



## DESCRIPTION

The AM8814 is the Dual N-Channel logic enhancement mode power field effect transistor which is produced using high cell density advanced trench technology to provide excellent  $R_{DS(ON)}$ .

This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application, and low in-lin power loss are needed in a very small outline surface mount package

AM8814 is available in TSSOP8 package.

## ORDERING INFORMATION

Package Type	Part Number	
TSSOP8	TMX8	AM8814TMX8R
		AM8814TMX8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products Suffix " V " means Halogen free Package		

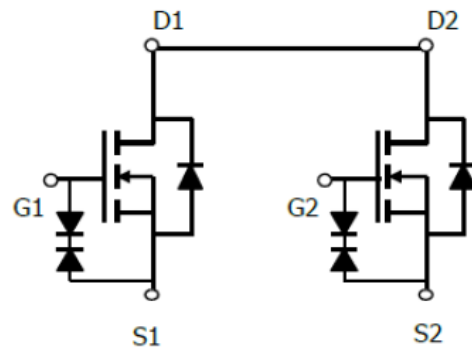
## FEATURES

- 20V/7.5A,  $R_{DS(ON)}=12.5m\Omega(\text{typ.})@V_{GS}=4.5V$
- 20V/5.5A,  $R_{DS(ON)}=16m\Omega(\text{typ.})@V_{GS}=2.5V$
- Super high design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and Maximum DC current capability
- ESD Rating : 2000V HBM
- Available in TSSOP8 package.

## APPLICATION

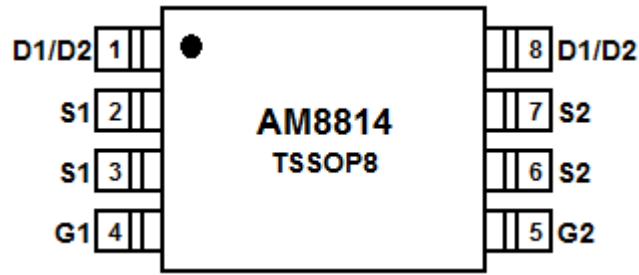
- Power Management in Note Book
- Portable Equipment
- Battery Powered System

## PIN DESCRIPTION





## PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	D1/D2	Drain
2	S1	Source
3	S1	Source
4	G1	Gate
5	G2	Gate
6	S2	Source
7	S2	Source
8	D1/D2	Drain



## ABSOLUTE MAXIMUM RATINGS

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

V <sub>DSS</sub> , Drain-Source Voltage		20V
V <sub>GSS</sub> , Gate-Source Voltage		±12V
I <sub>D</sub> , Continuous Drain Current(V <sub>GS</sub> =10V)	T <sub>A</sub> =25°C	7.0A
	T <sub>A</sub> =75°C	6.0A
I <sub>DM</sub> , Pulsed Drain Current		30A
I <sub>S</sub> , Continuous Source Current (Diode Conduction)		1A
P <sub>D</sub> , Power Dissipation	T <sub>A</sub> =25°C	1.5W
	T <sub>A</sub> =75°C	1.0W
T <sub>J</sub> , Operation Junction Temperature		150°C
T <sub>STG</sub> , Storage Temperature Range		-55°C~150°C

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.

## THERMAL CHARACTERISTIC

Parameter	Symbol	Limit	Units
Thermal Resistance-Junction to Ambient <sup>NOTE2</sup>	R <sub>θJA</sub>	62.5	°C/W



## ELECTRICAL CHARACTERISTICS

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

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	20	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	0.4	0.6	1.0	V
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±10V	-	-	±10	μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V	-	-	1	μA
		V <sub>DS</sub> =16V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C	-	-	5	
On=State Drain Current	I <sub>D(ON)</sub>	V <sub>DS</sub> ≥5V, V <sub>GS</sub> =4.5V	7.5	-	-	A
Drain-Source On- Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =7.5A	10	12	16	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =7A	11	12.5	18	
		V <sub>GS</sub> =3.6V, I <sub>D</sub> =6.5A	12	14	20	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.5A	13	16.5	24	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =5A	20	24	34	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =7A	-	31	-	S
<b>Source-Drain Diode</b>						
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1.0A, V <sub>GS</sub> =0V	-	0.7	1.3	V
<b>Dynamic Parameters</b>						
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =7.0A	-	16	-	nC
Gate-Source Charge	Q <sub>GS</sub>		-	1.7	-	
Gate-Drain Charge	Q <sub>GD</sub>		-	6.8	-	
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHZ	-	1120	-	nC
Output Capacitance	C <sub>OSS</sub>		-	1950	-	
Reverse Transfer Capacitance	C <sub>RSS</sub>		-	155	-	
Turn-on Delay Time	t <sub>D(ON)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =7.0A, V <sub>GEN</sub> =5V, R <sub>G</sub> =3.3Ω	-	7.2	-	ns
Turn-on Rise Time	t <sub>r</sub>		-	11	-	
Turn-off Delay Time	t <sub>D(OFF)</sub>		-	64	-	
Turn-off Fall Time	t <sub>f</sub>		-	32	-	

