DESCRIPTION

The AM6512 is available in DFN8(5x6) package.

ORDERING INFORMATION

Package Type	Part Number	
DFN8 (5x6)	J8	AM6512J8R
		AM6512J8VR
Note	V: Halogen free Package R: Tape & Reel SPQ: 3,000pcs/ Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

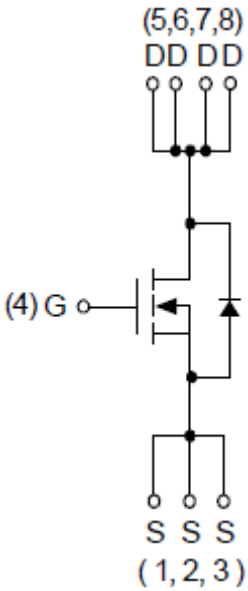
FEATURES

- 30V/100A,
  $R_{DS(ON)}$= 1.7mΩ (max.) @ V_{GS}=10V
  $R_{DS(ON)}$= 2.6mΩ (max.) @ V_{GS}=4.5V
- Reliable and Rugged
- 100% UIS Tested
- Available in DFN8(5x6) package.

APPLICATION

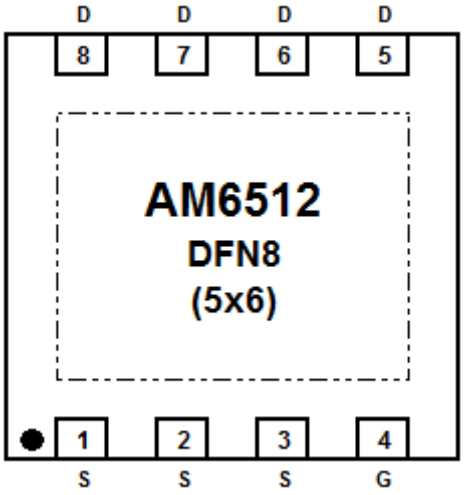
- Power Management in Notebook Computer or DC/DC Converters.
- Vcore Switching for Server
- Oring and Load Switch

PIN DESCRIPTION



N-Channel MOSFET

PIN DESCRIPTION



Top View

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

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless Otherwise Noted

V_{DSS}, Drain-Source Voltage		30V
V_{GSS}, Gate-Source Voltage		±20V
T_J, Maximum Junction Temperature		150°C
T_{STG}, Storage Temperature Range		-55°C~150°C
I_S, Diode Continuous Forward Current	T_C=25°C	100A NOTE1
I_D, Continuous Drain Current	T_C=25°C	100A NOTE1
	T_C=100°C	100A NOTE1
I_{DM}, Pulsed Drain Current	T_C=25°C	400A NOTE2
P_D, Maximum Power Dissipation	T_C=25°C	104W
	T_C=100°C	41W
$R_{\theta JC}$, Thermal Resistance-Junction to Case	Steady State	1.2°C/W
I_{DM}, Pulsed Drain Current	T_A=25°C	100A
I_D, Continuous Drain Current	T_A=25°C	25A
	T_A=70°C	20A
P_D, Maximum Power Dissipation	T_A=25°C	2.3W
	T_A=70°C	1.5W
$R_{\theta JA}$, Thermal Resistance-Junction to Ambient	t ≤10s	17°C/W
	Steady State	55°C/W
I_{AS} NOTE3, Avalanche Current, Single Pulse	L=0.5mH	42A
E_{AS} NOTE3, Avalanche Energy, Single Pulse	L=0.5mH	440mJ

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: Package is limited to 100A.

NOTE2: Pulse width limited by max. junction temperature.

NOTE3: UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_J=25°C).

