/ Descriptions

PDFN5×6 N

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

/ Features

V_{DS}(V)=40V I_D=60A

$R_{DS(ON)}$@10V≤6mΩ(Typ. 5.6mΩ)

$R_{DS(ON)}$@4.5V≤9mΩ(Typ.7.8mΩ)

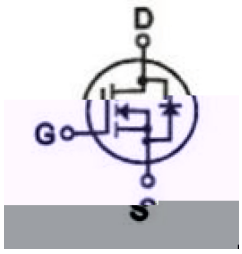
AEC-Q101 Qualified to AEC-Q101 Standards for High Reliability, HF Product.

/ Applications

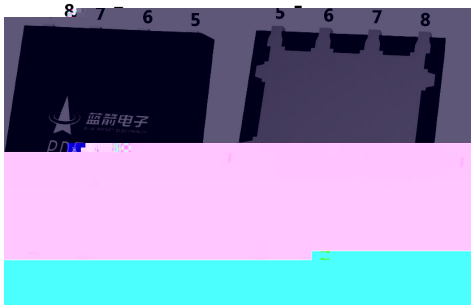
MB/NB/UMPC/VGA Buck -

Battery Management,High Frequency Point-of-Load Synchronous Buck Conventer 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

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings(T_a=25)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	40	V
Drain Current		I_D(Tc=25)	60	A
Drain Current - Pulsed		I_{DM}	120	A
Gate-Source Voltage		V_{GS}	±20	V
Single Pulsed Avalanche Energy		E_{AS}	300	mJ
Avalanche Current		I_{AS}	24.5	A
Power Dissipation		P_D(Tc=25)	37	W
Operating and Storage Temperature Range		T_J,T_{stg}	-55 to 150	
Thermal resistance, junction - ambient	t ≤ 10s	$R_{\theta JA}$	25	/ W
	Steady-State		55	
Thermal resistance, junction - case	Steady-State	$R_{\theta JC}$	3.4	

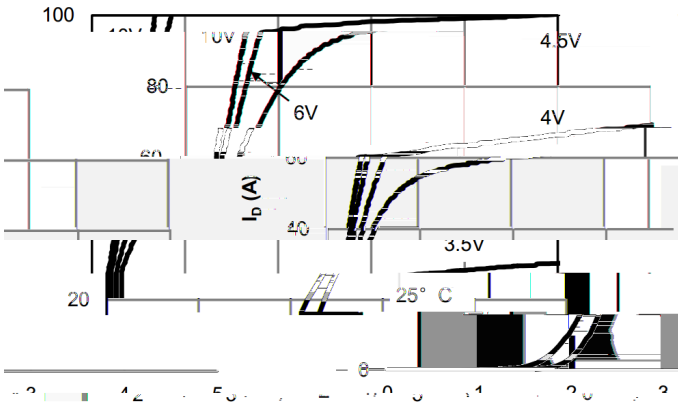
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V	I_D=250μA	40	46		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V	V_{GS}=0V			1	μA
Gate-Body Leakage Current Forward	I_{GSS}	V_{GS}=±20V	V_{DS}=0V			±0.1	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}	I_D=250μA	1.0	1.6	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V	I_D=20A		5.6	6	mΩ
		V_{GS}=4.5V	I_D=10A		7.8	9	mΩ
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V	I_S=1A			1.2	V
Input Capacitance	C_{iss}	V_{DS}=25V f=1.0MHz	V_{GS}=0V		2200		pF
Output Capacitance	C_{oss}				265		
Reverse Transfer Capacitance	C_{rss}				145		
Gate resistance	R_g	V_{GS}=0V f=1MHz	V_{DS}=0V		2.1		Ω
Total Gate Charge	$Q_{g(10V)}$	V_{GS}=10V I_D=20A	V_{DS}=20V		41		nC
Total Gate Charge	$Q_{g(4.5V)}$				9.8		
Gate Source Charge	Q_{gs}				4.2		
Gate Drain Charge	Q_{gd}				4.9		

