



**DESCRIPTION**

The AM70R600 is available in TO-220, TO-220F and TO-252 packages.

BVDSS	RDSON	ID
700V	0.54Ω	8A

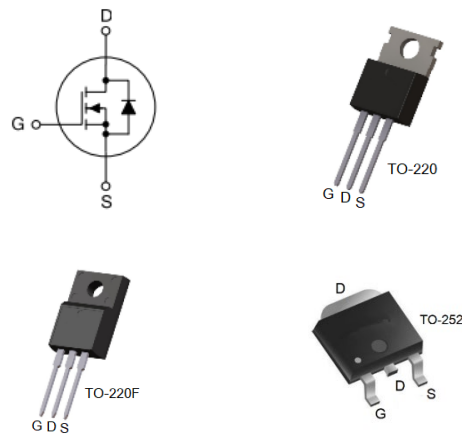
Application:

High frequency switching mode power supply

**FEATURE**

- Fast Switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product

**PIN DESCRIPTION**



**ORDERING INFORMATION**

Package Type	Part Number	
TO-220 SPQ: 50pcs/Tube	T3	AM70R600T3VU
TO-220F SPQ: 50pcs/Tube	T3F	AM70R600T3FVU
TO-252 SPQ: 2,500pcs/Reel	D	AM70R600DVR
Note	U: Tube R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

Pin#		Symbol	Function
TO-220	TO-252		
1	1	G	Gate
2	2,4	D	Drain
3	3	S	Source

**ABSOLUTE MAXIMUM RATINGS**

$T_C = 25^\circ\text{C}$ , unless otherwise specified.

$V_{DSS}$ , Drain-to-Source Voltage		700V
$I_D$ , Continuous Drain Current		8A
$I_D$ , Continuous Drain Current $T_C = 100^\circ\text{C}$		5A
$I_{DM}$ , Pulsed Drain Current <sup>(1)</sup>		24A
$V_{GS}$ , Gate-to-Source Voltage		$\pm 30\text{V}$
$E_{AS}$ , Single Pulse Avalanche Energy <sup>(2)</sup>		145mJ
$dv/dt$ , Peak Diode Recovery $dv/dt$ <sup>(3)</sup>		15V/ns
$P_D$ , Power Dissipation	TO-220, TO-252	90W
	TO-220F	28W
$P_D$ , Derating Factor above $25^\circ\text{C}$	TO-220, TO-252	0.73W/ $^\circ\text{C}$
	TO-220F	0.22W/ $^\circ\text{C}$
$T_J$ , Operating Junction Temperature Range		$150^\circ\text{C}$
$T_{STG}$ , Storage Temperature Range		$-55^\circ\text{C}\sim+150^\circ\text{C}$
$T_L$ , Maximum Temperature for Soldering		$300^\circ\text{C}$
$R_{\theta JA}$ , Junction-to-Ambient	TO-220, TO-252	62.5 $^\circ\text{C}/\text{W}$
	TO-220F	80 $^\circ\text{C}/\text{W}$
$R_{\theta JC}$ , Junction-to-Case	TO-220, TO-252	1.39 $^\circ\text{C}/\text{W}$
	TO-220F	4.6 $^\circ\text{C}/\text{W}$

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) Pulse width limited by maximum junction temperature

(2)  $L=20\text{mH}$ ,  $V_{DS}=50\text{V}$ , Start  $T_J=25^\circ\text{C}$

(3)  $I_{SD}=3\text{A}$ ,  $di/dt \leq 100\text{A}/\mu\text{s}$ ,  $V_{DD} \leq B_{VDS}$ , Start  $T_J=25^\circ\text{C}$