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless Otherwise Noted

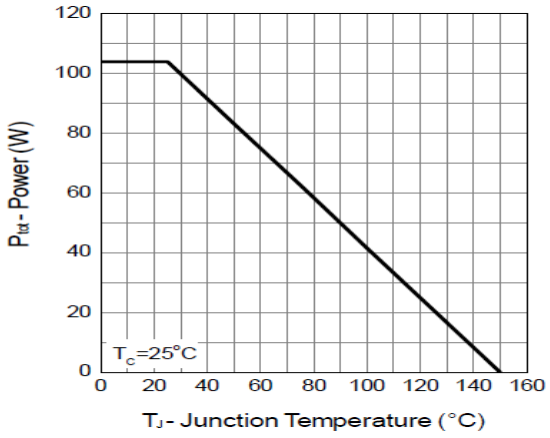
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_{DS}=-250μA	30	-	-	V
Drain-Source Breakdown Voltage (transient)	BV_{DSSt}	V_{GS}=0V, $I_{D(aval)}$=35A T_{case}=25°C, $t_{transient}$=100ns	34	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	1.3	1.8	2.5	V
Gate Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain-Source On-state Resistance	$R_{DS(ON)}$ NOTE4	V_{GS}=10V, I_{DS}=40A	-	1.35	1.7	mΩ
		T_J=125°C	-	2	-	
		V_{GS}=4.5V, I_{DS}=20A	-	2	2.6	
Forward Transconductance	Gfs	V_{DS}=5V, I_{DS}=20A	-	55	-	S
Diode Characteristics						
Diode Forward Voltage	V_{SD}NOTE4	I_{SD}=20A, V_{GS}=0V	-	0.77	1.1	V
Reverse Recovery Time	t_{rr}	I_F=20A, dI_{SD}/dt=100A/μs V_{DD}=15V	-	37	-	ns
Charge Time	t_a		-	21	-	
Discharge Time	t_b		-	16	-	
Reverse Recovery Charge	Q_{rr}		-	31	-	nC
Dynamic CharacteristicsNOTE5						
Gate Resistance	R_G	V_{GS}=0V, V_{DS}=0V,F=1MHz	0.7	1.0	1.8	Ω
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	3600	4500	5400	pF
Output Capacitance	C_{oss}		840	940	1050	
Reverse Transfer Capacitance	C_{rss}		330	430	530	
Turn-on Delay Time	$t_{d(ON)}$	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=1Ω	-	19	23	ns
Turn-on Rise Time	t_r		-	10	13	
Turn-off Delay Time	$t_{d(OFF)}$		-	56	67	
Turn-off Fall Time	t_f		-	34	40	
Gate Charge CharacteristicsNOTE5						
Total Gate Charge	Q_g	V_{DS}=15V, V_{GS}=4.5V, I_{DS}=40A	-	36	43	nC
Total Gate Charge	Q_g	V_{DS}=15V, V_{GS}=10V,I_{DS}=40A	-	78	93	
Threshold Gate Charge	Q_{gth}		-	2.8	3.3	
Gate-Source Charge	Q_{gs}		-	6.3	7.5	
Gate-Drain Charge	Q_{gd}		-	21	27	

NOTE4: Pulse test; pulse width≤300us, duty cycle≤2%

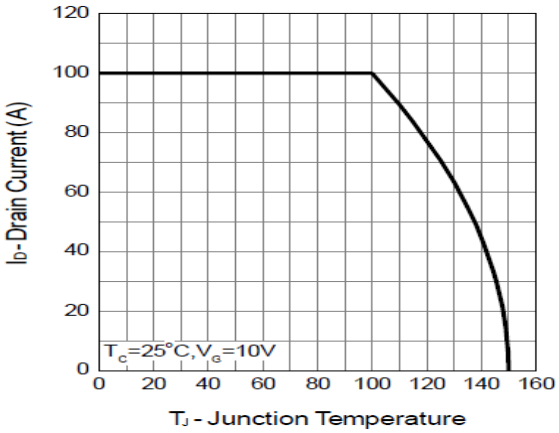
NOTE5: Guaranteed by design, not subject to production testing.