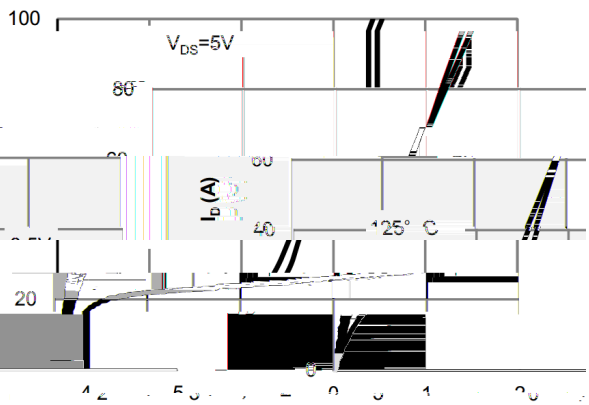
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V V_{DS}=20V I_D=20A R_{GEN}=3.3Ω		11		ns
Turn-On Rise Time	t_r			69		
Turn-Off Delay Time	$t_{d(off)}$			39		
Turn-Off Fall Time	t_f			9.3		

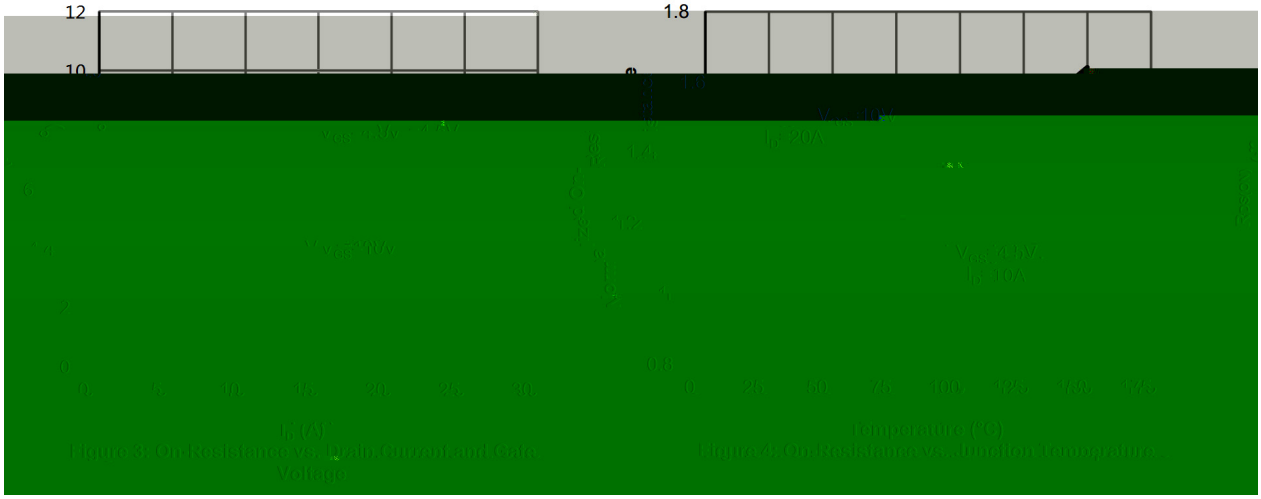
/ Electrical Characteristic Curve



V_{DS} (Volts)
Figure 1: On-Region Characteristics



V_{GS} (Volts)
Figure 2: Transfer Characteristics



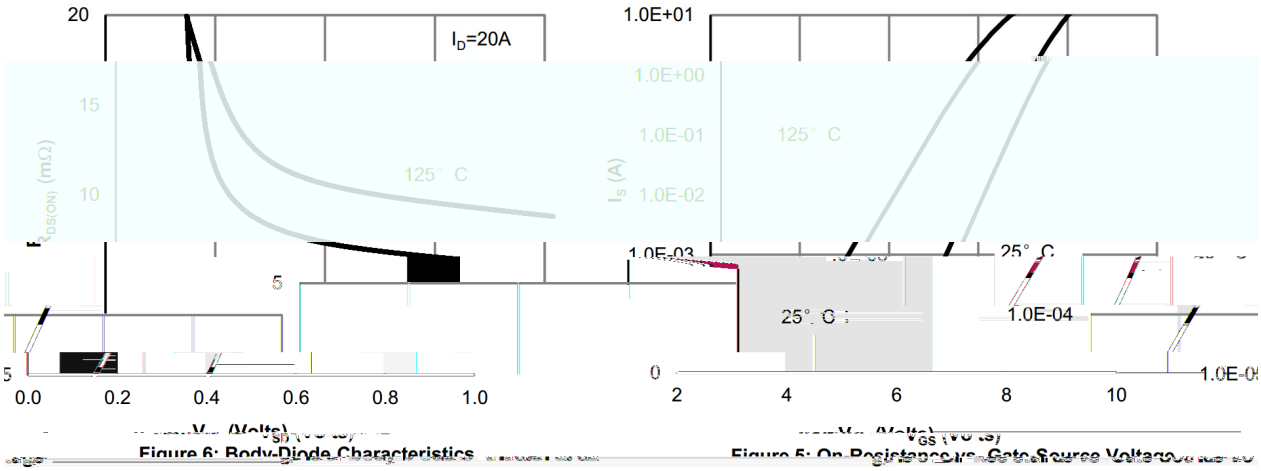
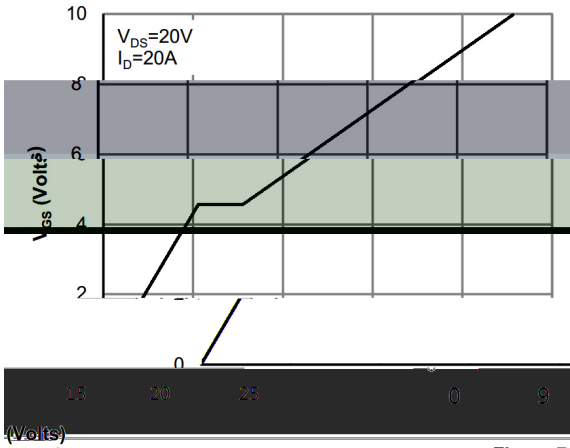


