

/ Descriptions

PDFN5×6 N

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

/ Features

 $V_{DS}(V)=40V$ $I_D=60A$ $R_{DS(ON)}@10V$ 6m (Typ. 5.6m) $R_{DS(ON)}@4.5V$ 9m (Typ.7.8m)

AEC-Q101

Qualified to AEC-Q101 Standards for High Reliability,

HF Product.

/ Applications

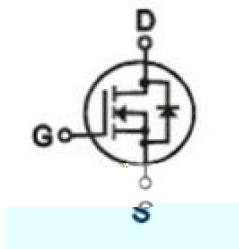
MB/NB/UMPC/VGA

Buck

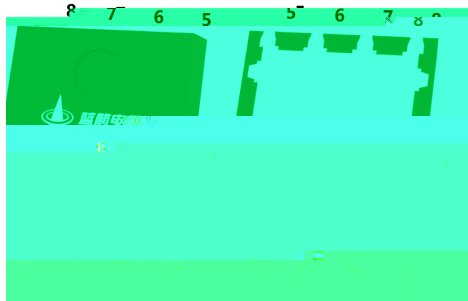
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Battery Management,High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA,Networking DC-DC Power System,Load Switch, Meet the stringent requirements of automotive applications.

/ Equivalent Circuit



/ Pinning



PIN1 2 3 S PIN4 G PIN5 6 7 8 D

/ 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		$I_D(T_c=25^\circ\text{C})$	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		$P_D(T_c=25^\circ\text{C})$	37	W
Operating and Storage Temperature Range		T_J, T_{stg}	-55 to 150	
Thermal resistance, junction - ambient	$t \leq 10\text{s}$	$R_{\theta JA}$	25	/ W
	Steady-State		55	
Thermal resistance, junction - case	Steady-State	$R_{\theta JC}$	3.4	

