

BRCS020N04ZCQ

Rev.A Oct.-2022

/ Descriptions

PDFN5×6 N

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

/ Features

AEC-Q101

Low $R_{DS(ON)}$ to minimize conductive loss;low Gate Charge for fast switching;Low Thermal resistance; Qualified to AEC-Q101 Standards for High Reliability; HF Product.

/ Applications

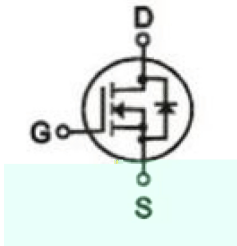
MB/NB/UMPC/VGA

Buck

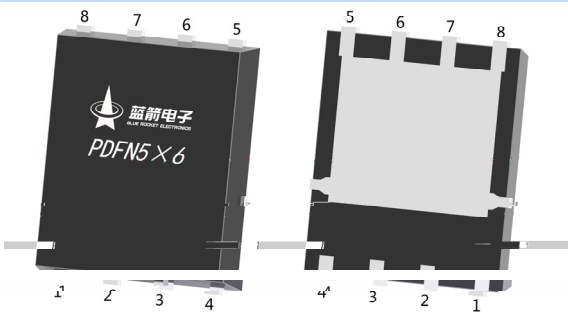
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Battery Management,High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA,Networking DC-DC Power System,Load Switch, Meet the stringent requirements of automotive applications.

/ 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($T_a=25$)

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	$P_D(T_c=25^\circ C)$	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	$t \leq 10s$	$R_{\theta JA}$	20	/ W
	Steady-State		50	
Thermal resistance, junction - case	Steady-State	$R_{\theta JC}$	1.6	

