DESCRIPTION

The AM80R330TF is available in the TO-220F Package.

BV_{DSS}	$R_{DS(ON)}$	I_D
800V	0.33Ω	13A

APPLICATIONS

- Power factor correction (PFC).
- Switched mode power supplies (SMPS).
- Uninterruptible power supply (UPS)

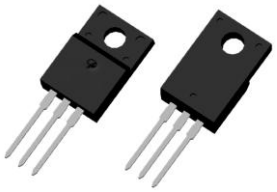
ORDERING INFORMATION

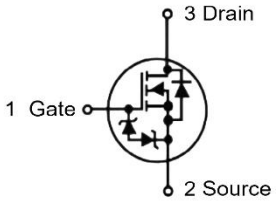
Package Type	Part Number	
TO-220F SPQ: 50pcs/Tube 1,000pcs /Box	T3F	AM80R330T3FVU
Note	V: Halogen free Package U: Tube Package	
AiT provides all RoHS products		

FEATURES

- Fast switching
- Low on resistance
- Low gate charge
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100% ΔVDS test

PIN DESCRIPTION





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

ABSOLUTE MAXIMUM RATINGS

T_C=25℃, unless otherwise Noted

V_{DSS}, Drain-to-Source Voltage		800V
V_{GSS}, Gate-to-Source Voltage		±20V
I_D, Continuous Drain Current	T_C = 25°C	13A
	T_C = 100°C	8.2A
I_{DM}, Pulsed Drain Current (1)		39A
E_{AS}, Single Pulse Avalanche Energy (2)		171mJ
I_{AR}, Repetitive Avalanche Current		2A
dv/dt, MOSFET dv/dt ruggedness, V_{DS}=0V~400V		50V/ns
dv/dt,Reverse Diode dv/dt, Vds=0V~400V, I_{DS}≦I_D		15V/ns
P_{tot}, Power Dissipation	T_a = 25°C	2W
	T_C = 25°C	32W
$R_{\theta JC}$, Thermal Resistance, Junction to Case		3.91℃/W
$R_{\theta JA}$, Thermal Resistance, Junction to Ambient		62.5℃/W
V_{ISO}, Isolation Voltage		2500V
$V_{ESD(G-S)}$, Gate-Source ESD (HBM-C=100p, R=1.5KΩ)		2000V
T_{STG}, Storage Temperature Range		-55℃ ~ +150℃
T_J, Junction Temperature Range		-55℃ ~ +150℃

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=10mH, V_{DD}=50V, V_{GS}=10V, R_G=25Ω, V_{GATE}=800V, Start T_J=25℃

ELECTRICAL CHARACTERISTICS

T_C = 25°C, unless otherwise Noted

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Off Characteristics						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D = 250μA	800	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=800V, V_{GS}=0V, T_C = 25°C	-	-	1	μA
		V_{DS}=800V, V_{GS}=0V, T_C = 150°C	-	-	100	
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}= ±20V	-	-	±1	μA
On Characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D = 250μA	2	-	4	V
Drain-to-Source on-state Resistance (1)	$R_{DS(ON)}$	V_{GS} =10V, I_D = 3.4A	-	0.33	0.38	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=500V, V_{GS}=0V, f=1.0MHZ	-	1250	-	pF
Output Capacitance	C_{oss}		-	26	-	
Reverse Transfer Capacitance	C_{rss}		-	3.4	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=400V, R_G=25Ω, V_{GS}=10V, I_D = 6.2A	-	29	-	ns
Turn-On Rise Time	t_r		-	21	-	
Turn-Off Delay Time	$t_{d(off)}$		-	136	-	
Turn-Off Fall Time	t_f		-	17	-	
Total Gate Charge	Q_g	V_{DD} = 640V , I_D =6.2A V_{GS}= 10V	-	29	-	nC
Gate-Source Charge	Q_{gs}		-	5.3	-	
Gate-Drain Charge	Q_{gd}		-	8.9	-	
Drain-Source Diode Characteristics						
Diode Forward Current	I_S	-		-	13	A
Diode Forward Voltage *	V_{FSD}	V_{GS}=0V, I_S=6.2A	-	-	1.20	V
Reverse Recovery Time *	trr	I_F = 6.2A, T_J = 25°C di/dt = 100A/us	-	260	-	ns
Reverse Recovery Charge	Qrr		-	2700	-	nC

* Pulse test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%.

