



### DESCRIPTION

The AM20NS10L is available in TO-252 package.

VDSS	RDSON		ID
	V <sub>GS</sub> =10V	V <sub>GS</sub> =4.5V	
100V	16.5mΩ	22.5mΩ	30A

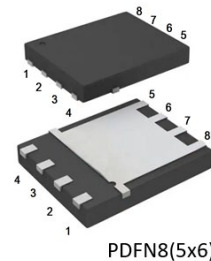
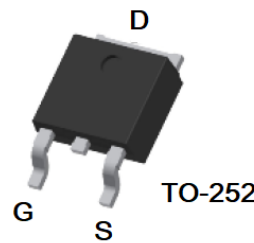
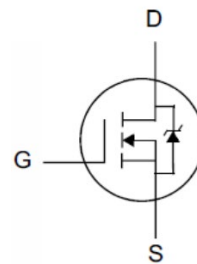
### FEATURE

- Fast Switching
- Low On-Resistance
- Low Gate Charge
- Low Reverse Transfer Capacitances
- High Avalanche Ruggedness
- RoHS Product

### APPLICATION

- Switching Applications
- LED Backlighting

### PIN DESCRIPTION



### ORDERING INFORMATION

Package Type	Part Number	
TO-252 SPQ: 2,500pcs/Reel	D	AM20NS10LDR
		AM20NS10LDVR
PDFN8 (5 x 6) SPQ: 5,000pcs/Reel	PJ8	AM20NS10LPJ8R
		AM20NS10LPJ8VR
Note	R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

Pin#		Symbol	Function
TO-252	PDFN8 (5x6)		
1	4	G	Gate
2,4	5,6,7,8	D	Drain
3	1,2,3	S	Source



## ABSOLUTE MAXIMUM RATINGS

T<sub>C</sub>=25°C, unless otherwise specified

V <sub>DSS</sub> , Drain-Source Voltage		100V
I <sub>D</sub> , Continuous Drain Current	Silicon Limited	30A
	TO-252 Package Limited	60A
	PDFN8 (5x6) Package Limited	35A
	T <sub>C</sub> =100°C, Silicon Limited	19A
I <sub>DM</sub> <sup>(1)</sup> , Pulsed Drain Current		120A
V <sub>GS</sub> , Gate-Source Voltage		±20V
E <sub>AS</sub> <sup>(2)</sup> , Avalanche Energy		56mJ
P <sub>D</sub> , Power Dissipation		33.7W
P <sub>D</sub> , Derating Factor	T <sub>C</sub> =25°C	0.27W/°C
T <sub>J</sub> , Operating Junction Temperature Range		150°C
T <sub>STG</sub> , Storage Temperature Range		-55°C~+150°C
T <sub>L</sub> , Maximum Temperature for Soldering		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.

(1) Repetitive Rating : Pulse width limited by maximum junction temperature

(2) L=0.5mH, I<sub>as</sub>=15A, Start T<sub>J</sub>=25°C

## THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Units
Thermal Resistance, Junction-Case	R <sub>θJC</sub>	3.7	°C/W
Thermal Resistance, Junction-Ambient	R <sub>θJA</sub>	75	



**ELECTRICAL CHARACTERISTICS**

T<sub>C</sub> = 25°C, unless otherwise specified

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
<b>OFF Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	110	-	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> = 100V, V <sub>GS</sub> =0V,	-	-	1	μA
		V <sub>DS</sub> = 80V, V <sub>GS</sub> =0V, T <sub>C</sub> =125°C	-	-	100	
Gate-Source Forward Current	I <sub>GSS(F)</sub>	V <sub>GS</sub> =+20V	-	-	100	nA
Gate-Source Reverse Current	I <sub>GSS(R)</sub>	V <sub>GS</sub> =-20V	-	-	-100	
<b>ON Characteristics</b>						
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A	-	22.5	25	mΩ
		V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	16.5	20	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250uA	1	1.8	2.5	V
Pulse width tp≤300μs, δ≤2%						
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0, f=1MHz	-	1230	-	pF
Output Capacitance	C <sub>oss</sub>		-	256	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	2.8	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> =50V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V	-	26	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	6.1	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	4.8	-	
Gate Resistance	R <sub>G</sub>	V <sub>GS</sub> =0, V <sub>DS</sub> =0	-	0.9	-	Ω
<b>Switching Characteristics</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =50V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V, R <sub>G</sub> =5Ω, Resistive Load	-	8.4	-	ns
Rise Time	t <sub>r</sub>		-	6.3	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	24	-	
Fall Time	t <sub>f</sub>		-	6	-	
<b>Source-Drain Diode Characteristics</b>						
Continuous Source Current	I <sub>S</sub>	-	-	-	30	A
Pulsed Source Current	I <sub>SM</sub>		-	-	120	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A,	-	-	1.2	V
Reverse Recovery Time	T <sub>rr</sub>	I <sub>S</sub> =20A, V <sub>GS</sub> =0, di/dt=500A/us	-	24	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	125	-	nC



## TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Safe Operating Area

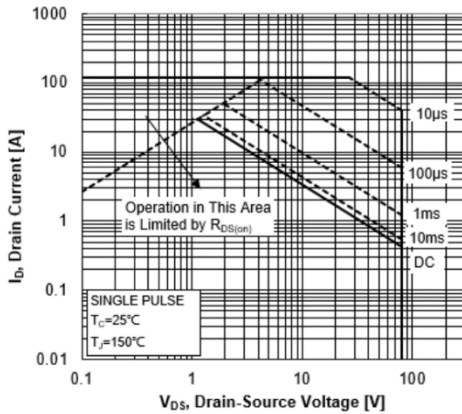


Fig 2. Maximum Power Dissipation vs. Case Temperature

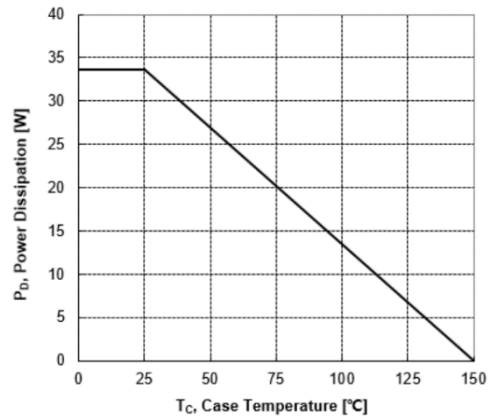


Fig 3. Maximum Continuous Drain Current vs. Case Temperature

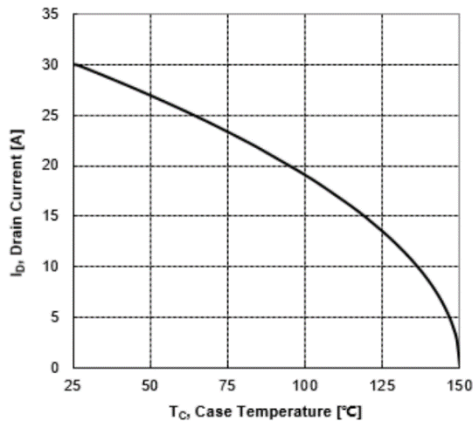


Fig 4. Typical Output Characteristics

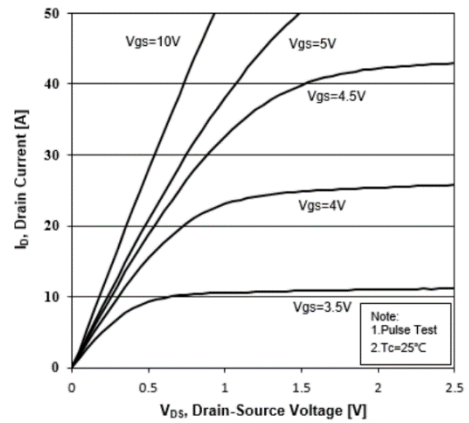


Fig 5. Transient Thermal Impedance

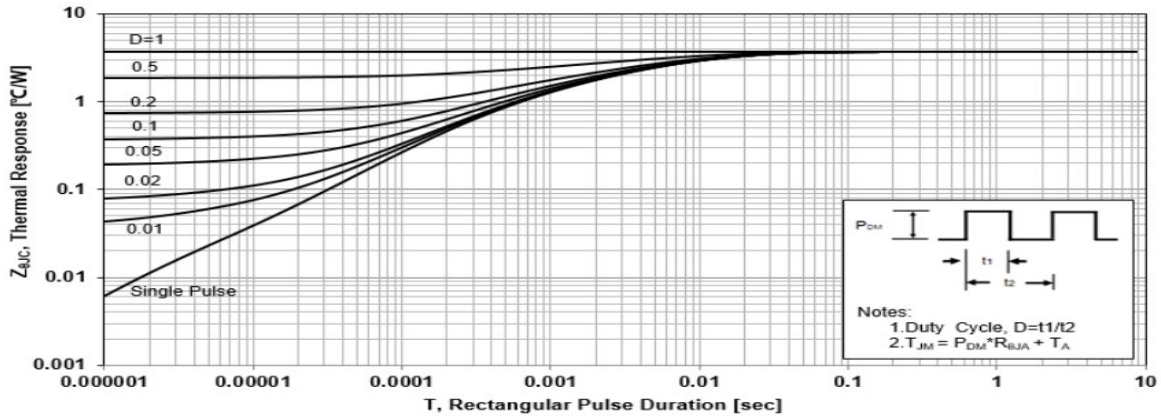




Fig 6. Typical Transfer Characteristics