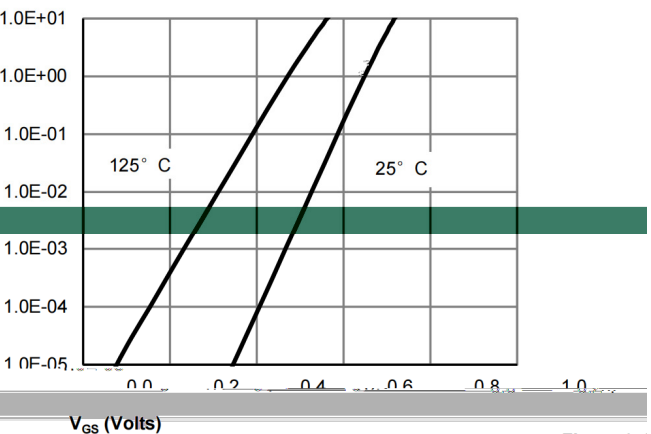
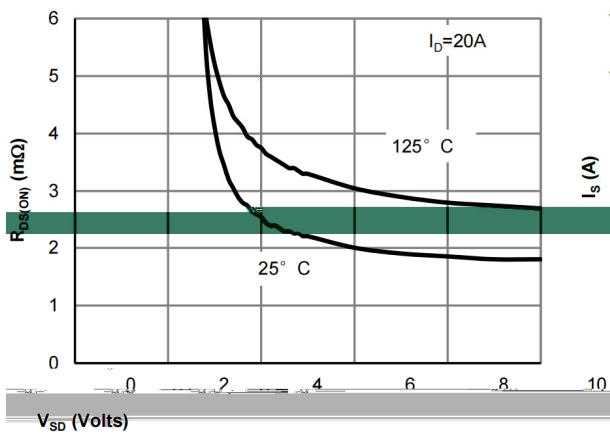
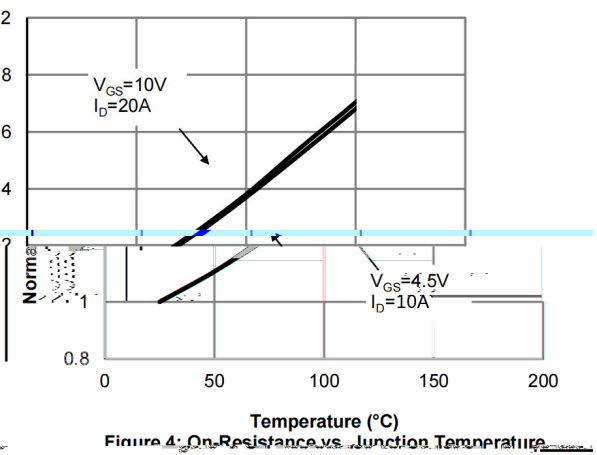
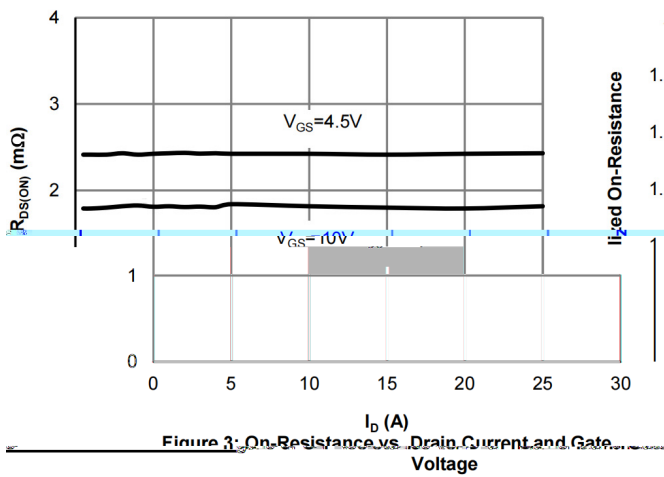
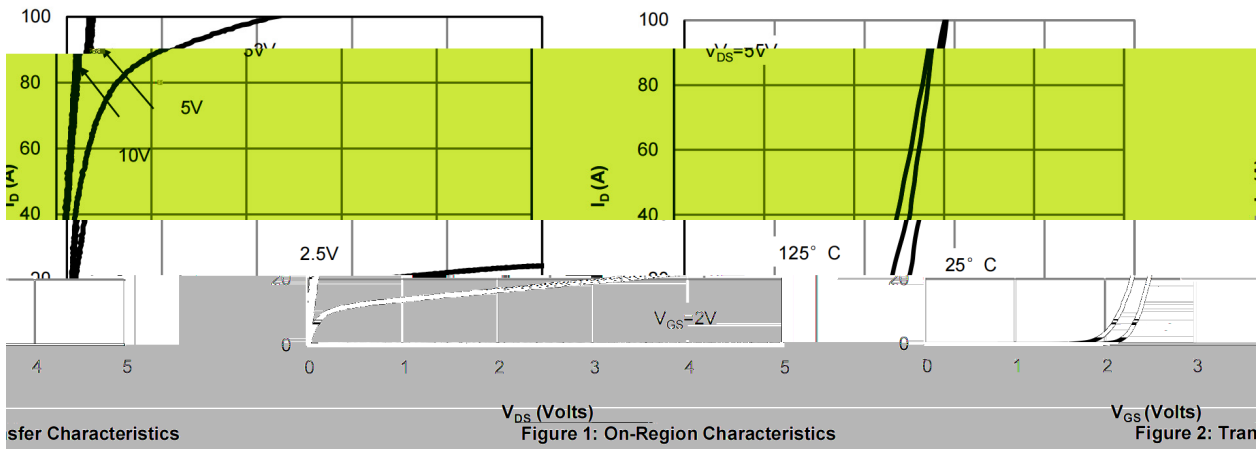
/ Electrical Characteristics($T_a=25$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	40	44		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V$			1	μA
Gate-Body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.7	3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$		1.8	2.0	m
		$V_{GS}=4.5V, I_D=10A$		2.4	4.0	
Diode Forward Voltage	V_{SD}	$I_S=1A, V_{GS}=0V$			1.2	V
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$		10850		pF
Output Capacitance	C_{oss}			830		
Reverse Transfer Capacitance	C_{rss}			750		
Gate resistance	R_g		$V_{GS}=0V, f=1MHz, V_{DS}=0V$		1.5	
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10V, I_D=20A, V_{DS}=20V$		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	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=20V$ $R_L=1.0\Omega$ $R_{GEN}=3\Omega$		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