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. On Region Characteristics

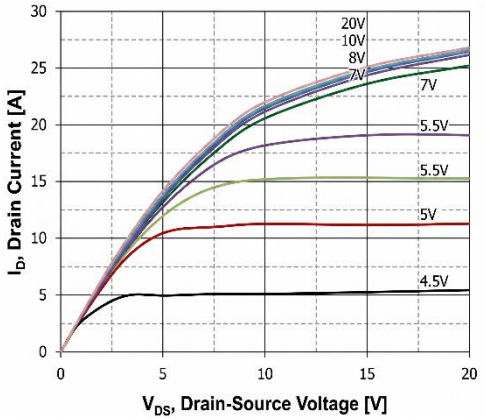


Fig 2. Transfer Characteristics

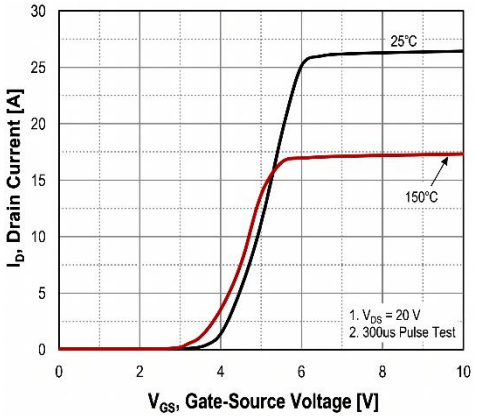


Fig 3. On-Resistance Variation vs. Drain Current and Gate Voltage

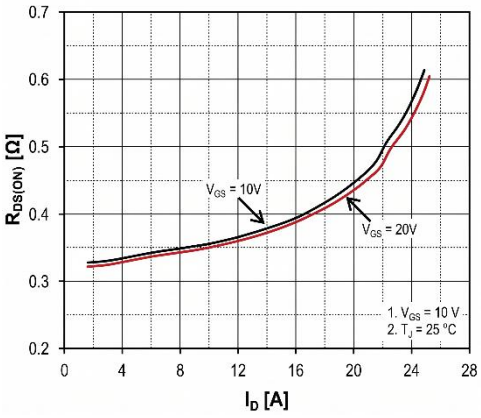


Fig 4. Body Diode Forward Voltage Variation with Source Current and Temperature

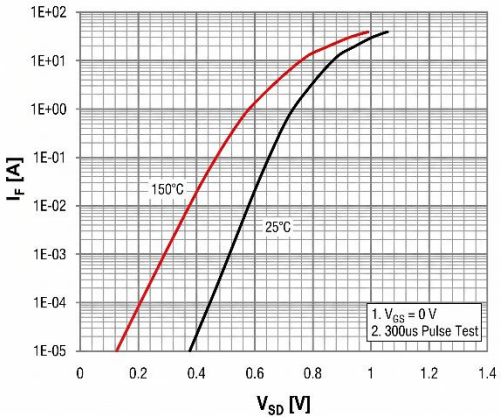


Fig 5. Capacitance Characteristics

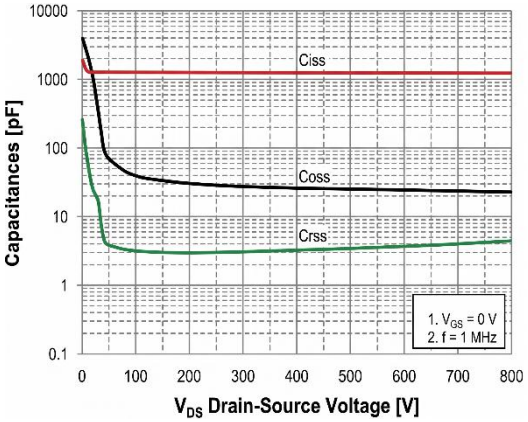


Fig 6. Gate Charge Characteristics