**ELECTRICAL CHARACTERISTICS**

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

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
<b>OFF Characteristics</b>						
Drain to Source Breakdown Voltage	V <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	700	-	-	V
BV <sub>DSS</sub> Temperature Coefficient	ΔBV <sub>DSS</sub> / ΔT <sub>J</sub>	I <sub>D</sub> =250μA Reference 25°C	-	0.7	-	V/°C
Drain to Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =700V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	-	-	1	μA
		V <sub>DS</sub> =560V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	-	-	10	
Gate to Source Forward Leakage	I <sub>GSS(F)</sub>	V <sub>GS</sub> =+30V	-	-	100	nA
Gate to Source Reverse Leakage	I <sub>GSS(R)</sub>	V <sub>GS</sub> =-30V	-	-	-100	nA
<b>ON Characteristics</b>						
Drain-to-Source On-Resistance	R <sub>DSON</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2.1A <sup>(4)</sup>	-	0.54	0.6	Ω
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA <sup>(4)</sup>	3.0	-	4.0	V
<b>Dynamic Characteristics</b>						
Gate resistance	R <sub>g</sub>	f=1.0MHz	-	8.5	-	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz	-	490	-	pF
Output Capacitance	C <sub>oss</sub>		-	530	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	12	-	
<b>Switching Characteristics</b>						
Turn-on Delay Time	t <sub>d(ON)</sub>	I <sub>D</sub> =3A, V <sub>DD</sub> =400V, V <sub>GS</sub> =10V, R <sub>G</sub> =10Ω	-	10	-	ns
Rise Time	t <sub>r</sub>		-	7	-	
Turn-Off Delay Time	t <sub>d(OFF)</sub>		-	41	-	
Fall Time	t <sub>f</sub>		-	28	-	
Total Gate Charge	Q <sub>g</sub>	I <sub>D</sub> =3A, V <sub>DD</sub> =480V, V <sub>GS</sub> =10V	-	16	-	nC
Gate to Source Charge	Q <sub>gs</sub>		-	2.5	-	
Gate to Drain ("Miller") Charge	Q <sub>gd</sub>		-	5.6	-	
<b>Source-Drain Diode Characteristics</b>						
Continuous Source Current (Body Diode)	I <sub>S</sub>	T <sub>c</sub> =25°C	-	-	8	A
Maximum Pulsed Current (Body Diode)	I <sub>SM</sub>		-	-	24	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =3A, V <sub>GS</sub> =0V*	-	-	1.2	V
Reverse Recovery Time	T <sub>rr</sub>	I <sub>S</sub> =3A, T <sub>J</sub> =25°C dIF/dt =100A/μs V <sub>GS</sub> =0V	-	196	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	1568	-	nC
Reverse Recovery Current	I <sub>rrm</sub>		-	16	-	A

\* Pulse width tp≤300μs, δ≤2%



## TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Safe Operating Area (TO-220)

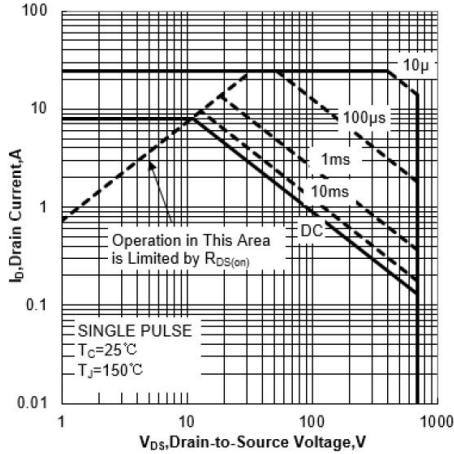


Fig 2. Safe Operating Area (TO-220F)

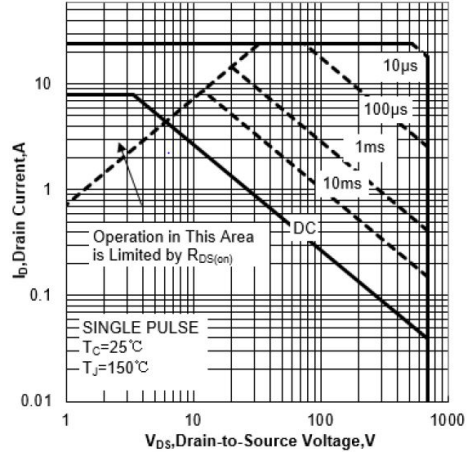


Fig3. Power Dissipation (TO-220)