NOTE1: Pulse test: pulse width≤300μs, duty cycle≤2%

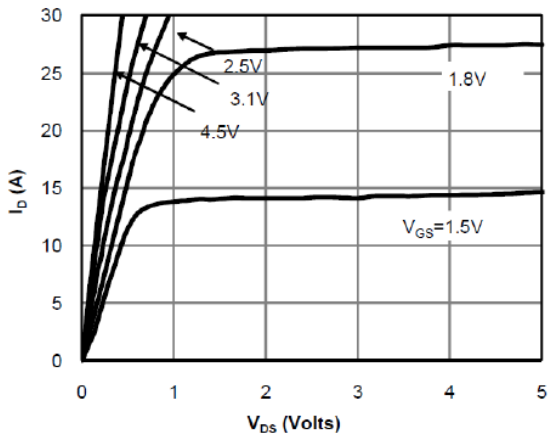
NOTE2: Static parameters are based on package level with recommended wire bonding



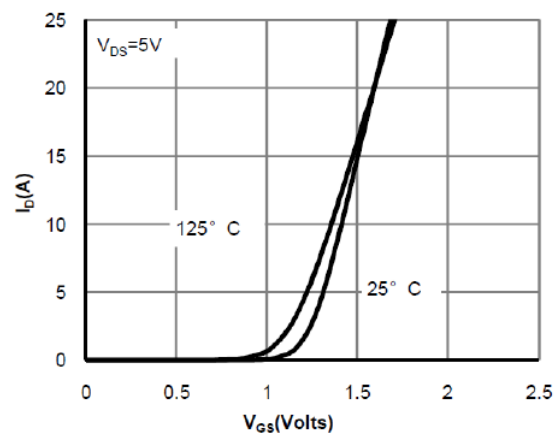
## TYPICAL CHARACTERISTICS

25°C, unless noted

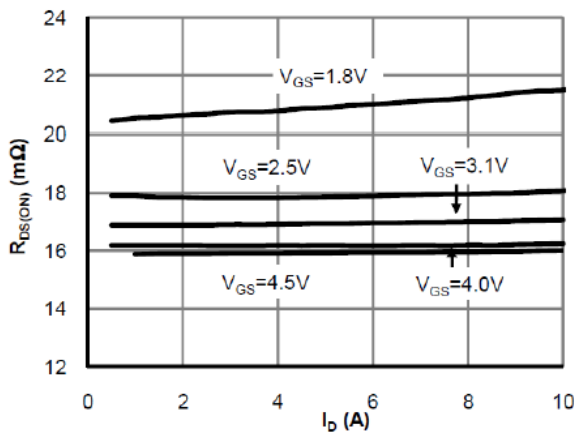
### 1. On-Region Characteristics (Note E)



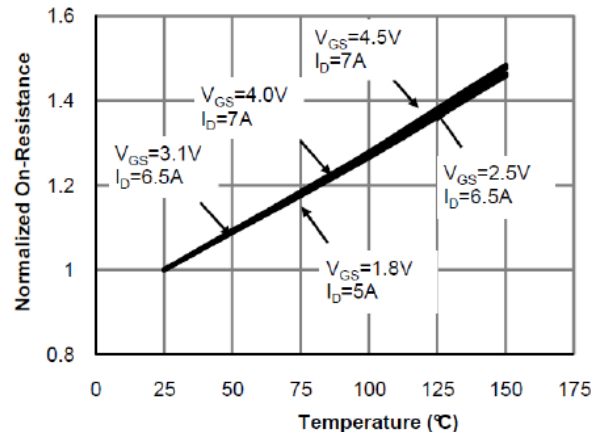
### 2. Transfer Characteristics (Note E)



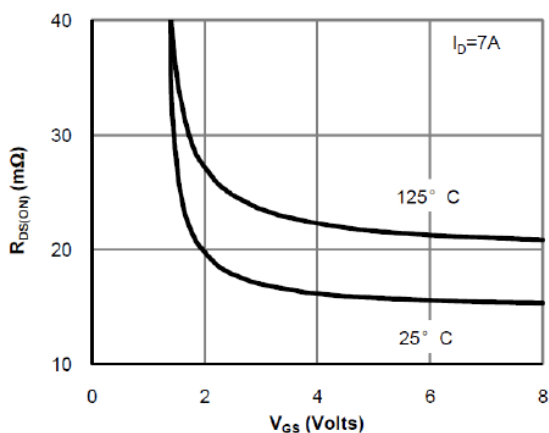
### 3. On-Resistance vs. Drain Current and Gate Voltage (Note E)