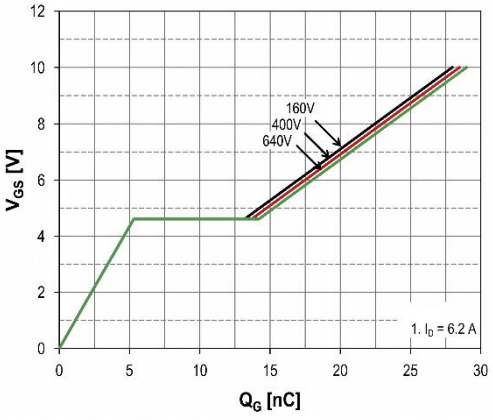


Fig 7. Breakdown Voltage Variation vs. Temperature

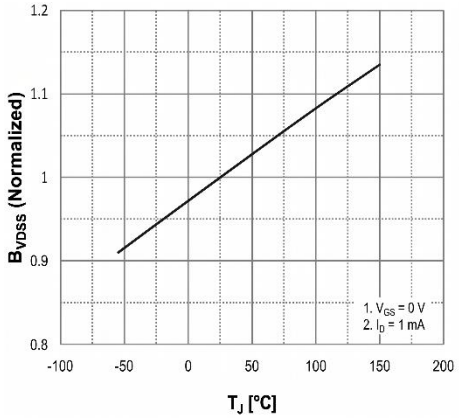


Fig 8. On-Resistance Variation vs. Temperature

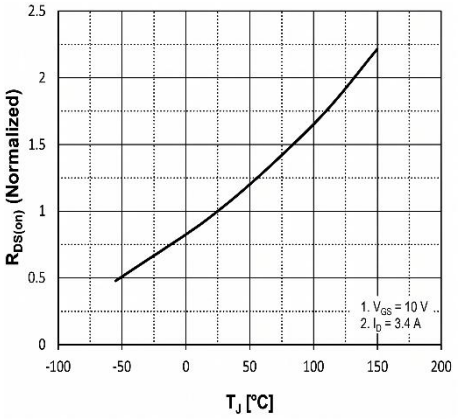


Fig 9. Maximum Safe Operating Area

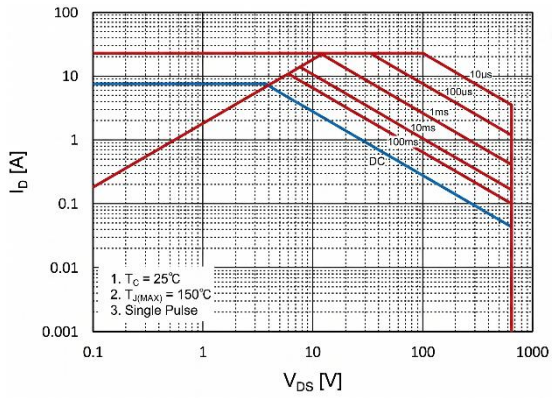


Fig 10. Maximum Drain Current vs. Case Temperature

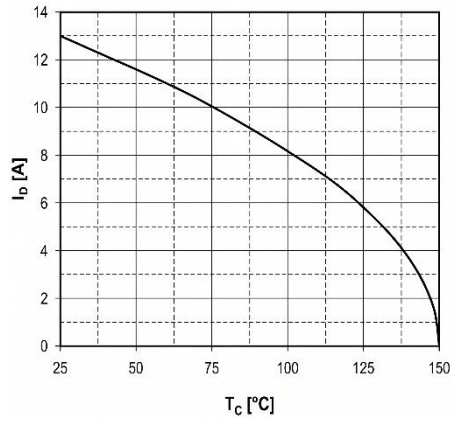


Fig 11. Transient Thermal Response Curve

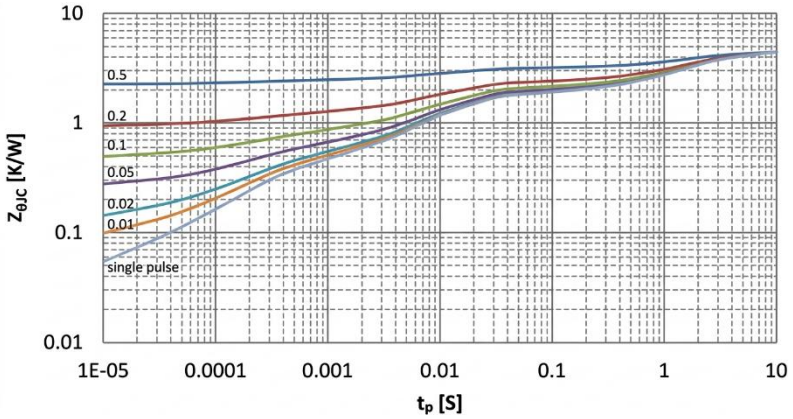


Fig 13. Gate Charge Test Circuit & Waveform