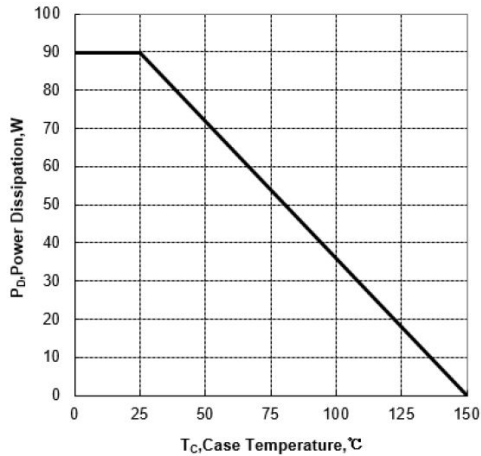


Fig4. Power Dissipation (TO-220F)

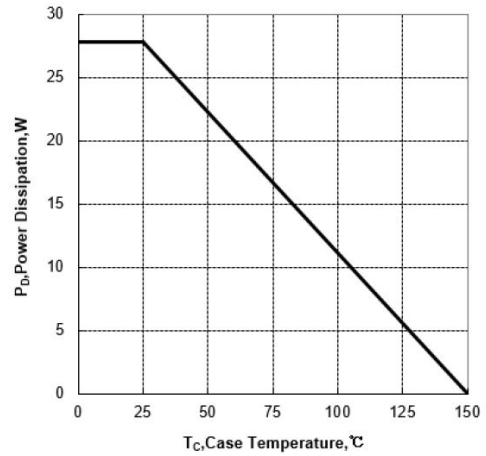


Fig5. Typical Output Characteristics

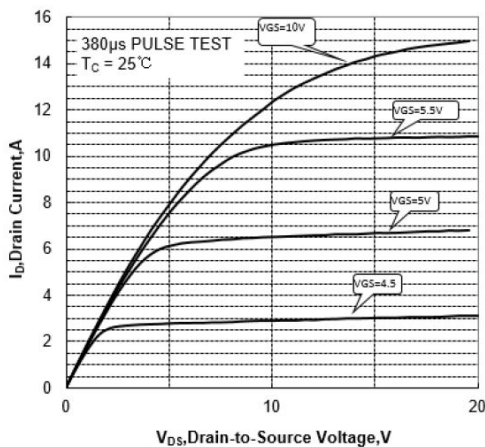


Fig6. Typical Transfer Characteristics

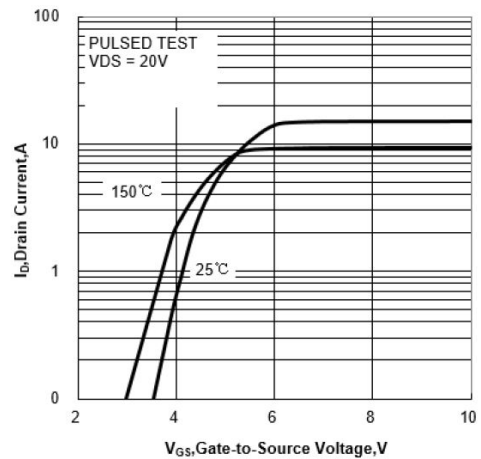




Fig7. Typical Drain to Source ON Resistance vs. Drain Current

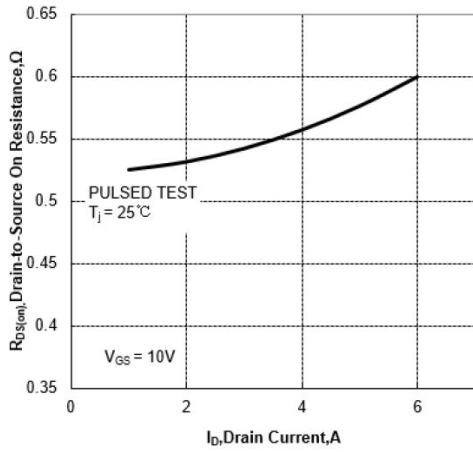


Fig8. Typical Drain to Source on Resistance vs. Junction Temperature

