

**DESCRIPTION**

The AM011NS04LPJ is available in PDFN8(5x6) Package.

VDSS	RDSON TYP.	ID
40V	1.1mΩ	219A

APPLICATIONS

- Synchronous Rectification
- DC-DC Converters
- Power Management

ORDERING INFORMATION

Package Type	Part Number	
PDFN8(5x6) SPQ: 5,000pcs/Reel	PJ8	AM011NS04LPJ8R
Note	R: Tape & Reel	
AiT provides all RoHS products		

ABSOLUTE MAXIMUM RATINGS

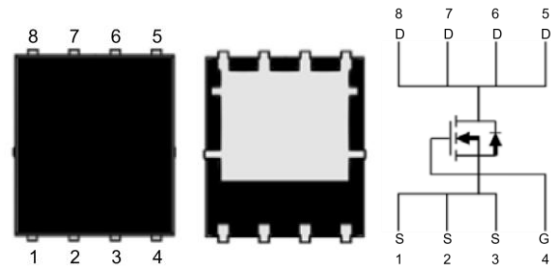
T_C = 25°C, unless otherwise specified.

V _{DSS} , Drain-to-Source Voltage		40V
V _{GSS} , Gate-to-Source Voltage		±20V
I _D , Continuous Drain Current	T _C = 25°C	219A
	T _A = 100°C	138A
I _{DM} , Pulsed Drain Current at V _{GS} =10V		345A
E _{AS} , Single Pulsed Avalanche Energy, L=0.1mH		69mJ
P _D , Power Dissipation	T _C = 25°C	114W
R _{θJC} , Thermal Resistance, Junction-to-Case		1.1°C/W
R _{θJA} , Thermal Resistance, Junction-to-Ambient		50°C/W
T _{STG} , Storage Temperature Range		-55°C ~ +150°C
T _J , Junction Temperature Range		-55°C ~ +150°C
T _L , Maximum Temperature for Soldering		300°C
T _{PAK} , Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds,		260°C

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

FEATURE

- 40V, 219A
- R_{DS(ON)} Typ.=1.1mΩ @ V_{GS}=10V
- Proprietary New Trench Technology
- Fast Switching Capability
- Very Low On-Resistance R_{DS(on)}

PIN DESCRIPTION

Pin #	Symbol	Function
1, 2, 3	S	Source
4	G	Gate
5,6,7,8	D	Drain



ELECTRICAL CHARACTERISTICS

T_J = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V	-	-	1	μA
		V _{DS} =32V, V _{GS} =0V, T _J =125°C			100	
Gate-Body Leakage Current	I _{GSS}	V _{GS} = 20V, V _{DS} =0V	-	-	100	nA
		V _{GS} = -20V, V _{DS} =0V	-	-	-100	
On Characteristics						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} = V _{GS} , I _D = 250μA	1	-	2	V
Static Drain-Source ON-Resistance *	R _{DS(ON)}	V _{GS} = 10V, I _D = 20A	-	1.10	1.40	mΩ
		V _{GS} = 4.5V, I _D = 20A	-	1.40	1.80	
Dynamic Characteristics						
Input Capacitance	C _{iSS}	V _{DS} = 20V, V _{GS} =0V, f=150MHz	-	6461	-	pF
Output Capacitance	C _{oSS}		-	196	-	
Reverse Transfer Capacitance	C _{rSS}		-	3257	-	
Gate Series Resistance	R _G	f=1.0MHz	-	1.5	-	Ω
Total Gate Charge	Q _g	V _{DD} = 20V , I _D =20A V _{GS} =4.5V	-	55	-	nC
Gate-Source Charge	Q _{gs}		-	15	-	
Gate-Drain(“Miller”) Charge	Q _{gd}		-	19	-	
Resistive Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DD} =20V, I _D = 20A R _{GEN} =2.5Ω, V _{GS} = 4.5V	-	24	-	ns
Turn-On Rise Time	t _r		-	84	-	
Turn-Off Delay Time	t _{d(off)}		-	62	-	
Turn-Off Fall Time	t _f		-	20	-	
Drain-Source Diode Characteristics						
Continuous Source Current	I _{SD}	Integral PN-diode in MOSFET	-	-	219	A
Pulsed Source Current	I _{SM}		-	-	345	A
Drain to Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S = 50A	-	-	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20A	-	171	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}	di/dt=100A/us	-	381	-	nC

* Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.



TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Typical Output Characteristics

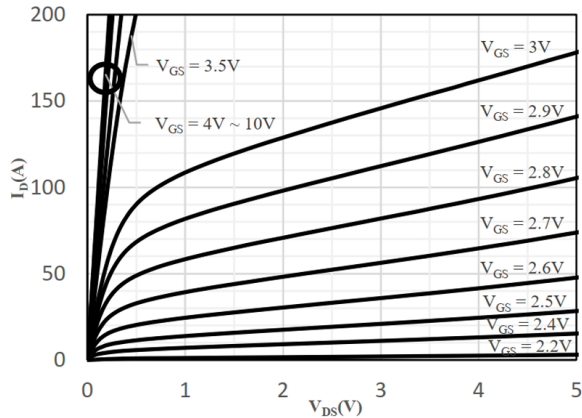


Fig 2. On-Resistance vs. Drain Current and Gate Voltage

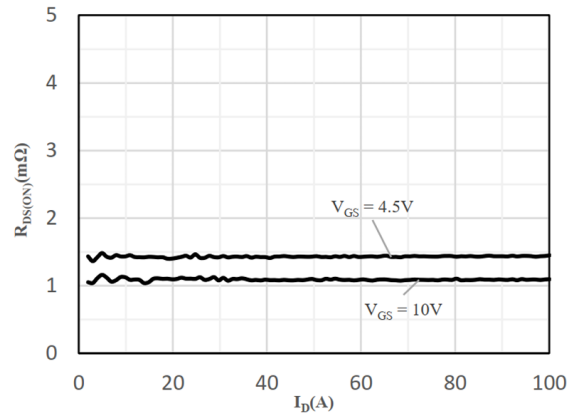


Fig 3. On-Resistance vs. Gate-Source Voltage

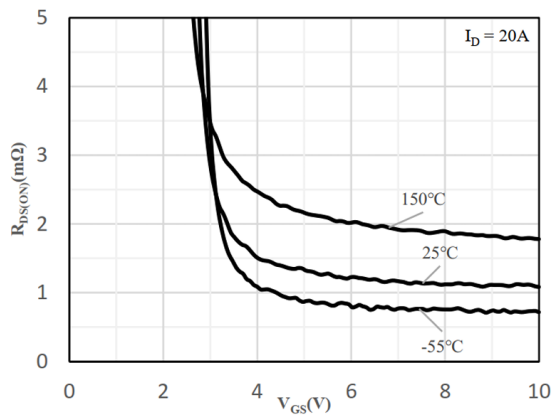


Fig 4. Body Diode Characteristics

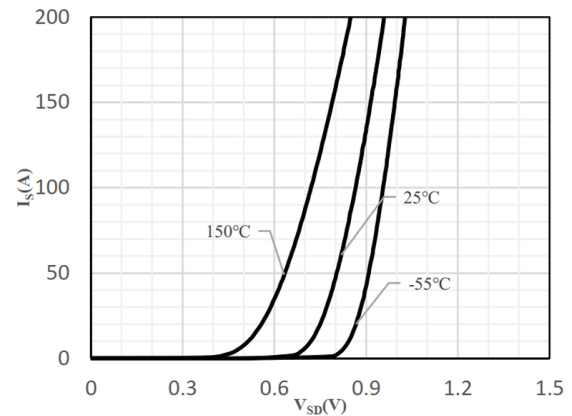


Fig 5. On-Resistance vs. Junction Temperature

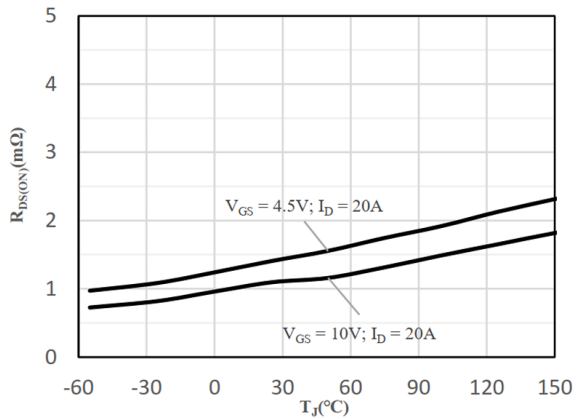


