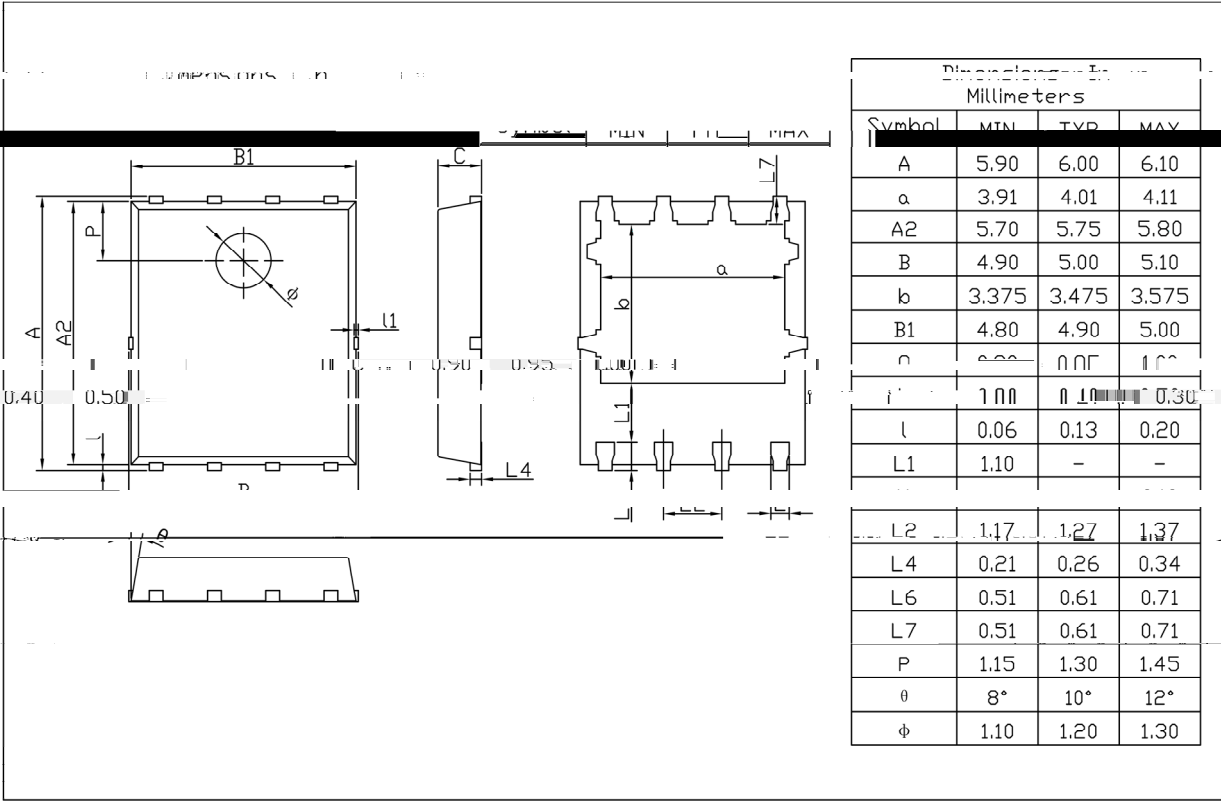
vs Case Temperature



/ Package Dimensions

PDFN5 X6

Unit:mm



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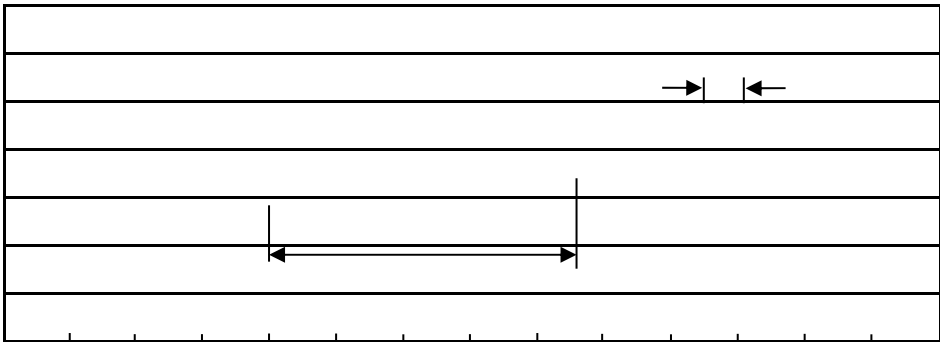
/ Marking Instructions



BR	
020N04	

Note	
BR	Company Code
020N04	Product Type Code
****:	Lot No. Code, code change with Lot No

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



- Note:
- 1

150 180

60 90sec;

2

245±5

5±0.5sec;

3

2 10

/sec.
- 1.Preheating:150~180 , Time:60~90sec.

2.Peak Temp.:245±5 , Duration:5±0.5sec.

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)		
	/	/	/	/	/			
PDFN5×6	5,000	2	10,000	6	60,000	13"×12	360×360×50	380×335×366

/ Notices