Body Diode Characteristics

/ Electrical Characteristic Curve

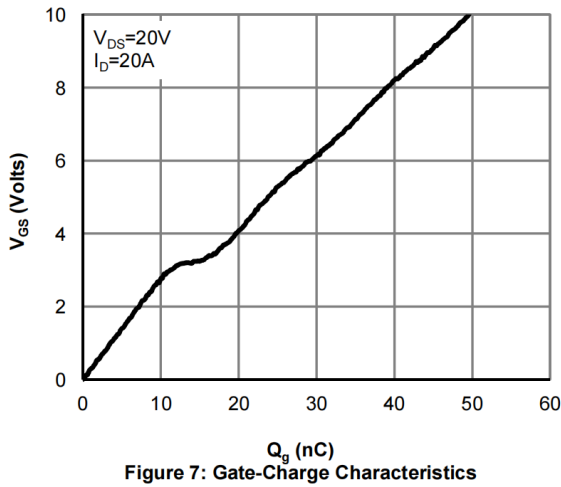


Figure 7: Gate-Charge Characteristics

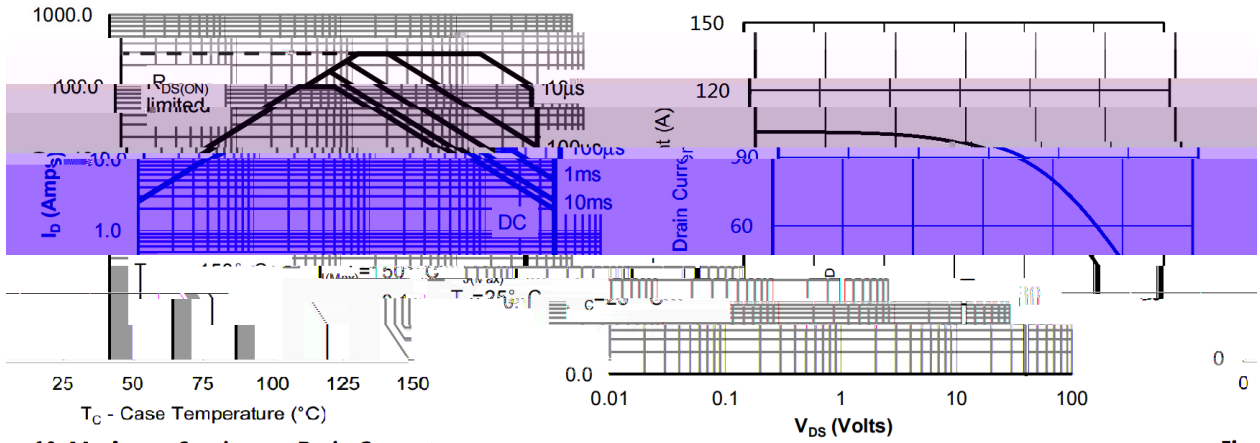
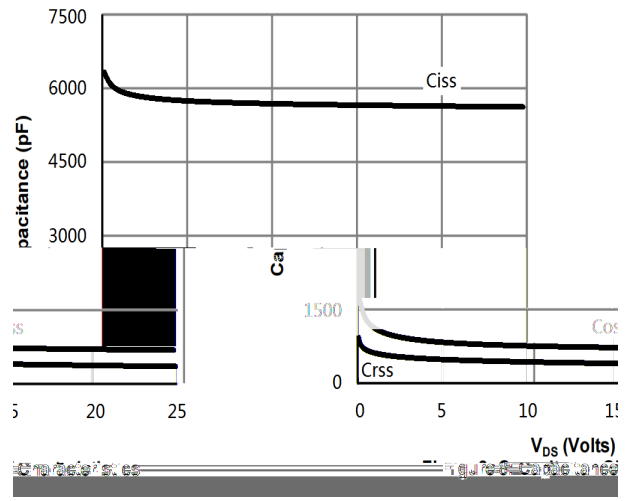
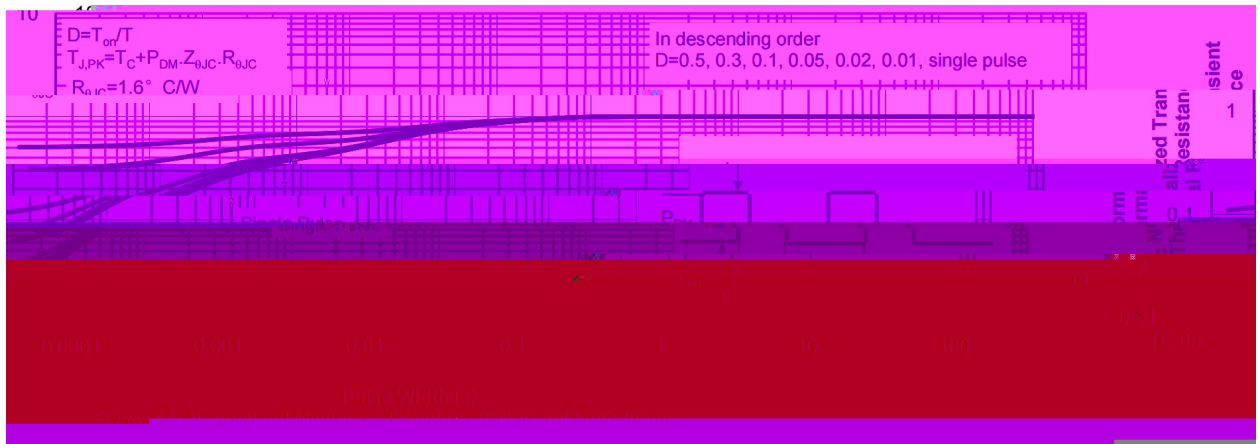
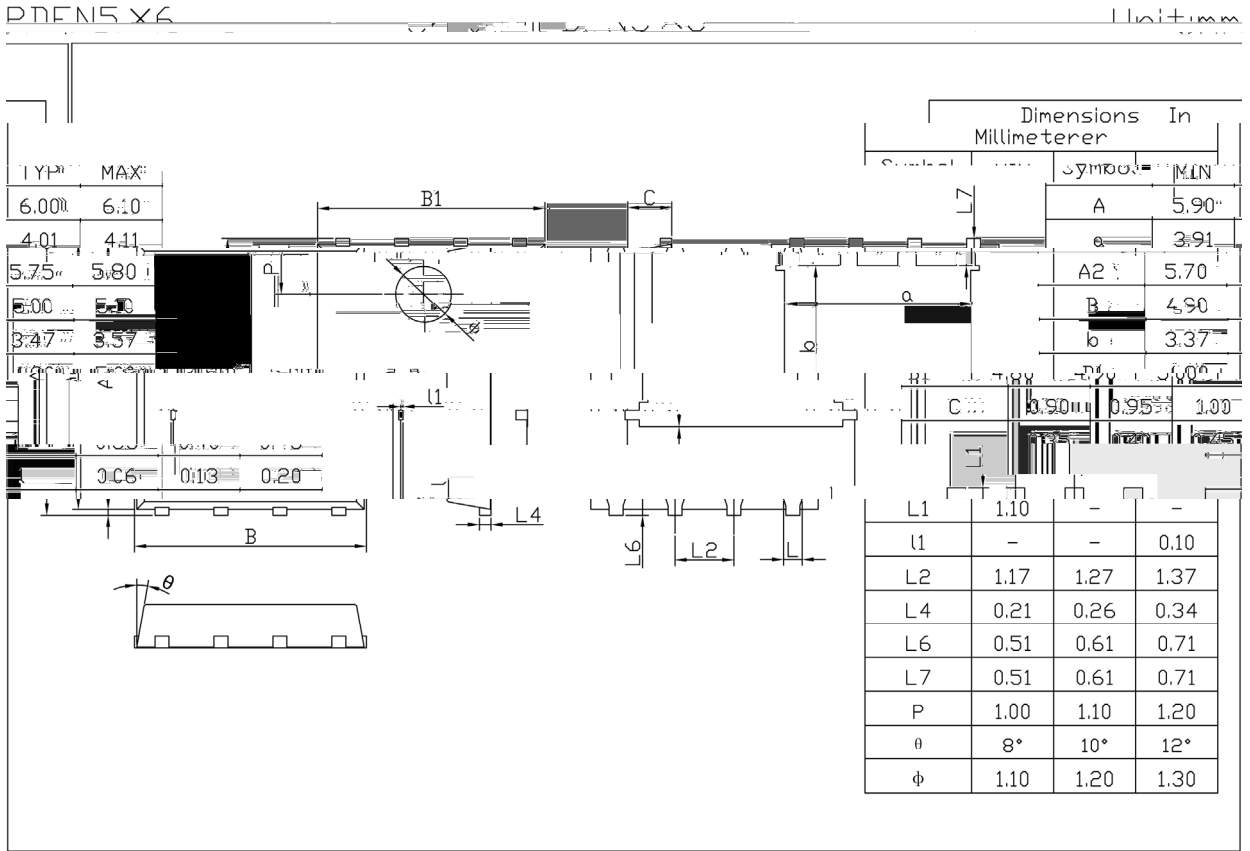