TYPICAL PERFORMANCE CHARACTERISTICS

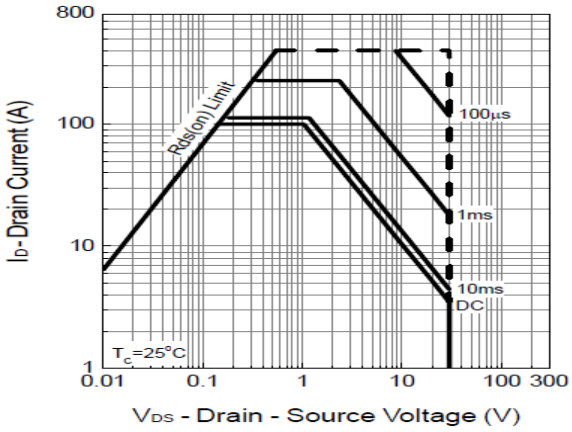
1. Power Dissipation



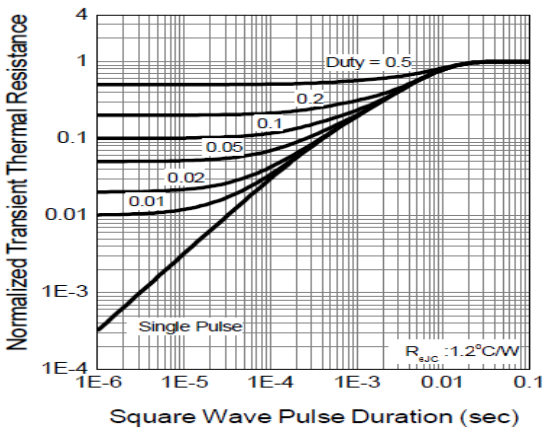
2. Drain Current



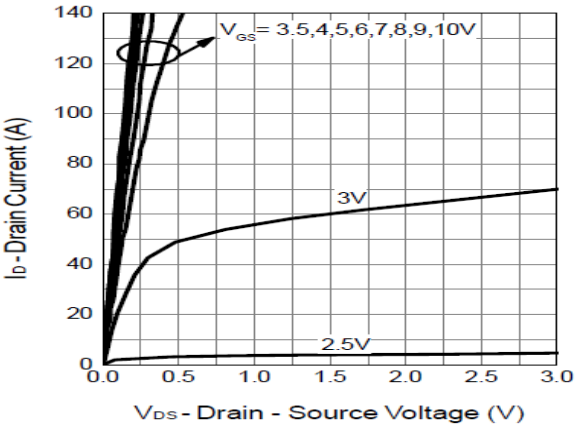
3. Safe Operation Area



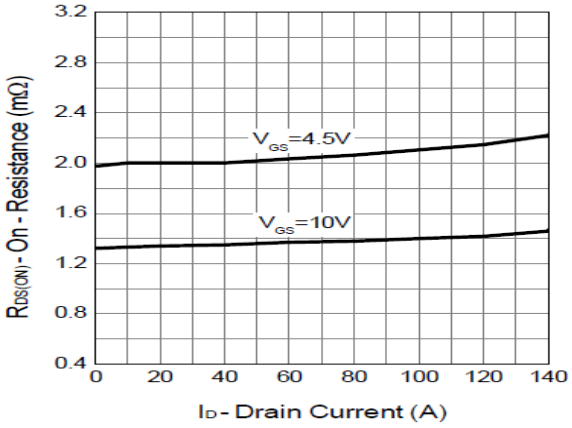
4. Thermal Transient Impedance



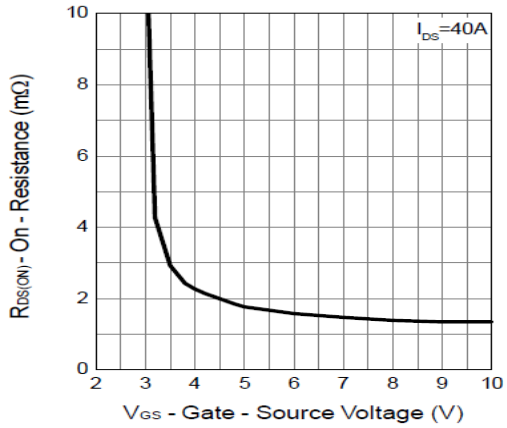
5. Output Characteristics



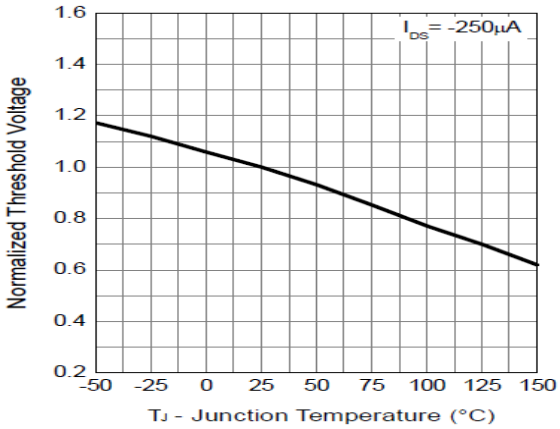