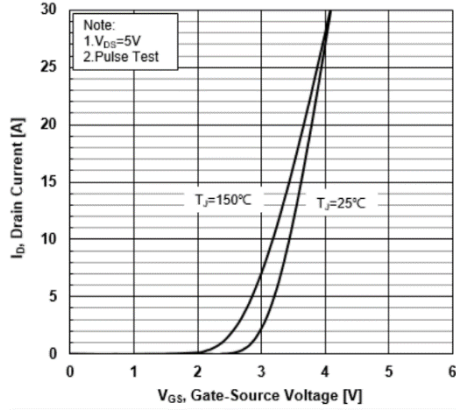


Fig 7. Source-Drain Diode Forward Characteristics

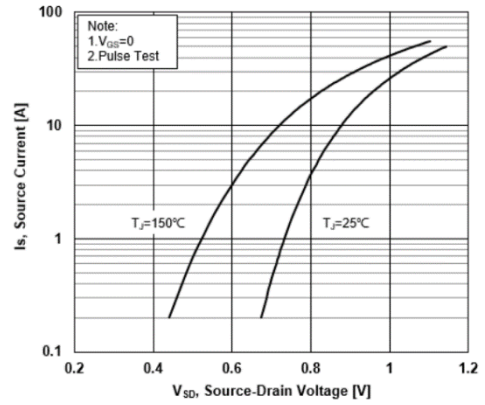


Fig 8. Drain-Source On-Resistance vs. Drain Current

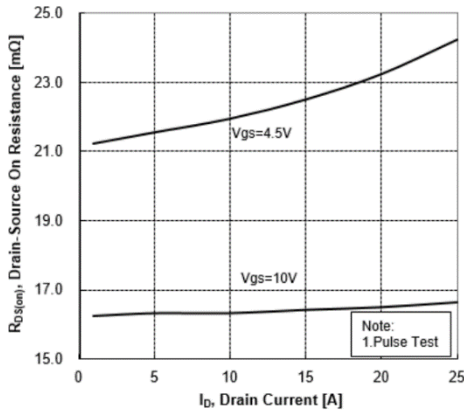


Fig 9. Normalized On-Resistance vs. Junction Temperature

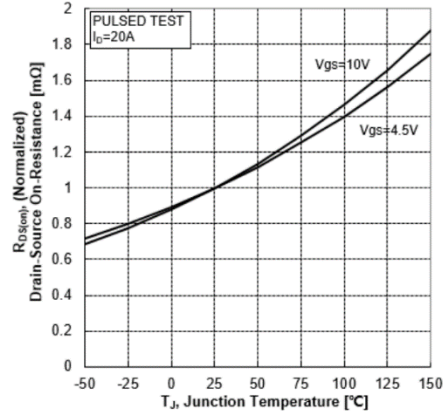


Fig 10. Normalized Threshold Voltage vs. Junction Temperature

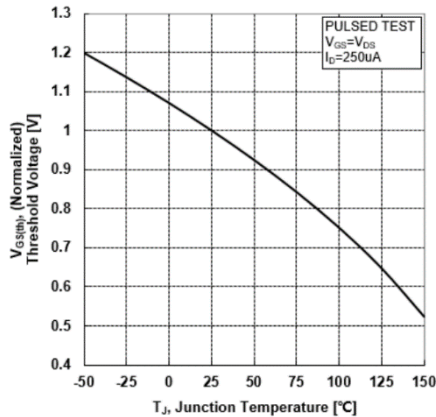


Fig 11. Normalized Breakdown Voltage vs. Junction Temperature

