

**DESCRIPTION**

The AM80R750TF is available in the TO-220F Package.

VDSS	RDS(ON)	ID
800V	0.75Ω	7A

**APPLICATIONS**

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

**ORDERING INFORMATION**

Package Type	Part Number	
TO-220F SPQ: 50pcs /Tube 1,000pcs/Box	T3F	AM80R750T3FU
Note	U: Tube Package	
AiT provides all RoHS products		

**FEATURES**

- 800V, 7A
- $R_{DS(ON)}=750m\Omega$  (Max.) @  $V_{GS}=10V$ ,  $I_D=3.5A$
- Very low FOM  $R_{DS(ON)} \times Q_g$
- Extremely low switching loss
- Good stability and uniformity

**PIN DESCRIPTION**

Pin#	Symbol	Function
1	G	Gate
2	D	Drain
3	S	Source

**ABSOLUTE MAXIMUM RATINGS**

$T_C=25^{\circ}C$ , unless otherwise Noted

$V_{DSS}$ , Drain-Source Voltage	800V
$V_{GSS}$ , Gate-Source Voltage	$\pm 30V$
$I_D$ , Continue Drain Current	$T_C=25^{\circ}C$ 7A
$I_{DM}$ , Pulsed Drain Current <sup>(1)</sup>	21A
$E_{AS}$ , Single Pulse Avalanche Energy <sup>(2)</sup>	120mJ
$dv/dt$ , MOSFET $dv/dt$ Ruggedness ( $V_{DS}=0\sim 400V$ )	40V/ns
$dv/dt$ , Peak Diode Recovery $dv/dt$ <sup>(3)</sup>	15 V/ns
$P_D$ , Power Dissipation	$T_C=25^{\circ}C$ 48W
$T_J$ , Operating Temperature Range	$-55^{\circ}C\sim +150^{\circ}C$
$T_{STG}$ , Storage Temperature Range	$-55^{\circ}C\sim +150^{\circ}C$
$R_{\theta JC}$ , Thermal Resistance, Junction to Case	2.6°C/W
$R_{\theta JA}$ , Thermal Resistance, Junction to Ambient	67°C/W

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 junction temperature.
2.  $L = 60mH$ ,  $I_{AS} = 2A$ ,  $V_{DD} = 50V$ ,  $R_G=25\Omega$ , Starting at  $T_J = 25^{\circ}C$
3.  $I_{SD} \leq I_D$ ,  $di/dt = 100A/us$ ,  $V_{DD} \leq 400V$ , Starting at  $T_J = 25^{\circ}C$



## ELECTRICAL CHARACTERISTICS

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

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Off Characteristic						
Drain Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	800	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 800V, V <sub>GS</sub> =0V	-	-	1	μA
Gate to Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> =±30V	-	-	±100	nA
On Characteristic						
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =3.5A	-	650	750	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	3.0	3.5	4.0	V
Gate Resistance	R <sub>g</sub>	V <sub>DS</sub> =0V, f=1MHz	-	7.2	-	Ω
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 3.5A	-	9.4	-	S
Dynamic Characteristic						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, f=0.1MHz	-	718	-	pF
Output Capacitance	C <sub>oss</sub>		-	34	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	1.1	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DD</sub> = 640V, I <sub>D</sub> =7A, V <sub>GS</sub> =10V	-	17.3	-	nC
Gate-Source charge	Q <sub>gS</sub>		-	3.6	-	
Gate-Drain (“Miller”) Charge	Q <sub>gd</sub>		-	6.4	-	
Switching Characteristic						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 325V, R <sub>G</sub> =25Ω V <sub>GS</sub> = 10V, I <sub>D</sub> =7A	-	17.3	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	25	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	75	-	
Turn-Off Fall Time	t <sub>f</sub>		-	22	-	
Drain Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current	I <sub>S</sub>	-	-	-	7	A
Maximum Pulsed Drain to Source Diode Forward Current	I <sub>SM</sub>	-	-	-	21	A
Drain to Source Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>SD</sub> =7A	-	0.9	1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>S</sub> =7A, di/dt=100A/μs	-	239	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	2.35	-	uC



## TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Output Characteristics

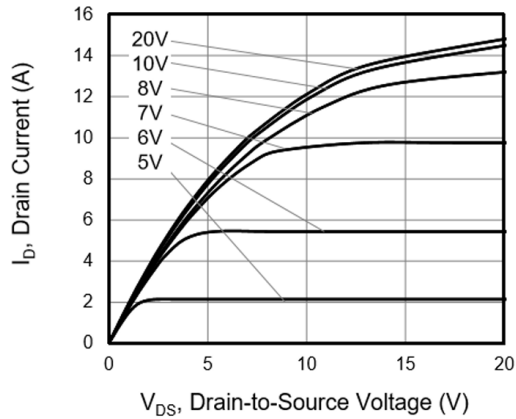


Fig 2. Transfer Characteristics

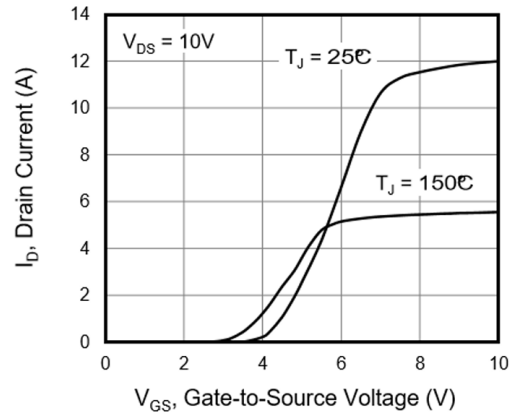


Fig 3. On-resistance vs. Drain Current

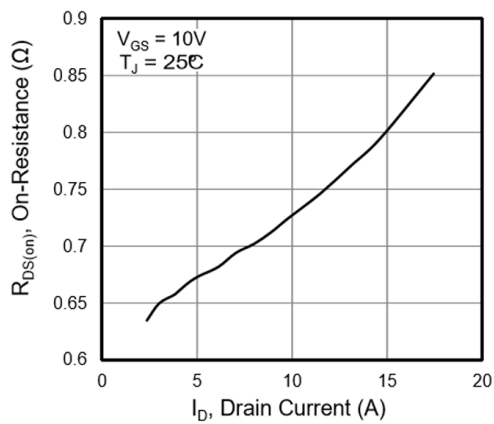


Fig 4. Body Diode Characteristics

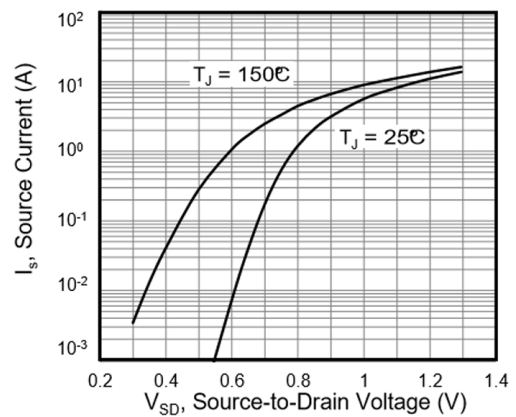


Fig 5. Gate Charge Characteristics

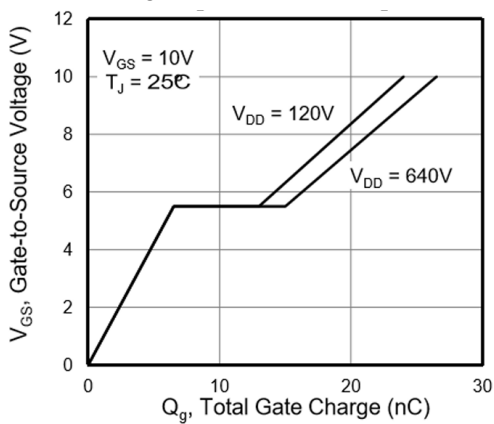


Fig 6. Capacitance Characteristic

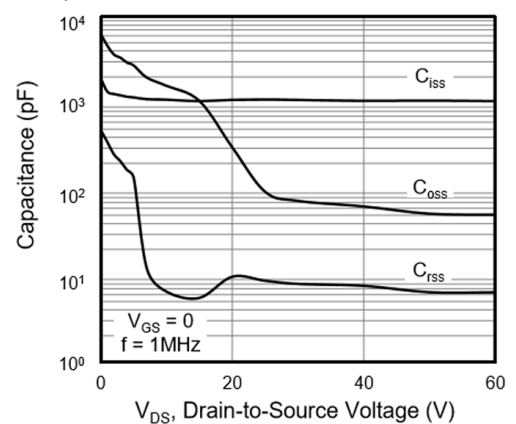




Fig 7. Threshold Voltage vs. Junction Temperature

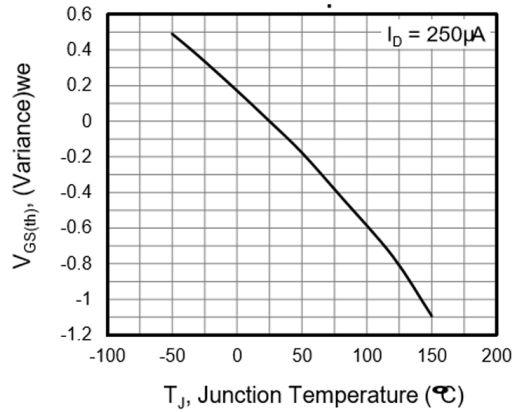


Fig 8. Safe Operation Area