Fig 6. Transfer Characteristics

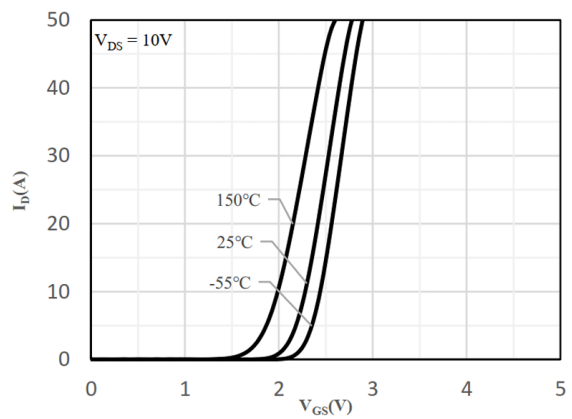




Fig 7. Capacitance Characteristics

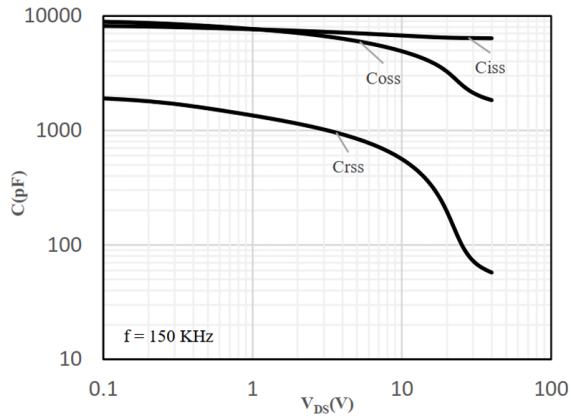


Fig 8. Gate-Charge Characteristics

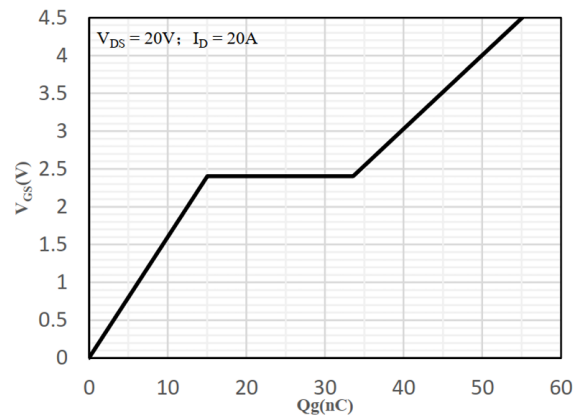


Fig 9. Breakdown Voltage vs. Junction Temperature

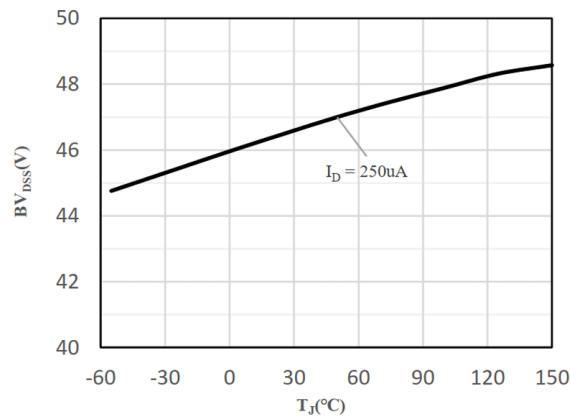


Fig 10. $V_{GS(th)}$ vs. Junction Temperature

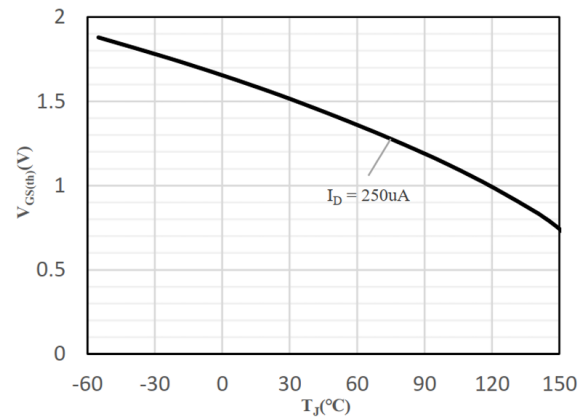
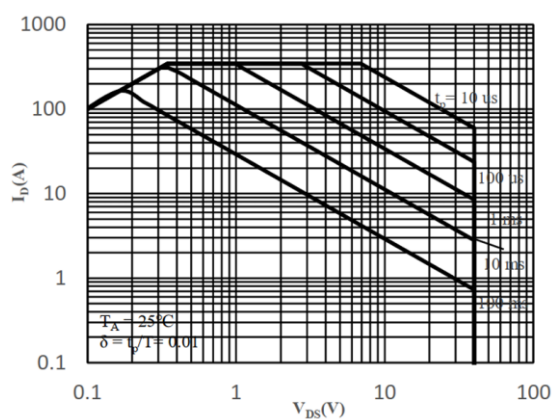