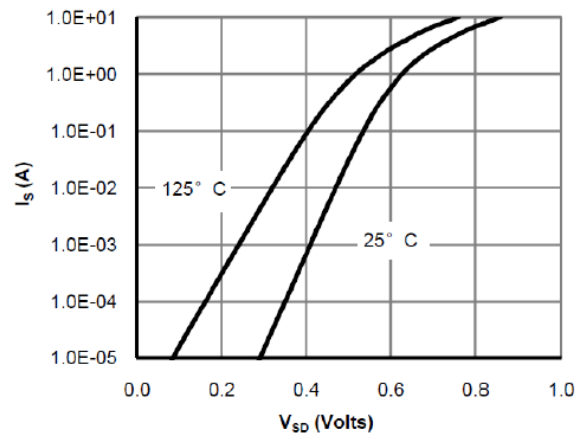
### 4. On-Resistance vs. Junction Temperature (Note E)



### 5. On-Resistance vs. Gate-Source Voltage (Note E)

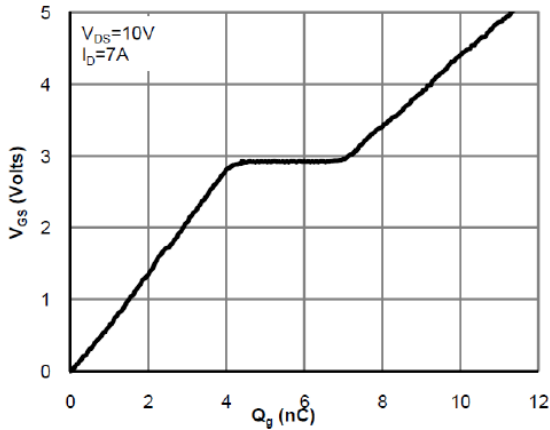


### 6. Body-Diode Characteristics (Note E)

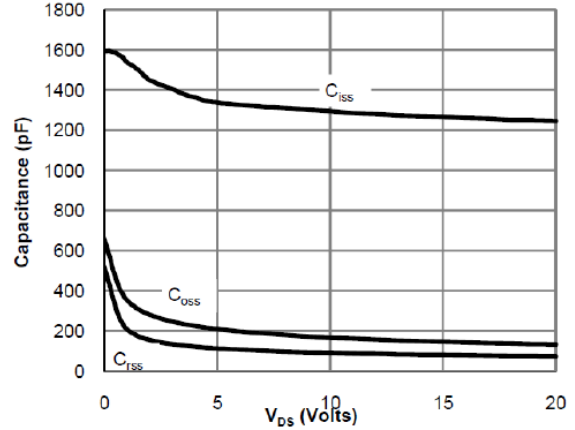




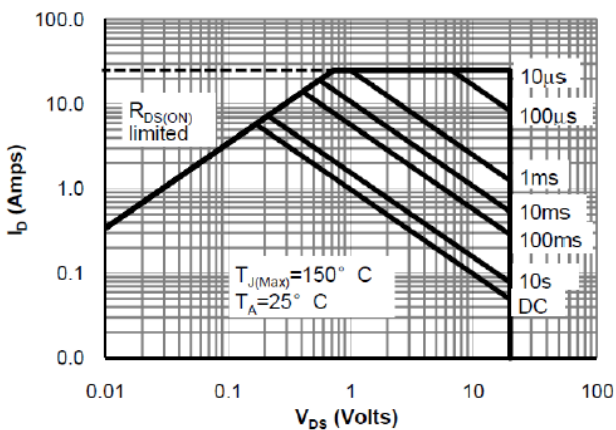
7. Gate-Charge Characteristics



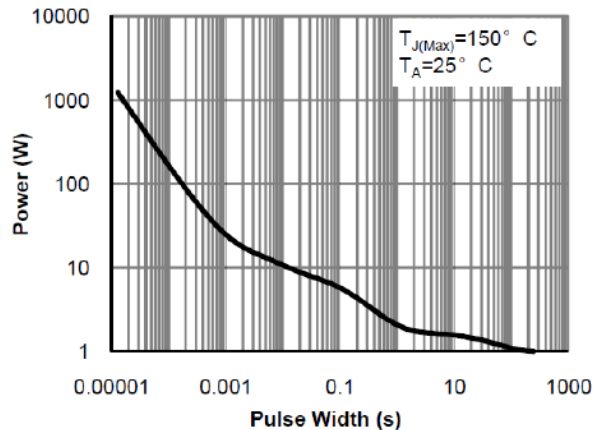
8. Capacitance Characteristics



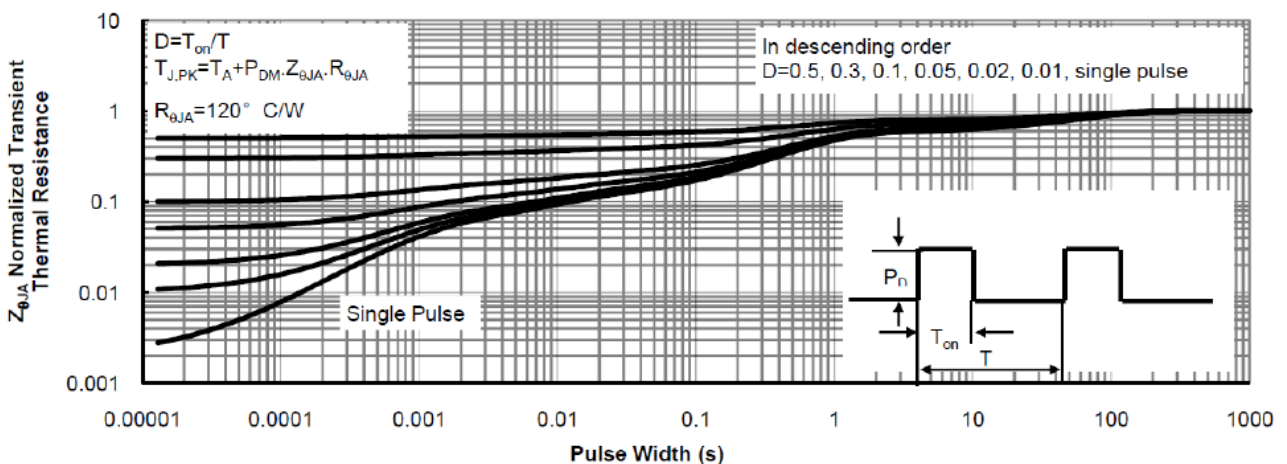
9. Maximum Forward Biased Safe Operating Area (Note F)



10. Single Pulse Power Rating Junction-to-Ambient (Note F)