6. Drain-Source On Resistance



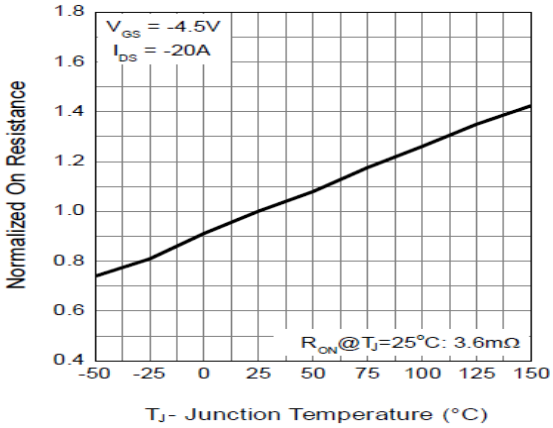
7. Gate-Source On Resistance



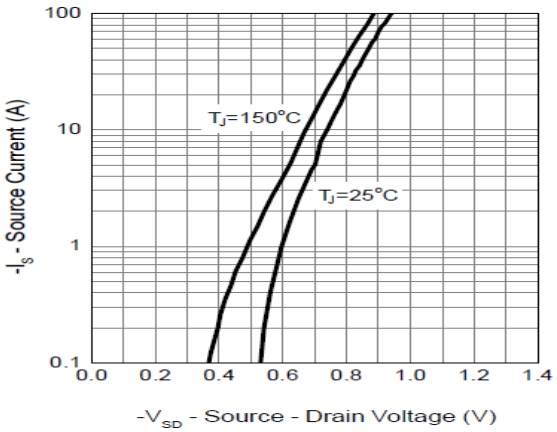
8. Gate Threshold Voltage



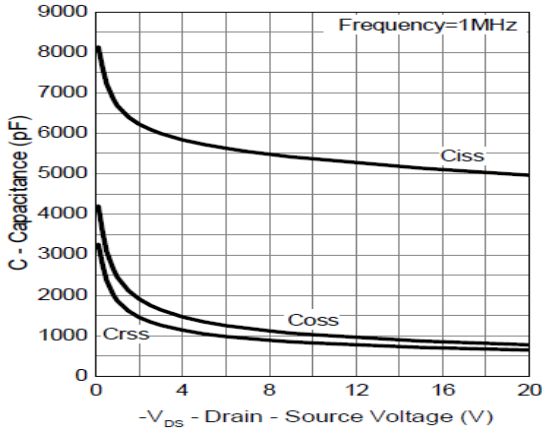
9. Drain-Source On Resistance



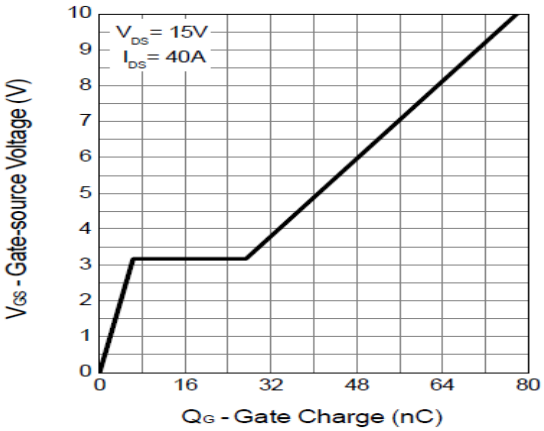
10. Source-Drain Diode Forward



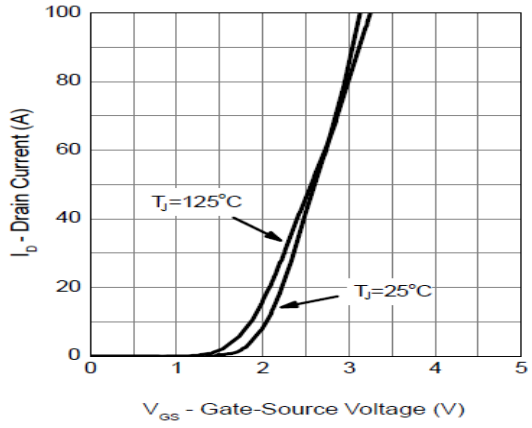
11. Capacitance



12. Gate Charge