Fig 11. Safe Operation Area





TEST CIRCUITS AND WAVEFORMS

Fig 12. Peak Diode Recovery dv/dt Test Circuit

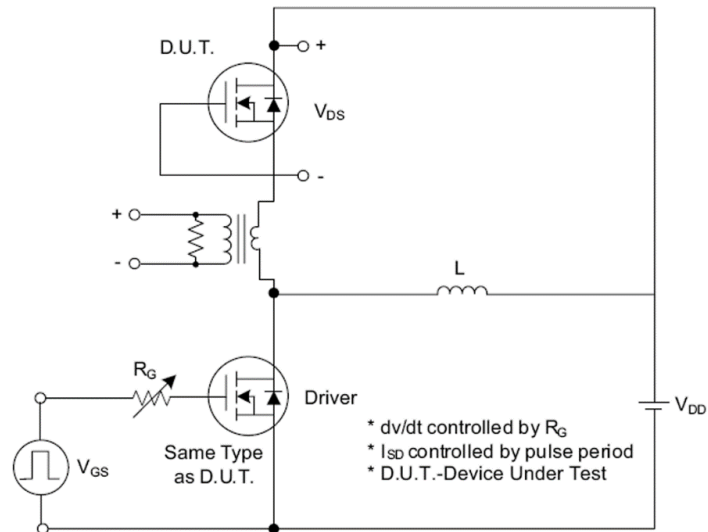


Fig 13. Peak Diode Recovery dv/dt Waveforms

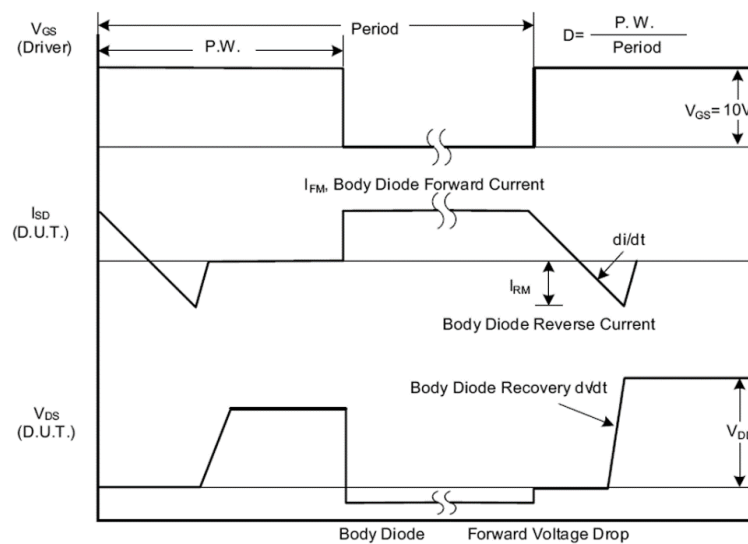




Fig 14. Switching Teat Circuit

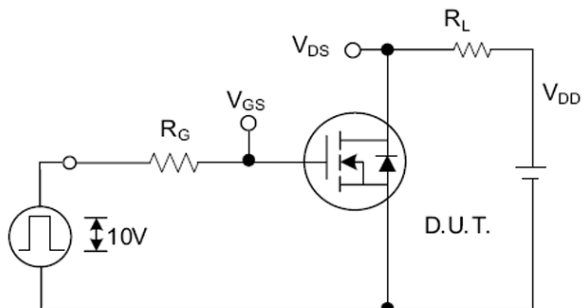


Fig 15. Switching Waveforms

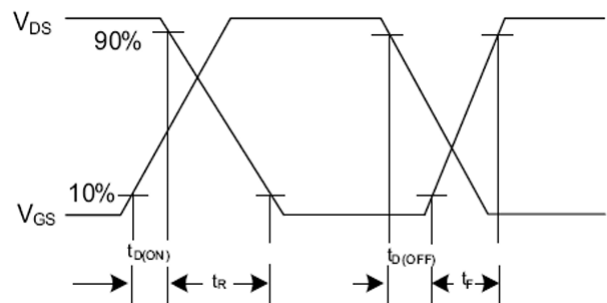


Fig 16. Gate Charge Test Circuit

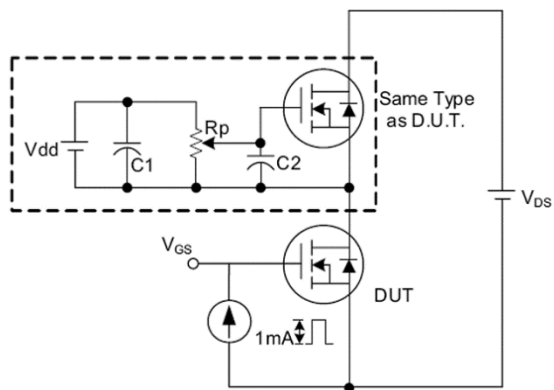


Fig 17. Gate Charge Waveform

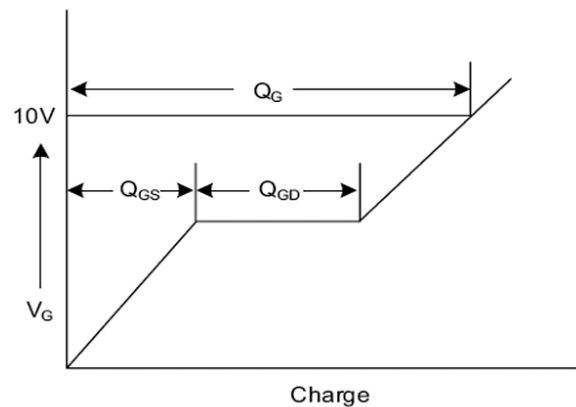