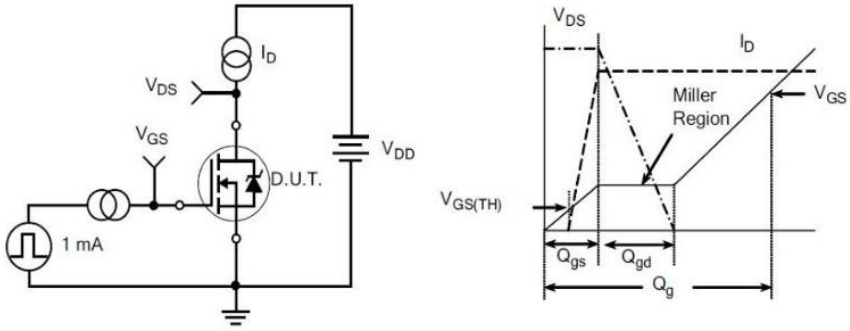


Fig 14. Resistive Switching Test Circuit & Waveform

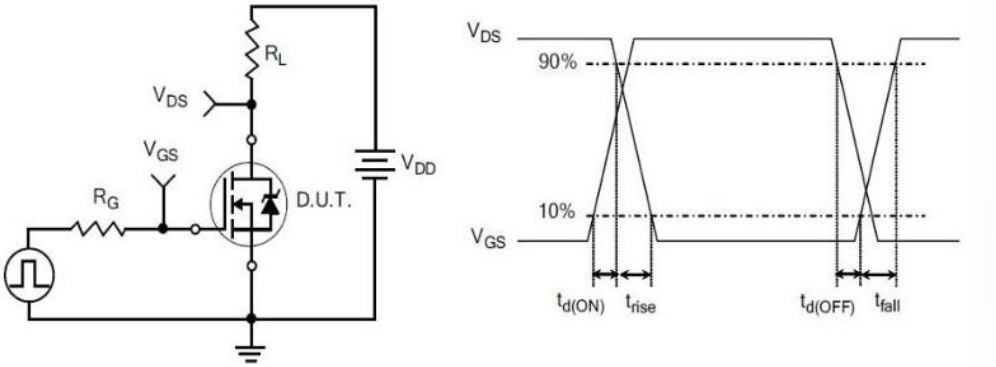


Fig 15. Diode Recovery Test Circuit & Waveform

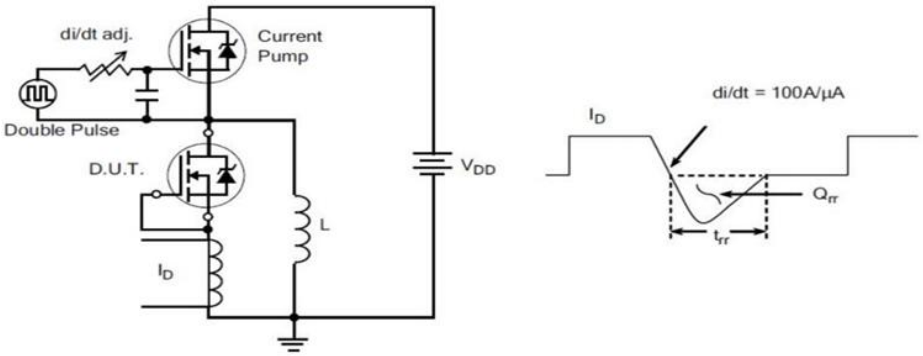
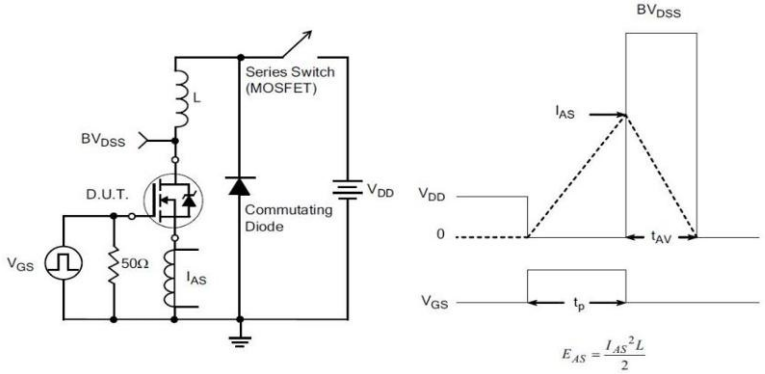


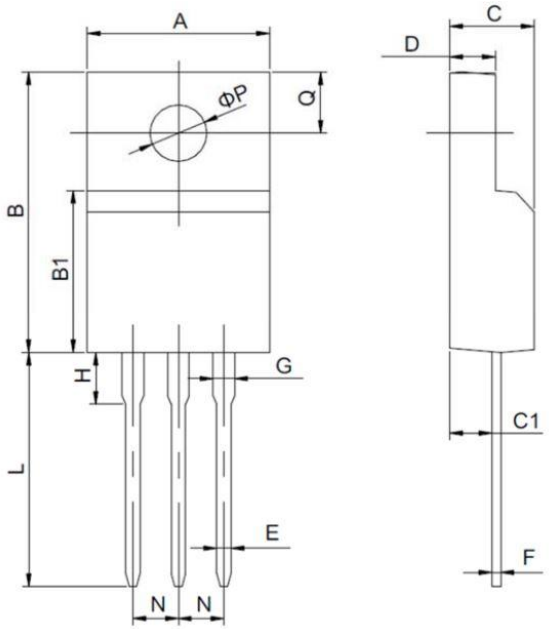
Fig 16. Unclamped Inductive Switching Test Circuit& Waveform



$$E_{AS} = \frac{I_{AS}^2 L}{2}$$

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

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