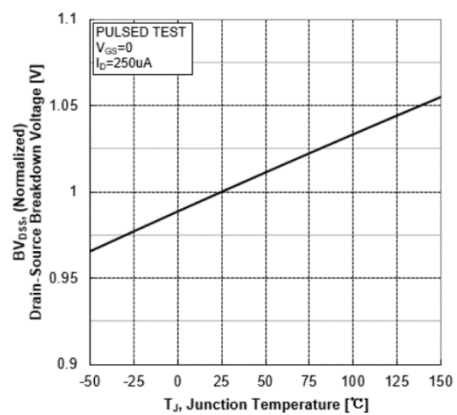




Fig 12. Capacitance Characteristics

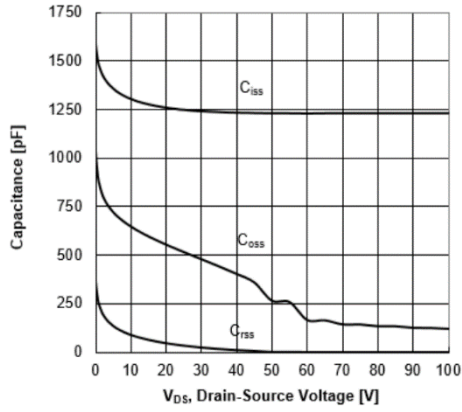


Fig 13. Typical Gate Charge vs. Gate-Source Voltage

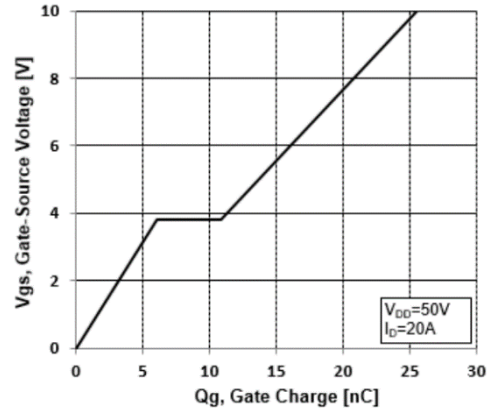


Fig 14. Resistive Switching Test Circuit

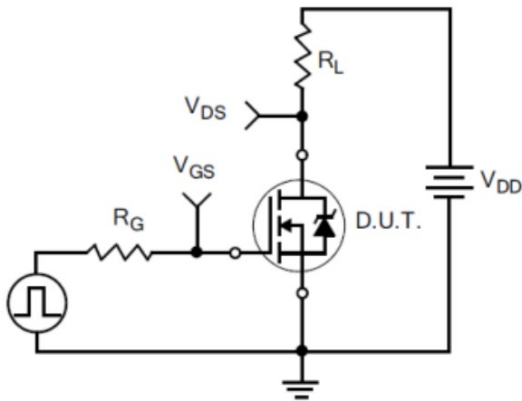


Fig 15. Resistive Switching Waveforms

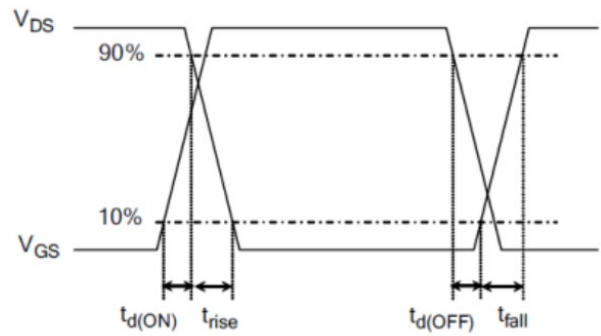


Fig 16. Gate Charge Test Circuit

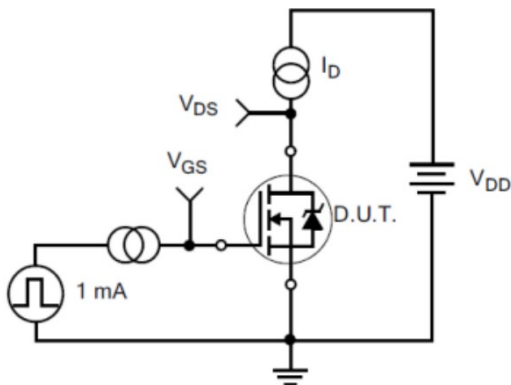
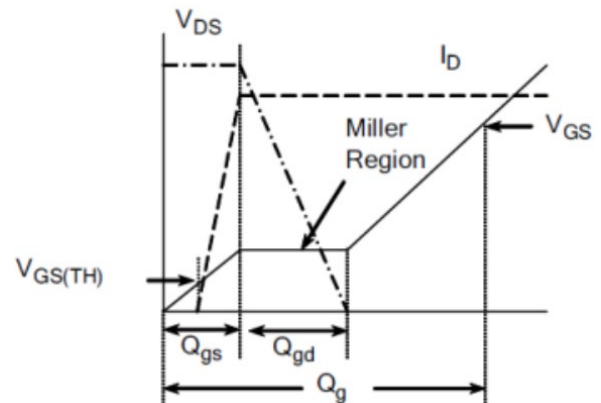