Fig 18. Unclamped Inductive Switching Teat Circuit

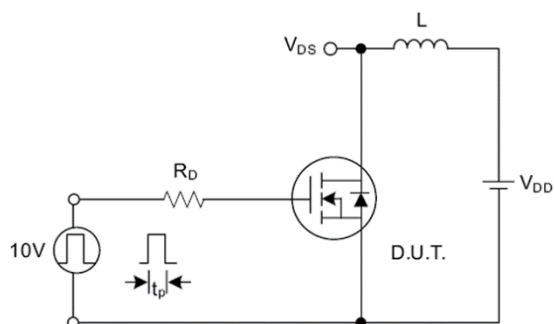
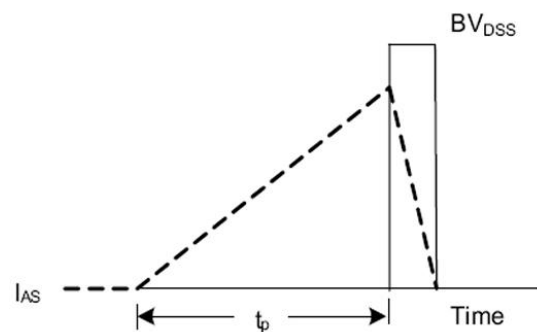


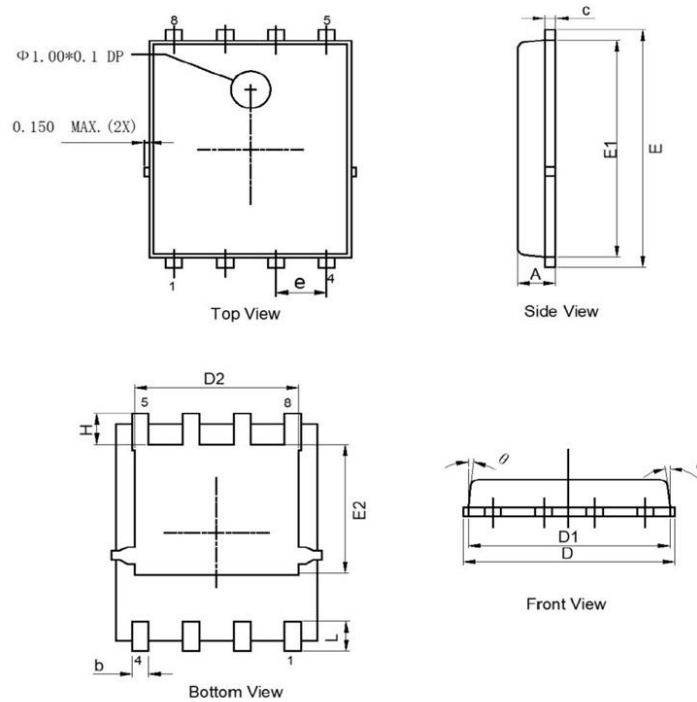
Fig 19. Unclamped Inductive Switching Waveform





PACKAGE INFORMATION

Dimension in PDFN8 (5x6) (Unit: mm)



Symbol	Millimeters	
	Min.	Max.
A	0.900	1.100
b	0.310	0.510
c	0.210	0.340
D	5.050	5.400
D1	4.950	5.150
D2	4.000	4.200
E	6.300	6.500
E1	5.750	5.950
E2	3.430	3.630
e	1.270 BSC.	
H	0.730	0.930
L	0.610	0.810
θ	0°	12°



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