

**DESCRIPTION**

The AM65R330TF is available in TO-220F Packages.

BVDSS	RDSON	ID
650V	330mΩ	11A

APPLICATION

- SMPS
- Power Supply
- General Purpose Applications

ORDERING INFORMATION

Package Type	Part Number	
TO-220F	TF	AM65R330TF
Note	SPQ: 50pcs/Tube	
AiT provides all RoHS products		

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	BV _{DSS}	650	V
Continuous Drain Current	I _D	11	A
Continuous Drain Current T _A = 100 °C		6.93	A
Pulsed Drain Current ⁽¹⁾	I _{DM}	33	A
Gate-to-Source Voltage	V _{GS}	±30	V
Single Pulse Avalanche Energy ⁽²⁾	E _{AS}	250	mJ
Peak Diode Recovery dv/dt ⁽³⁾	dv/dt	15	V/ns
Power Dissipation	P _D	100	W
Derating Factor above 25°C		0.8	W/°C
Operating Junction and Storage Temperature Range	T _J , T _{stg}	150 , -55 to 150	°C
Maximum Temperature for Soldering	T _L	300	°C

THERMAL RESISTANCE

Junction-to-Case	R _{θJC}	1.25	°C/W
Junction-to-Ambient	R _{θJA}	62.5	

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=20mH, V_{DS}=50V, Start T_A=25°C

(3) I_{SD} = 4.8A, di/dt ≤ 100A/us, V_{DD} ≤ BV_{DSS}, Start T_A=25°C

FEATURE

- Advanced Super Junction Technology
- Fast Switching
- R_{DS(ON)typ.} = 330mΩ @ V_{GS} = 10V
- Excellent dv/dt effect decline

PIN DESCRIPTION

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

**ELECTRICAL CHARACTERISTICS** $T_A = 25^\circ\text{C}$, unless otherwise specified.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain to Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	650			V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} / ΔT _J	I _D =250uA, Reference25°C		0.7		V/°C
Drain to Source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} = 0V, T _j = 25°C			1	μA
		V _{DS} =520V, V _{GS} = 0V, T _j = 125°C			100	μA
Gate to Source Forward Leakage	I _{GSS} (F)	V _{GS} =+30V			100	nA
Gate to Source Reverse Leakage	I _{GSS} (R)	V _{GS} =-30V			-100	nA
ON CHARACTERISTICS						
Drain-to-Source On-Resistance	R _{DS} (ON)	V _{GS} =10V, I _D =3.8A ⁽⁴⁾		0.33	0.38	Ω
Gate Threshold Voltage	V _{GS} (TH)	V _{DS} = V _{GS} , I _D = 250μA ⁽⁴⁾	2.0		4.0	V
Dynamic CHARACTERISTICS						
Gate resistance	R _g	f = 1.0MHz		10		Ω
Input Capacitance	C _{iss}	V _{GS} = 0V		770		PF
Output Capacitance	C _{oss}	V _{DS} = 25V		560		
Reverse Transfer Capacitance	C _{rss}	f = 1.0MHz		25		
Switching CHARACTERISTICS						
Turn-on Delay Time	t _d (ON)	ID =4.8A V _{DD} = 400V V _{GS} = 10V R _G =5Ω		11		ns
Rise Time	t _r			9		
Turn-Off Delay Time	t _d (OFF)			38		
Fall Time	t _f			8		
Total Gate Charge	Q _g	I _D =4.8A V _{DD} =520V V _{GS} = 10V		21.8		nC
Gate to Source Charge	Q _{gs}			4.5		
Gate to Drain (“Miller”) Charge	Q _{gd}			8		
Source-Drain Diode CHARACTERISTICS						
Continuous Source Current (Body Diode)	I _s	T _A =25 °C			11	A
Maximum Pulsed Current (Body Diode)	I _{SM}				33	A
Diode Forward Voltage	V _{SD}	I _S =4.8A, V _{GS} =0V ⁽⁴⁾			0.9	V
Reverse Recovery Time	T _{rr}	I _S =4.8A, T _j = 25°C		285		ns
Reverse Recovery Charge	Q _{rr}	dIF/dt=100A/us,		3135		nC
Reverse Recovery Current	I _{rrm}	V _{GS} =0V		22		A