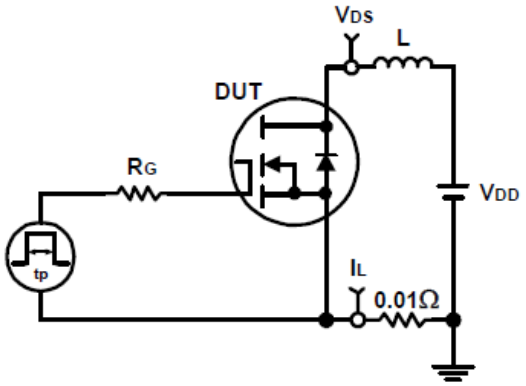


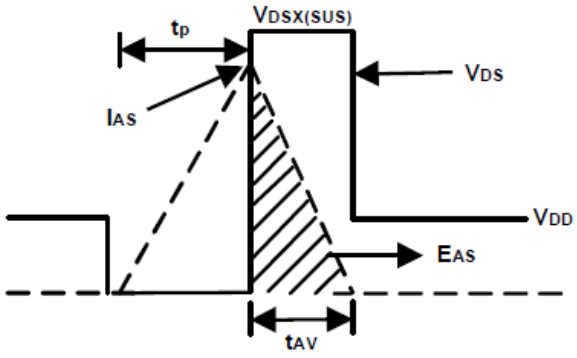
13. Transfer Characteristics



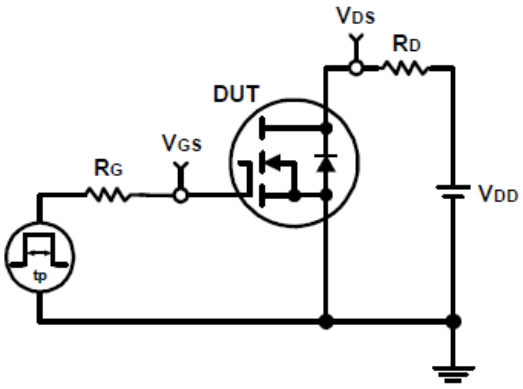
DETAILED INFORMATION

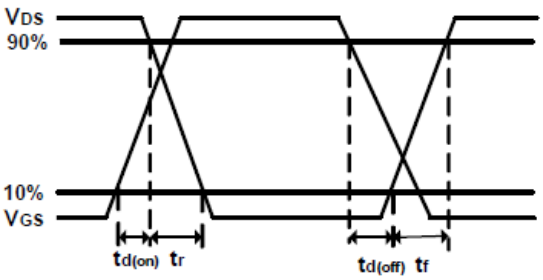
Avalanche Test Circuit and Waveforms





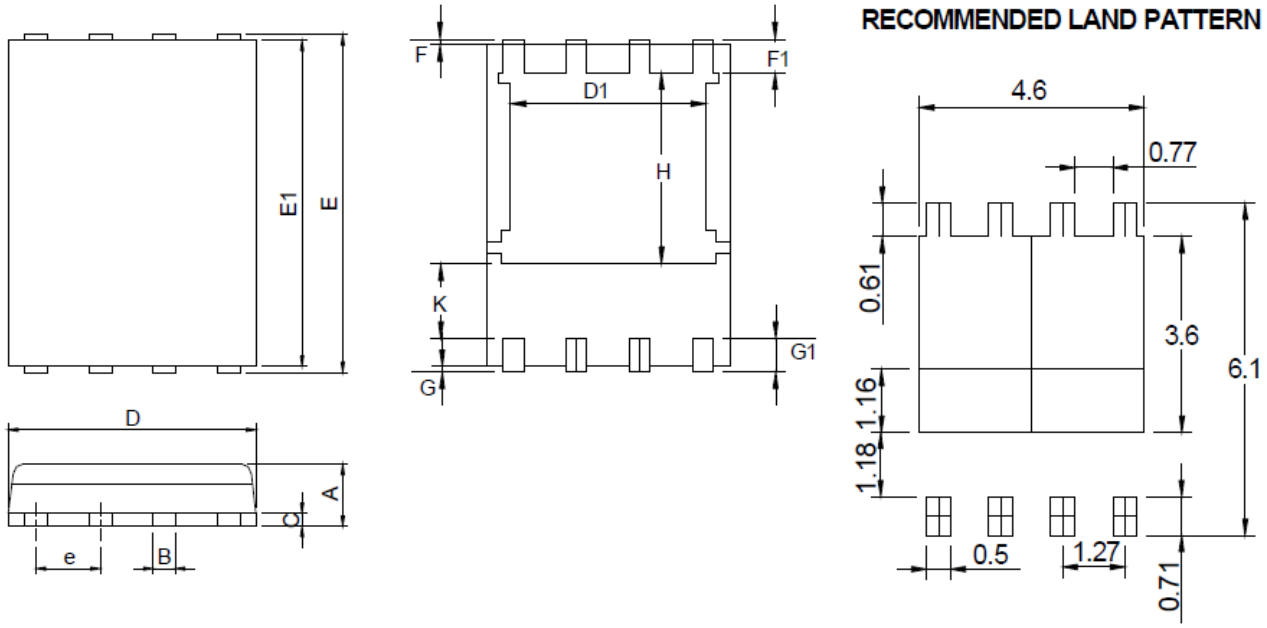
Switching Time Test Circuit and Waveforms





PACKAGE INFORMATION

Dimension in DFN8 (Unit: mm)



Symbol	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.90	1.20	0.035	0.047
B	0.3	0.51	0.012	0.020
C	0.19	0.25	0.007	0.010
D	4.80	5.30	0.189	0.209
D1	4.00	4.40	0.157	0.173
E	5.90	6.20	0.232	0.244
E1	5.50	5.80	0.217	0.228
e	1.27 BSC		0.050 BSC	
F	0.05	0.30	0.002	0.012
F1	0.35	0.75	0.014	0.030
G	0.05	0.30	0.002	0.012
G1	0.35	0.75	0.014	0.030
H	3.34	3.9	0.131	0.154
K	0.762	-	0.03	-

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