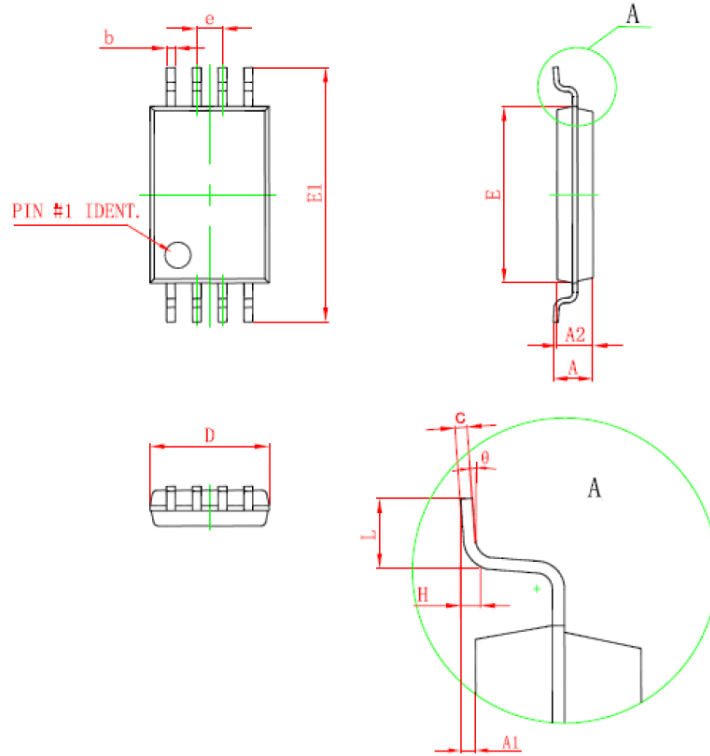
11. Normalized Maximum Transient Thermal Impedance (Note F)





**PACKAGE INFORMATION**

Dimension in TSSOP8 (Unit: mm)



Symbol	Min	Max
D	2.900	3.100
E	4.300	4.500
b	0.190	0.300
c	0.090	0.200
E1	6.250	6.550
A	-	1.100
A2	0.800	1.000
A1	0.020	0.150
e	0.650(BSC)	
L	0.500	0.700
H	0.250(TYP)	
θ	1°	7°



## IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc.'s integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or severe property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.