Figure 10: Maximum Continuous Drain Current vs Case Temperature

Figure 9: Maximum Forward Biased Safe Operating Area

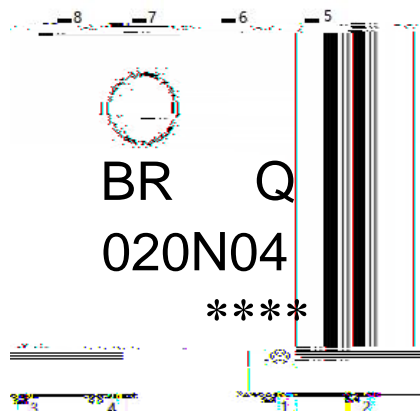


/ Package Dimensions



Rev.00 201812

/ Marking Instructions



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020N04

Note

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Company Code

Q:

Automobile halogen-free product Code

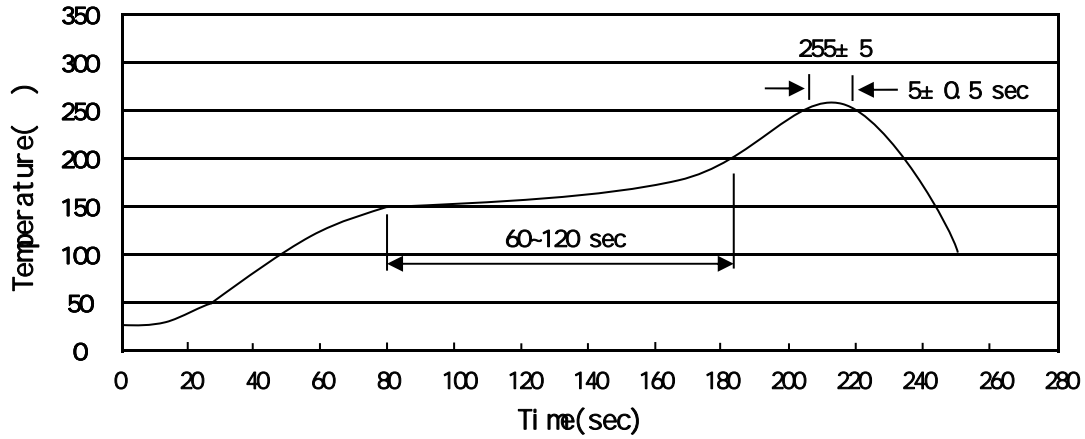
020N04

Product Type

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Lot No. Code, code change with Lot No

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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 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	/	/	/	/	/			
PDFN5×6	5000	2	10000	6	60000	13"×12	360×360×50	380×335×366

/ Notices