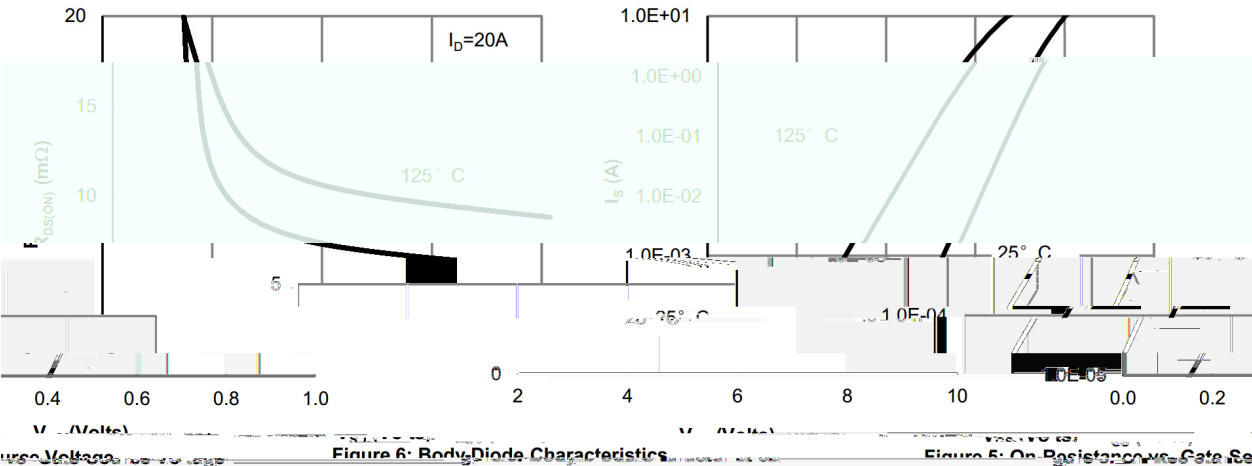
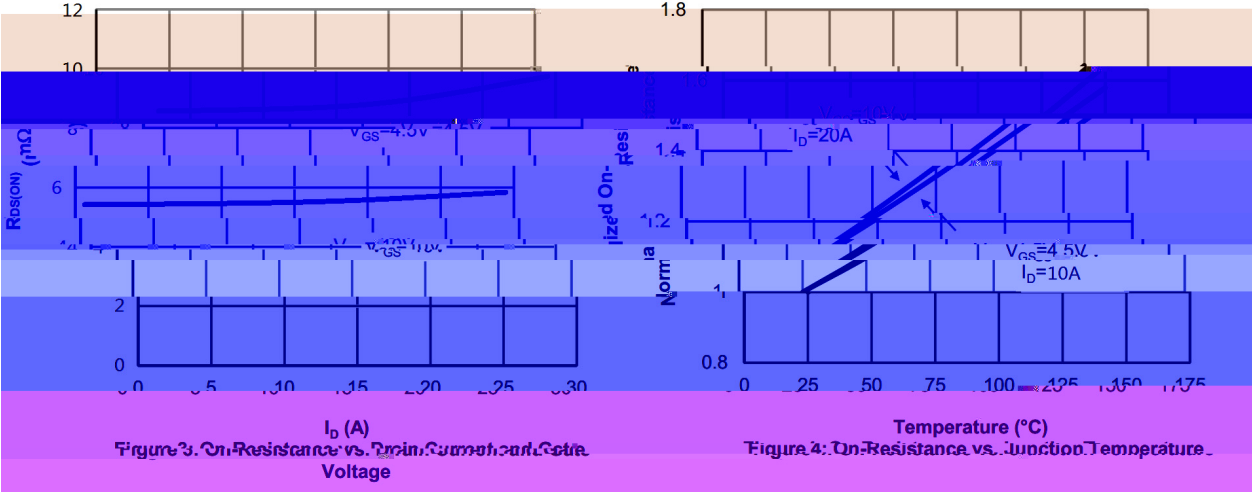
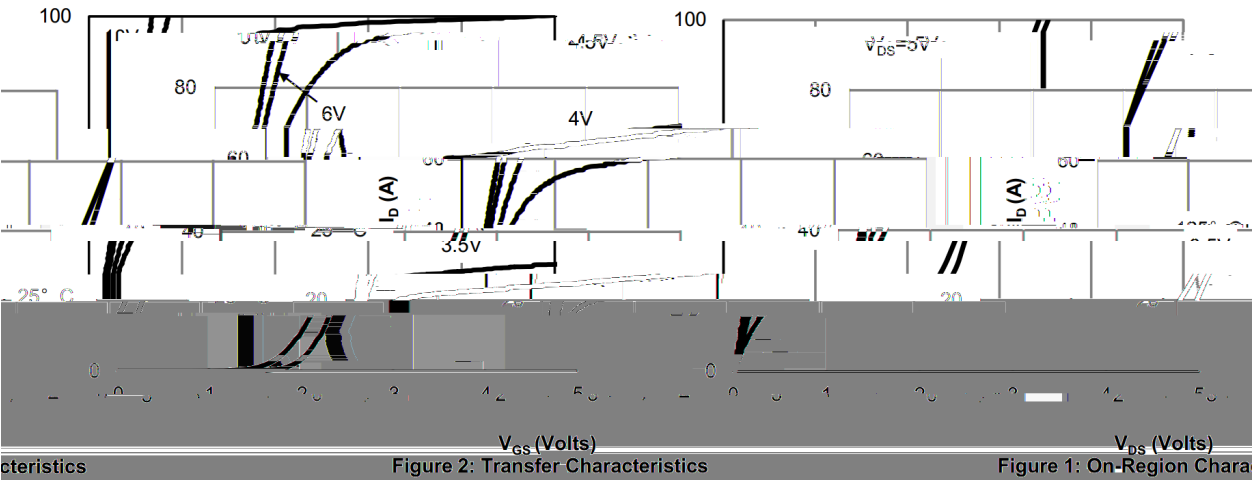
/ Electrical Characteristics($T_a=25^\circ\text{C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS}=0\text{V}$ $I_D=250\text{ }\mu\text{A}$	40	46		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40\text{V}$ $V_{GS}=0\text{V}$			1	A
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 20\text{V}$ $V_{DS}=0\text{V}$			± 0.1	A
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\text{ }\mu\text{A}$	1.0	1.6	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}$ $I_D=20\text{A}$		5.6	6	m Ω
		$V_{GS}=4.5\text{V}$ $I_D=10\text{A}$		7.8	9	m Ω
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0\text{V}$ $I_S=1\text{A}$			1.2	V
Input Capacitance	C_{iss}	$V_{DS}=25\text{V}$ $V_{GS}=0\text{V}$ $f=1.0\text{MHz}$		2200		pF
Output Capacitance	C_{oss}			265		
Reverse Transfer Capacitance	C_{rss}			145		
Gate resistance	R_g	$V_{GS}=0\text{V}$ $V_{DS}=0\text{V}$ $f=1\text{MHz}$		2.1		
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=10\text{V}$ $V_{DS}=20\text{V}$ $I_D=20\text{A}$		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	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=20V$ $I_D=20A$ $R_{GEN}=3.3$		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