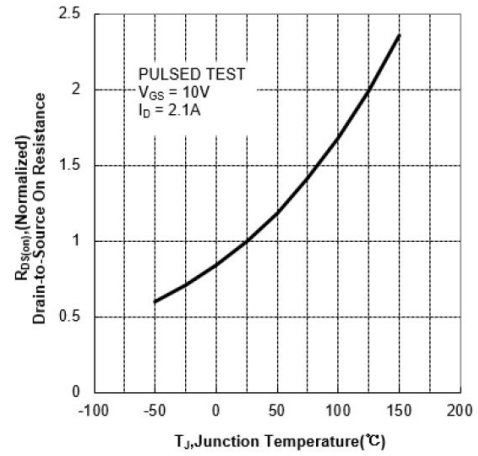


Fig9. Typical Threshold Voltage vs. Junction Temperature

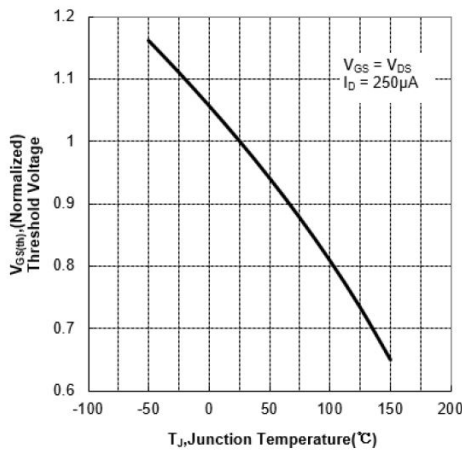


Fig10. Typical Breakdown Voltage vs. Junction Temperature

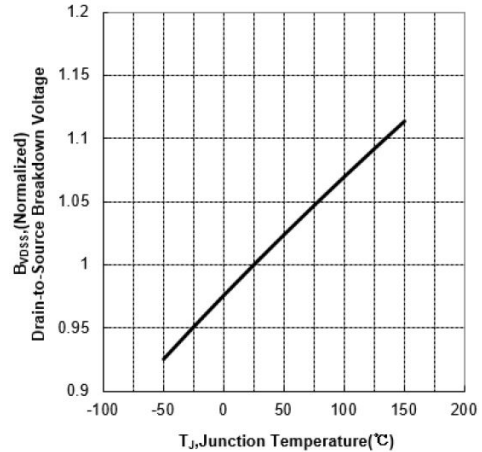


Fig 11. Typical Capacitance vs. Drain to Source Voltage

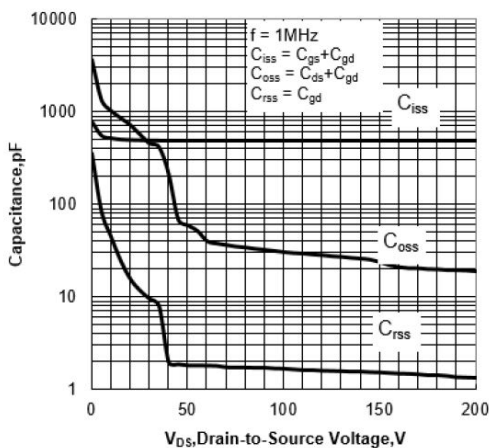
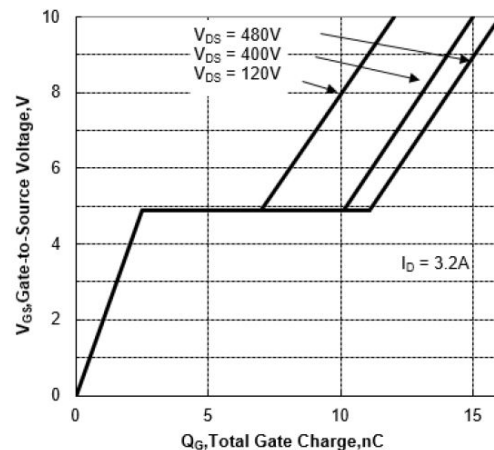


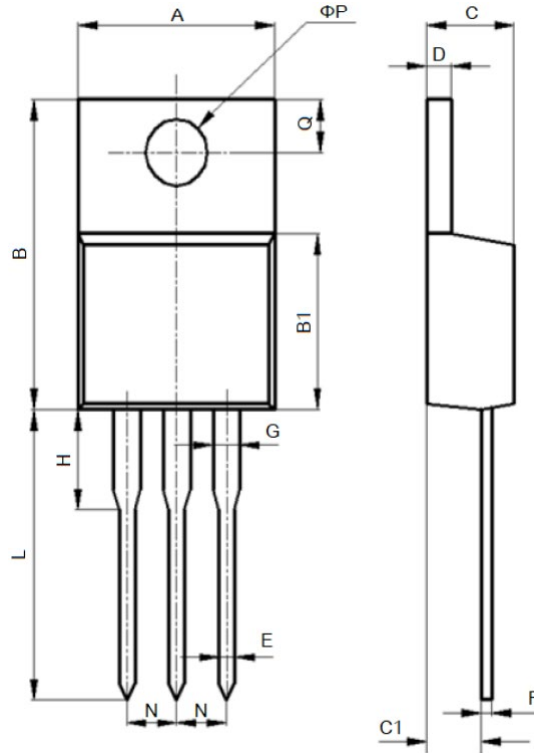
Fig 12. Typical Gate Charge vs. Gate to Source Voltage