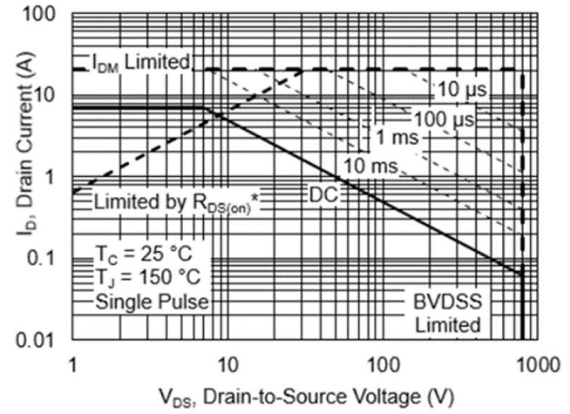
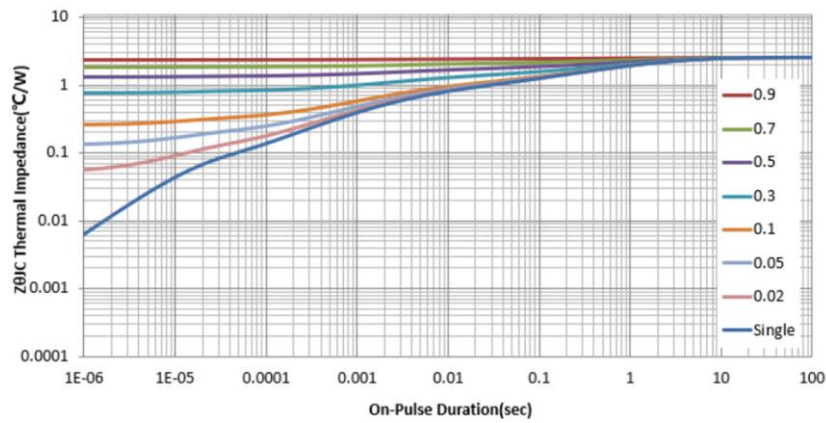


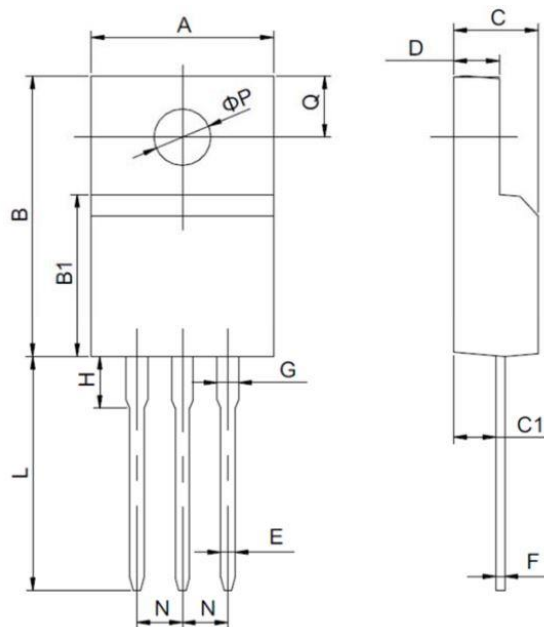
Fig 9. Maximum Effective Transient Thermal, Junction-to-Case





## PACKAGE INFORMATION

Dimension in TO-220F (Unit: mm)



Symbol	Min.	Max.
A	9.600	10.400
B	15.400	16.200
B1	8.900	9.500
C	4.300	4.900
C1	2.100	3.000
D	2.400	3.000
E	0.600	1.000
F	0.300	0.600
G	1.120	1.420
H	1.600	3.800
L	12.000	14.000
N	2.340	2.740
Q	3.150	3.550
ΦP	2.900	3.300



## 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. 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 server 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.