/ Electrical Characteristic Curve

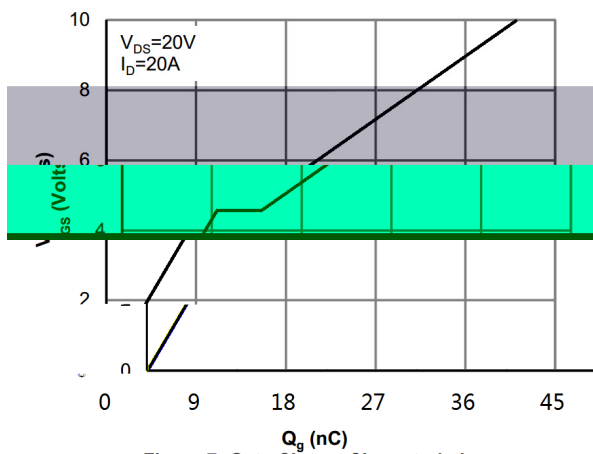


Figure 7: Gate-Charge Characteristics

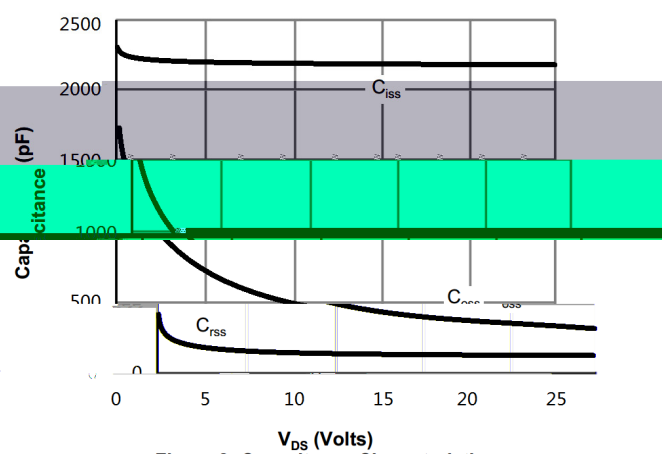


Figure 8: Capacitance Characteristics

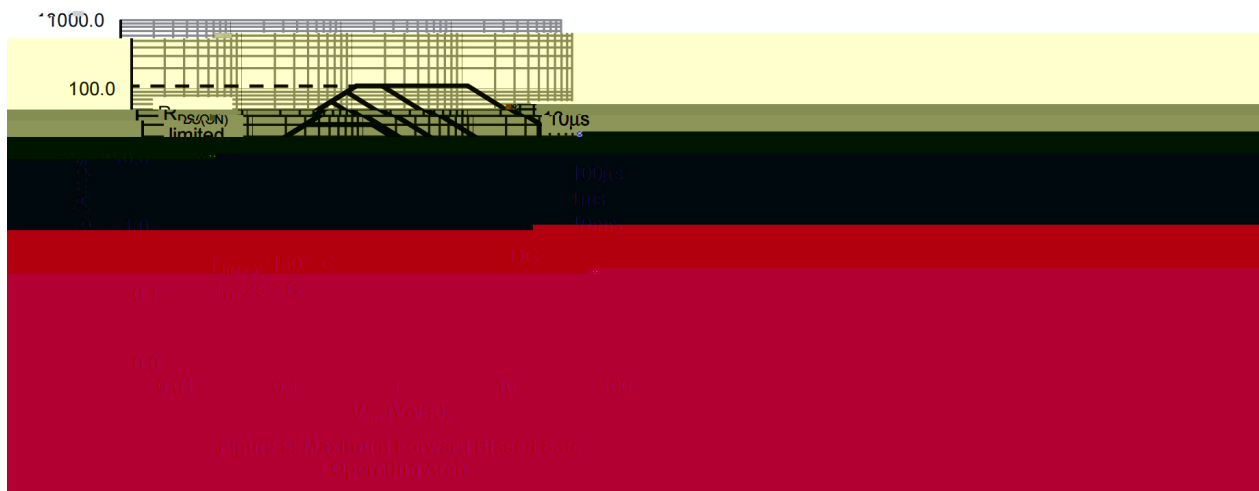


Figure 9: Maximum Forward Bias Safe Operating Area