## PACKAGE INFORMATION

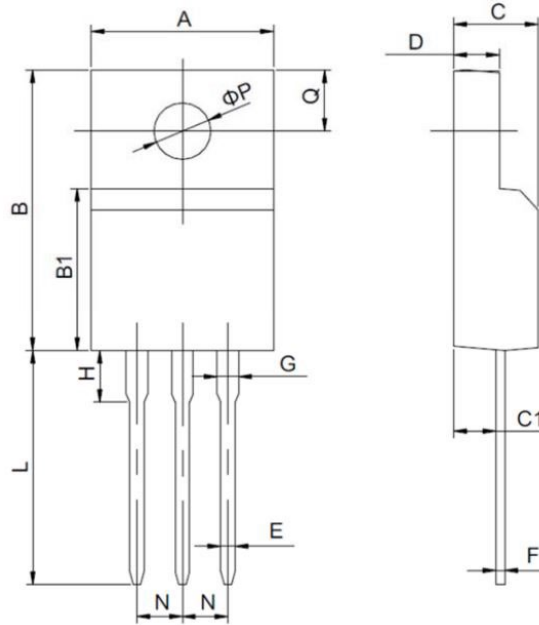
Dimension in TO-220 (Unit: mm)



Symbol	Min.	Max.
A	9.600	10.600
B	15.000	16.000
B1	8.900	9.500
C	4.300	4.800
C1	2.300	3.100
D	1.200	1.400
E	0.700	0.900
F	0.300	0.600
G	1.170	1.370
H	2.700	3.800
L	12.600	14.800
N	2.340	2.740
Q	2.400	3.000
ΦP	3.500	3.900



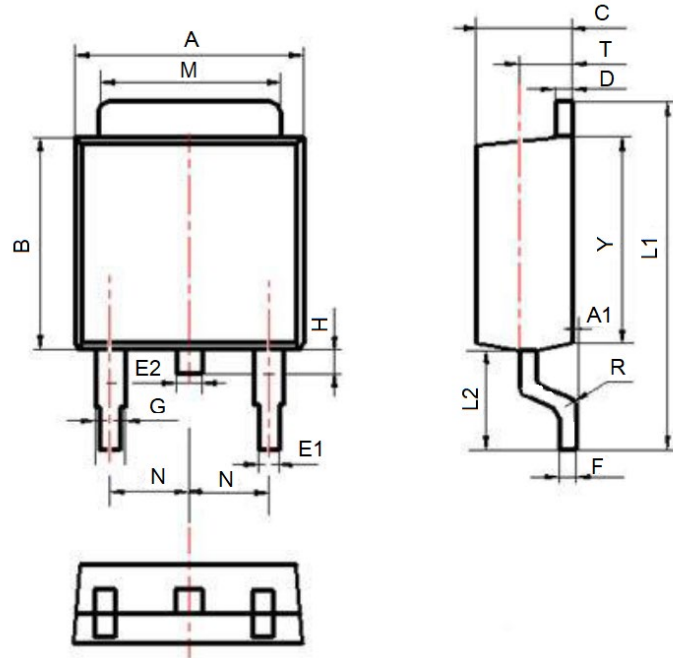
Dimension in TO-220F (Unit: mm)



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



Dimension in TO-252 (Unit: mm)



Symbol	MILLIMETERS	
	Min.	Max.
A	6.300	6.900
A1	0	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
L1	9.600	10.500
L2	2.700	3.100
H	0.600	1.000
M	5.100	5.500
N	2.090	2.490
R	0.300	
T	1.400	1.600
Y	5.100	6.300





## **IMPORTANT NOTICE**

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