Figure 6: Body-Diode Characteristics

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

/ Electrical Characteristic Curve



(Volts)
ance Characteristics

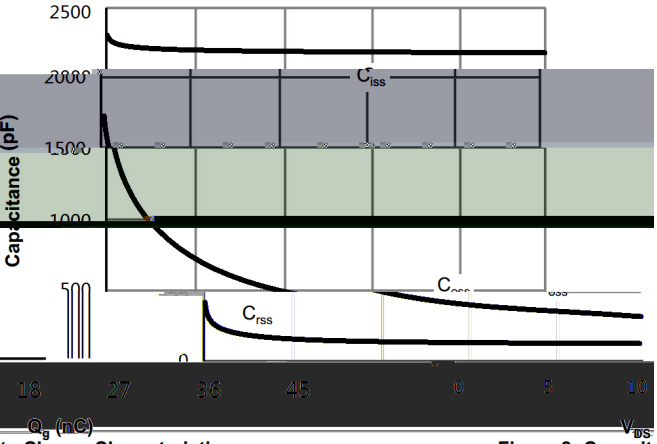


Figure 7: Gate-Charge Characteristics

Figure 8: Capacit

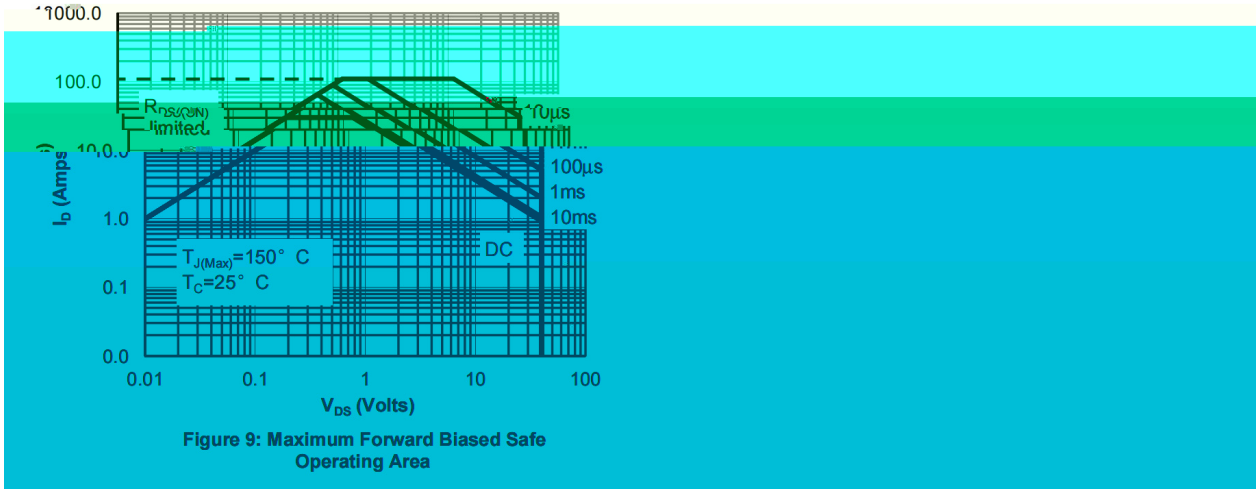


Figure 9: Maximum Forward Biased Safe Operating Area

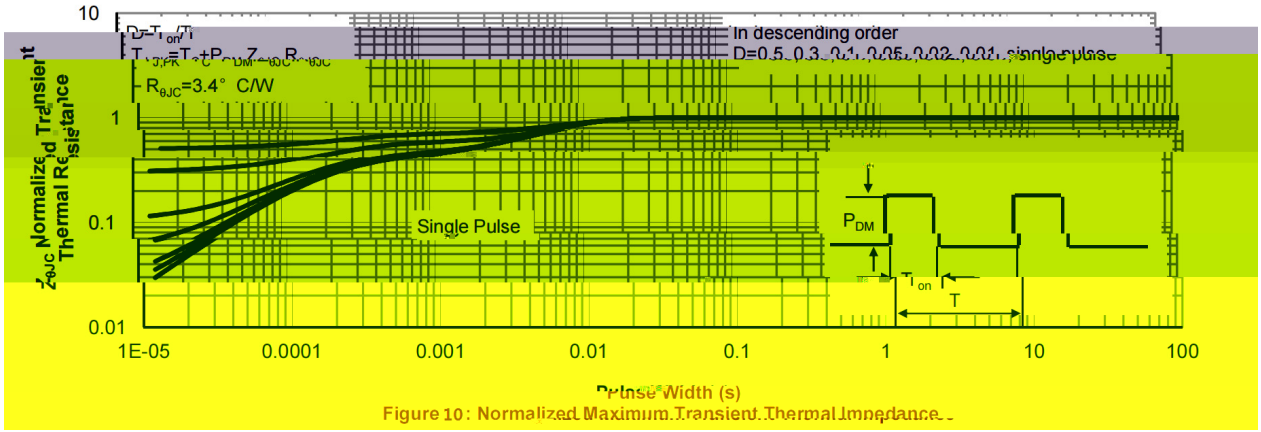
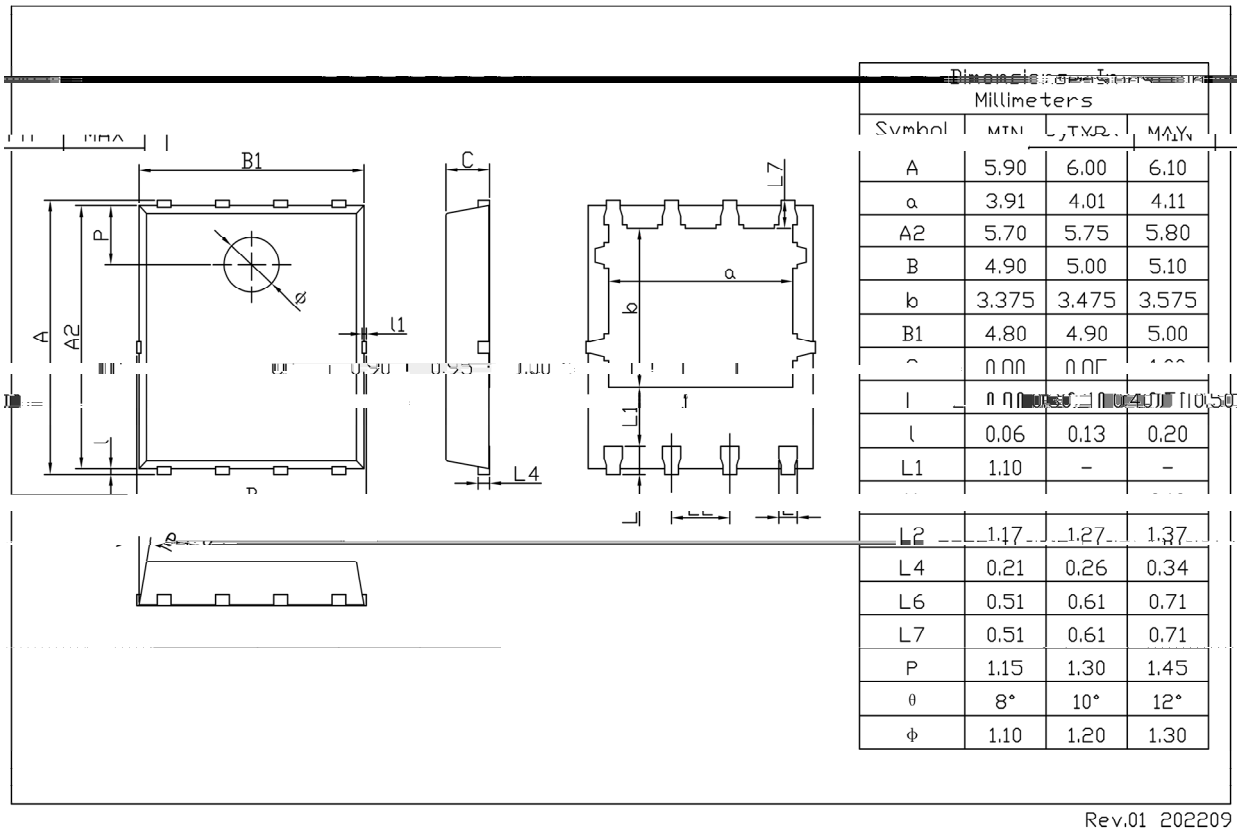


