



DESCRIPTION

The AM13N50 is available in TO-220, TO-220F Packages.

VDSS	RDSON	ID
	V _{GS} =10V	
500V	0.42Ω	13A

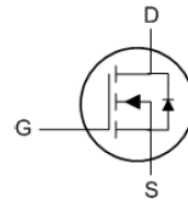
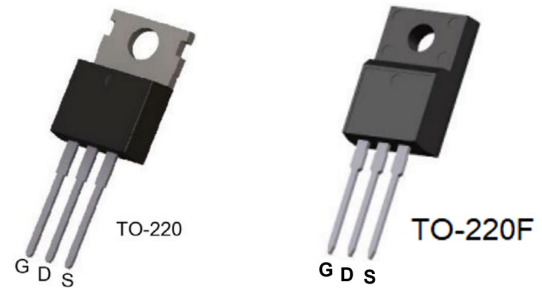
FEATURE

- Fast Switching.
- Low On Resistance
- Low Gate Charge

PIN DESCRIPTION

MECHANICAL DATA

- Case: Molded plastic
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Solder bath temperature 275°C maximum, 10s per JESD 22-106



ORDERING INFORMATION

Package Type	Part Number	
TO-220 SPQ: 50pcs /Tube	T3	AM13N50T3U
		AM13N50T3VU
TO-220F SPQ: 50pcs /Tube	T3F	AM13N50T3FU
		AM13N50T3FVU
Note	U: Tube V: Halogen free Package	
AiT provides all RoHS products		

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

**ABSOLUTE MAXIMUM RATINGS**T_C=25°C, unless otherwise Noted

V _{DS} , Drain-Source Voltage		500V	
V _{GS} , Gate-Source Voltage		±30V	
I _D , Continue Drain Current	T _C =25°C	13A	
	T _C =100°C	8A	
I _{DM} , Pulsed Drain Current ⁽¹⁾		52A	
P _D , Power Dissipation	-	TO-220F	60W
		TO-220	150W
	Derate Above 25°C	TO-220F	0.40W/°C
		TO-220	1.14W/°C
E _{AS} , Single Pulse Avalanche Energy ⁽²⁾		845mJ	
I _{AR} , Avalanche Current ⁽¹⁾		13A	
E _{AS} , Repetitive Avalanche Energy ⁽¹⁾		17mJ	
T _J , Operating Temperature Range		150°C	
T _{STG} , Storage Temperature Range		-55°C~+150°C	
R _{θJC} , thermal resistance, Junction-Case	TO-220F	2.60°C/W	
	TO-220	0.93°C/W	
R _{θJA} , thermal resistance, Junction-Ambient	TO-220F	62.5°C/W	
	TO-220	62.5°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 maximum junction temperature.

(2) IAS = 13 A, VDD = 50 V, L = 10mH, RG = 250, starting T_J = 25°C.



ELECTRICAL CHARACTERISTICS

T_C = 25°C, unless otherwise Noted

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	500	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 500V, V _{GS} =0V	-	-	1	μA
		V _{DS} = 400V, T _C = 125°C	-	-	10	
Gate Leakage Current	I _{GSS}	V _{GS} =±30, V _{DS} =0V	-	-	±100	nA
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =6.5A	-	0.42	0.55	mΩ
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	-	4	V
Forward Transconductance	g _{fs}	V _{DS} =15V, I _D =6.5uA	-	13	-	Ω
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz	-	1560	-	pF
Output Capacitance	C _{oss}		-	160	-	
Reverse Transfer Capacitance	C _{rss}		-	17	-	
Total Gate Charge	Q _g	V _{DD} = 400V, I _D =13A, V _{GS} = 10V ⁽¹⁾⁽²⁾	-	40	-	nC
Gate to Source charge	Q _{gS}		-	8	-	
Gate to Drain charge	Q _{gd}		-	16	-	
Turn-On Delay Time	t _{d(on)}	V _{DD} = 250V, I _D =13A, R _G =10Ω ⁽¹⁾⁽²⁾	-	13	-	ns
Rise Time	t _r		-	16	-	
Turn-Off Delay Time	t _{d(off)}		-	40	-	
Fall Time	t _f		-	17	-	
Maximum Continuous Drain-Source Diode Forward Current	I _S	-	-	-	13	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}	-	-	-	52	
Diode-Source Diode Forward Voltage	V _{SD}	I _{SD} =13A	-	-	1.40	V
Reverse Recovery Time	T _{rr}	I _{SD} =13A, V _{GS} = 0V,	-	262	-	ns
Reverse Recovery Charge	Q _{rr}	diF/dt=100A/us	-	1.70	-	nC
Pulse width tp≤300μs, δ≤2%						



TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Safe Operating Area

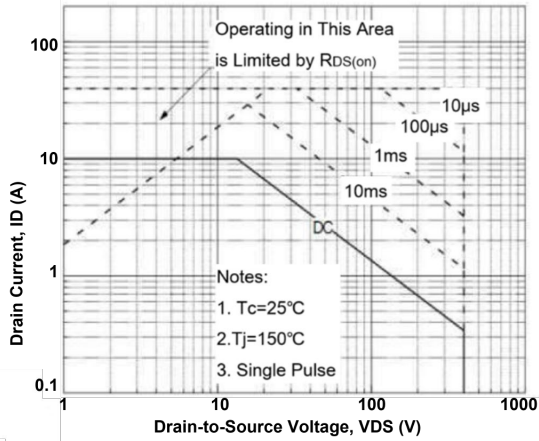


Fig 2. Power Dissipation

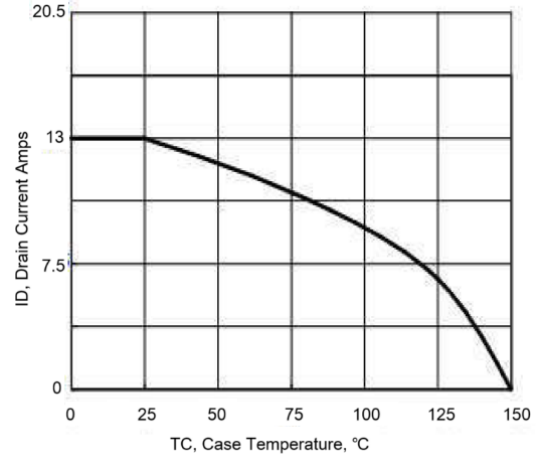


Fig 3. Typical Output Characteristics

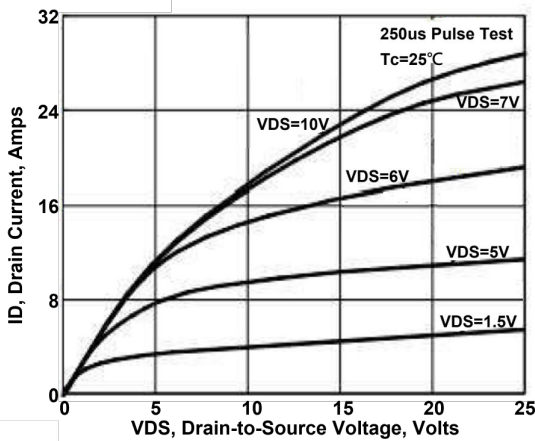


Fig 4. Typical Capacitance vs. Drain to Source Voltage

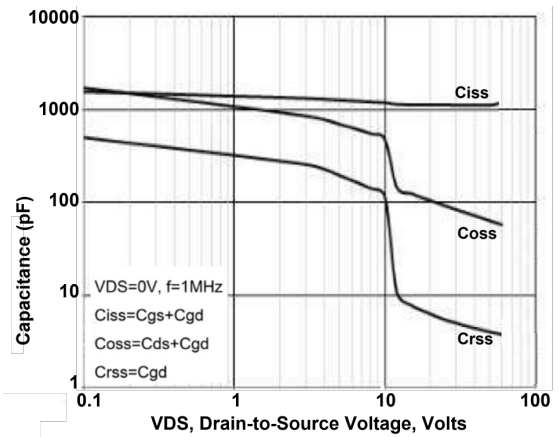


Fig 5. Typical Drain to Source ON Resistance vs. Drain Current

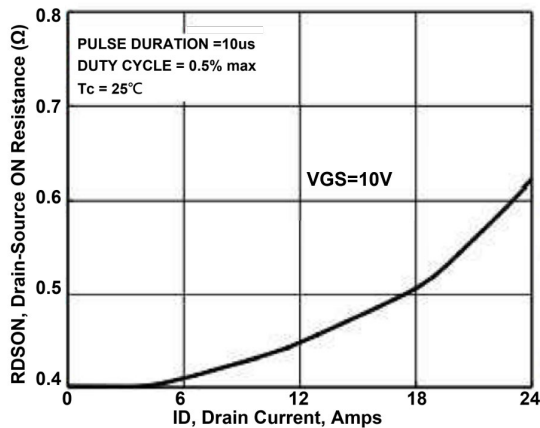




Fig 6. Reverse Drain Current vs. Source to Drain Voltage

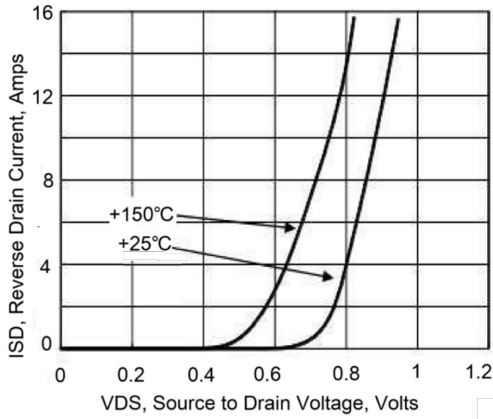


Fig 7. Typical Breakdown Voltage vs. Junction Temperature

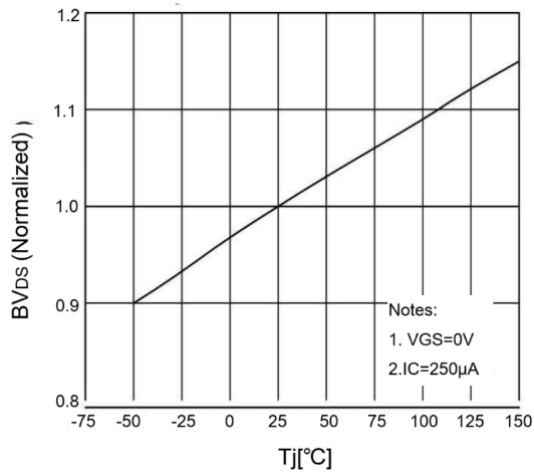
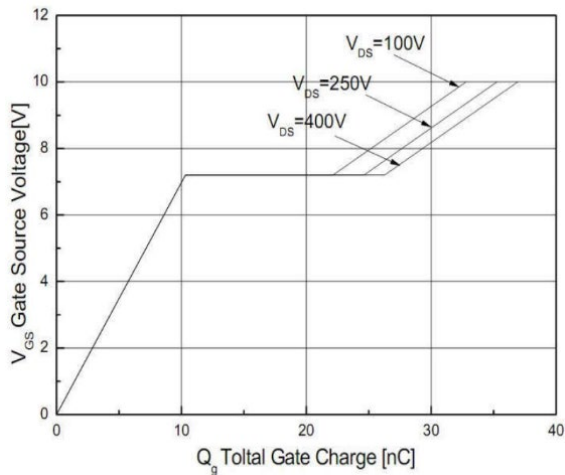


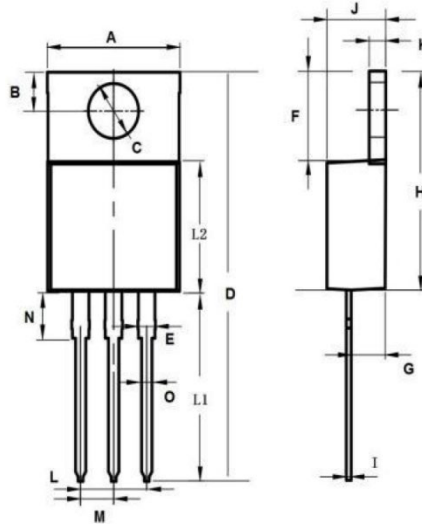