Fig 17. Gate Charge Waveforms

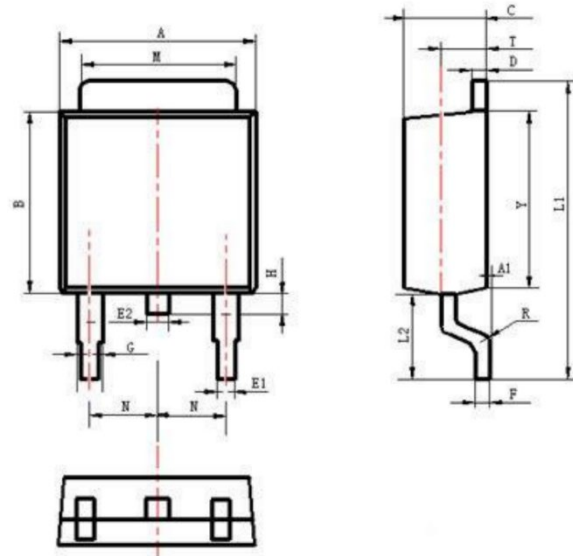






**PACKAGE INFORMATION**

Dimension in TO-252 (Unit: mm)

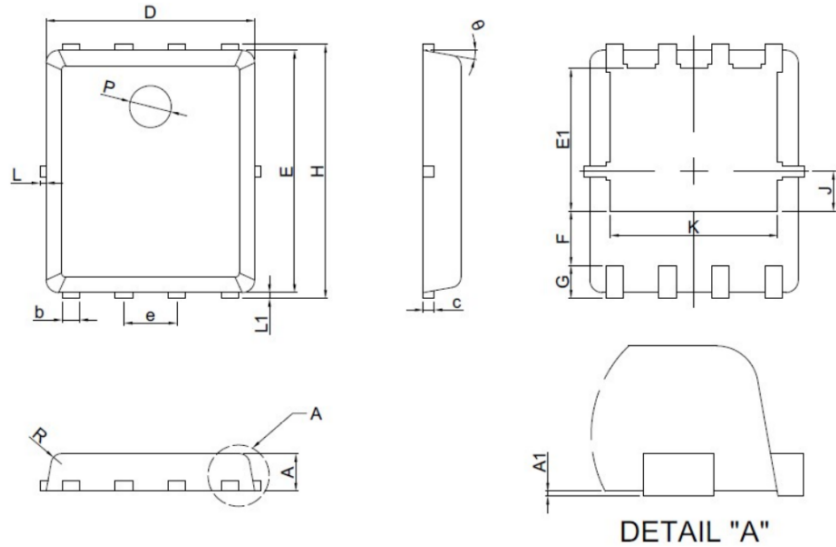


Symbol	Values	
	Min.	Max.
A	6.300	6.900
A1	0.000	0.130
B	5.700	6.300
C	2.100	2.500
D	0.300	0.600
E1	0.600	0.900
E2	0.700	1.000
F	0.300	0.600
G	0.700	1.200
H	0.600	1.000
L1	9.600	10.500
L2	2.700	3.100
M	5.100	5.500
N	2.090	2.490
R	0.300	0.300
T	1.400	1.600
Y	5.100	6.300





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



Symbol	MILLIMETERS	
	Min.	Max.
A	0.800	1.000
A1	0.000	0.050
b	0.350	0.490
c	0.254 REF	
D	4.900	5.100
E	5.700	5.900
E1	3.350	3.650
e	1.270 BSC	
F	1.400 REF	
G	0.600 REF	
H	5.950	6.200
J	0.950 BSC	
K	4.000 REF	
L	-	0.150
L1	0.100	0.180
P	1.000 REF	
R	0.250 REF	
θ	6°	14°



## IMPORTANT NOTICE

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