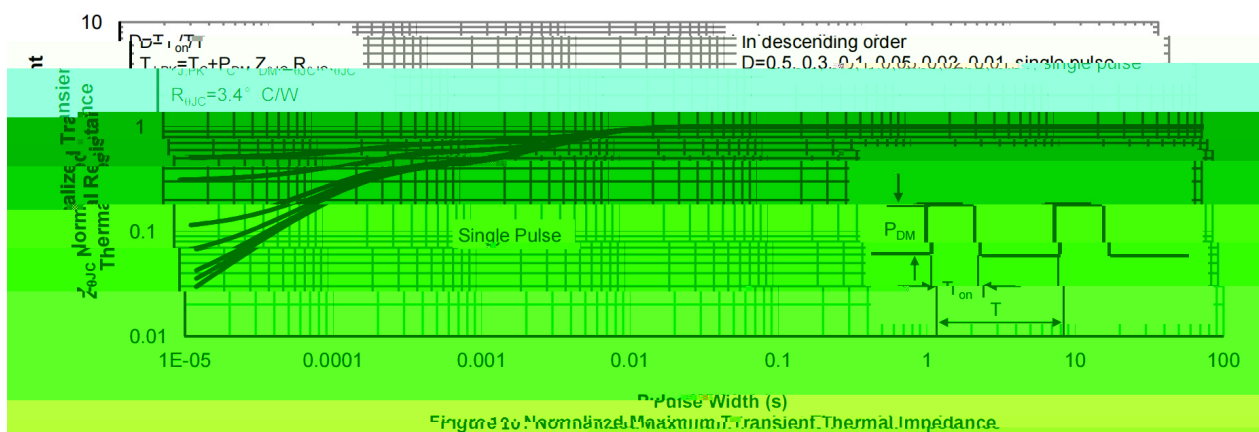
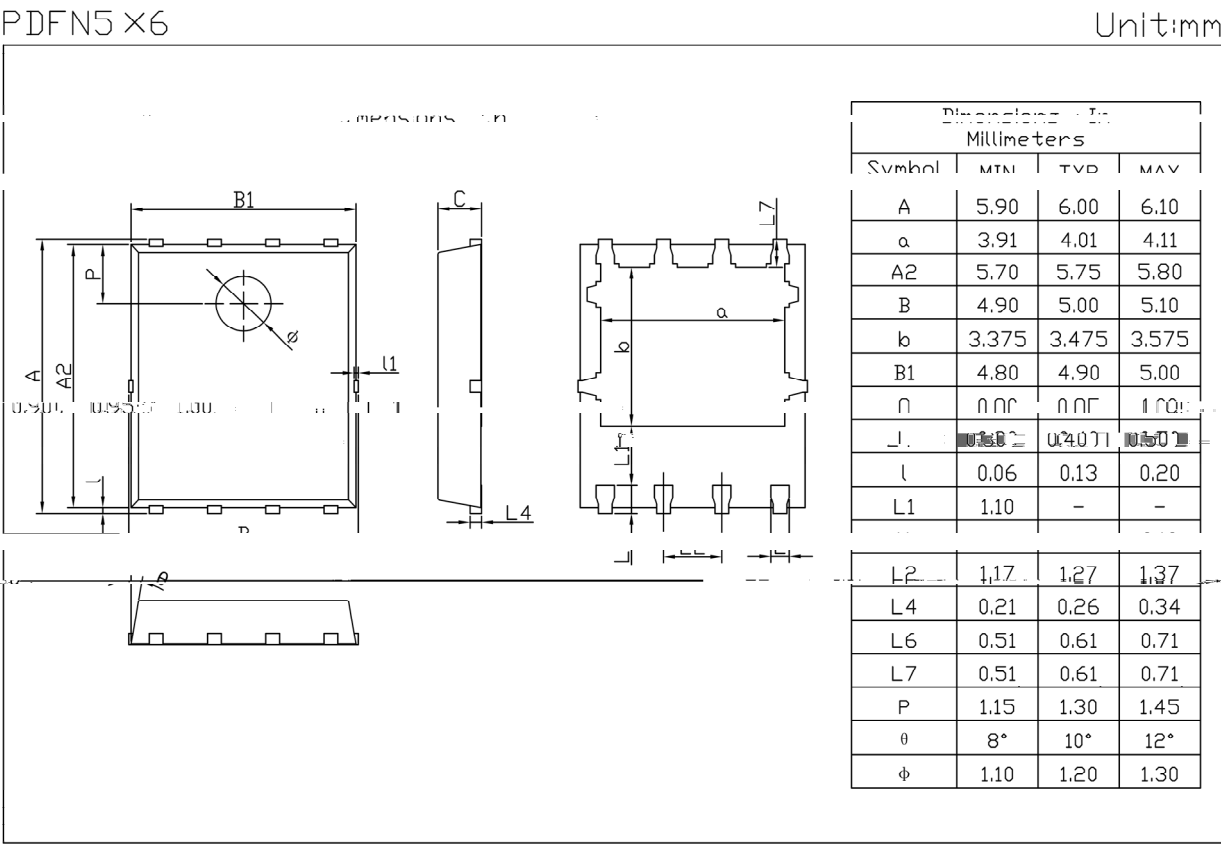


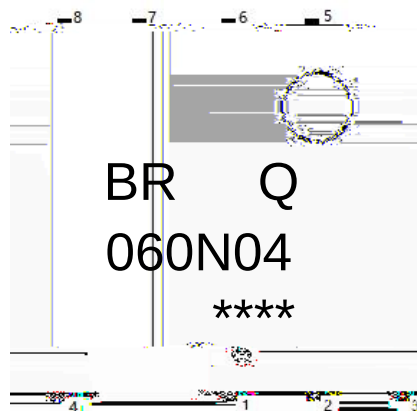
Figure 10: Normalized Maximum Transient Thermal Impedance

/ Package Dimensions



Rev.01 202209

/ 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)

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