Figure 10: Normalized Maximum Transient Thermal Impedance

/ Package Dimensions

PDFN5×6 Unit:mm



Dimensions In Millimeters			
Symbol	MIN	NOM	MAX
A	5.90	6.00	6.10
a	3.91	4.01	4.11
A2	5.70	5.75	5.80
B	4.90	5.00	5.10
b	3.375	3.475	3.575
B1	4.80	4.90	5.00
[illegible]	[illegible]	[illegible]	[illegible]
l	0.06	0.13	0.20
L1	1.10	–	–
[illegible]	[illegible]	[illegible]	[illegible]
L2	1.17	1.27	1.37
L4	0.21	0.26	0.34
L6	0.51	0.61	0.71
L7	0.51	0.61	0.71
P	1.15	1.30	1.45
θ	8°	10°	12°
Φ	1.10	1.20	1.30

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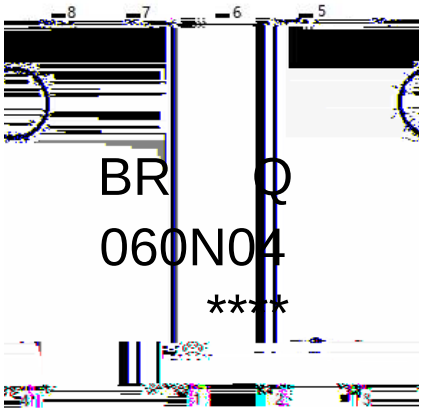
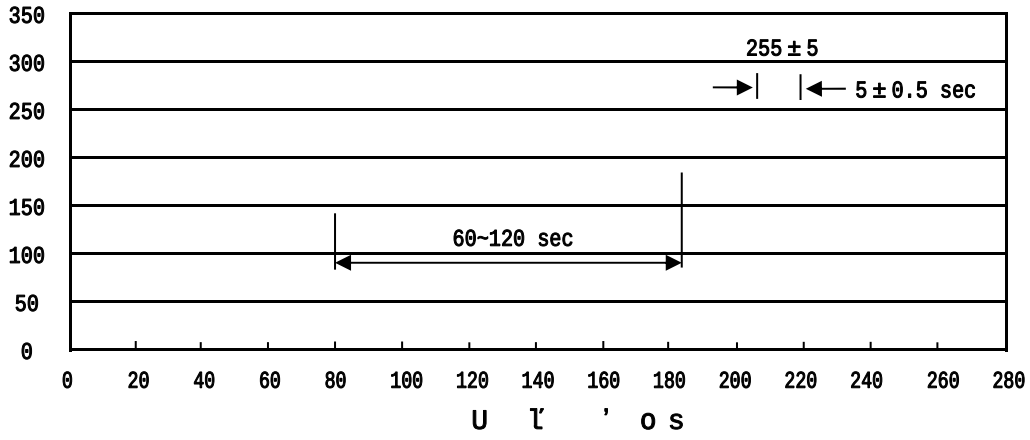
/ Marking Instructions



BR	
Q	
060N04	
****	
Note	
BR	Company Code
Q:	Automobile halogen-free product Code
060N04	Product Type Code
****:	Lot No. Code, code change with Lot No

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



U Ĺ ' o s

1	150	200	60	120sec;	Note: 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.

300
250
200
150
100
50
0

/ 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 mm³)
	/	/	/	/	/			
PDFN5×6	5,000	2	10,000	6	60,000	13''×12	360×360×50	380×335×366

/ Notices