Fig 8. Typical Gate Charge vs. Gate to Source Voltage





PACKAGE INFORMATION

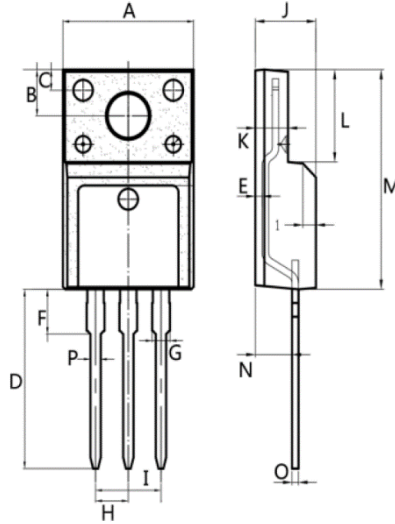
Dimension in TO-220 (Unit: mm)



Symbol	Millimeter	
	Min.	Max.
A	10.150	10.350
B	2.500	2.950
C	3.700	3.900
D	28.500	29.500
E	1.200	1.400
F	6.200	6.550
G	2.850	3.250
H	15.000	16.000
I	0.350	0.420
J	4.300	4.550
K	1.200	1.400
L	5.080 TYP.	
L1	13.000	14.000
L2	8.500	9.500
M	2.540 TYP.	
N	2.800	3.500
O	0.700	0.900



Dimension in TO-220F (Unit: mm)



Symbol	Millimeter	
	Min.	Max.
A	9.950	10.350
B	2.950	3.250
C	1.250	1.450
D	12.650	12.950
E	0.400	0.600
F	2.800	3.500
G	1.300	1.450
H	2.540 TYP.	
I	5.080 TYP.	
J	4.600	4.750
K	2.450	2.650
L	6.450	6.850
M	15.400	16.000
N	2.750	3.050
O	0.450	0.550
P	0.700	0.900



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