(4) Pulse width $t_p \leq 300\mu s$, $\delta \leq 2\%$



TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Safe Operating Area

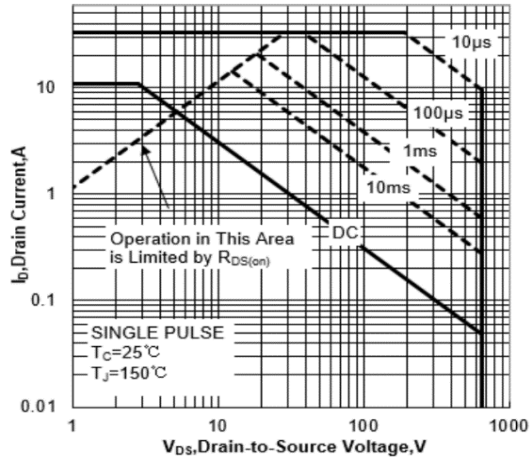


Fig 2. Power Dissipation

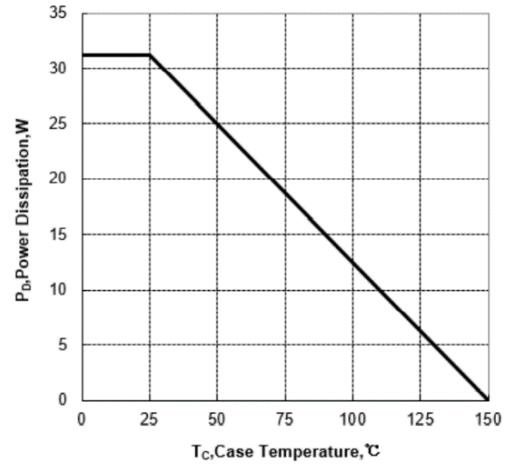


Fig 3. Max Thermal Impedence

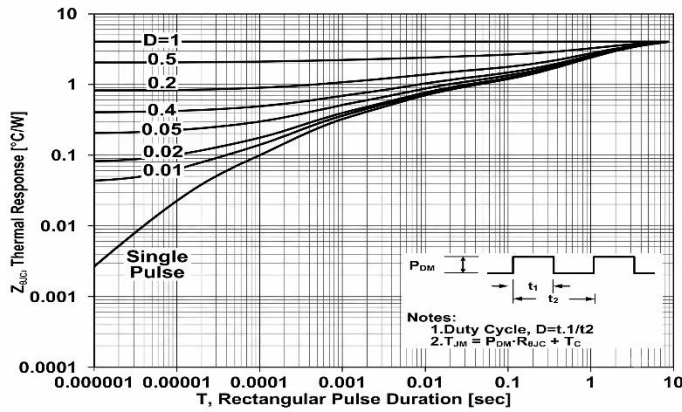


Fig 4. Typical Output Characteristics

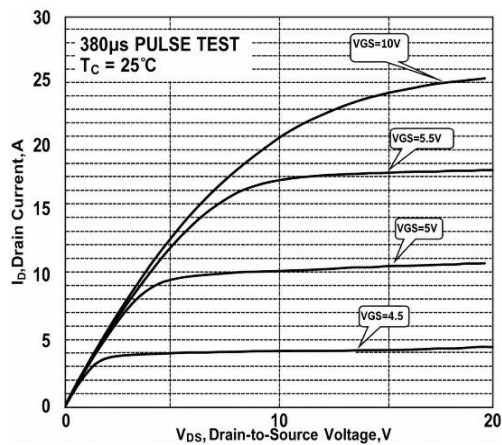


Fig 5. Typical Transfer Characteristics

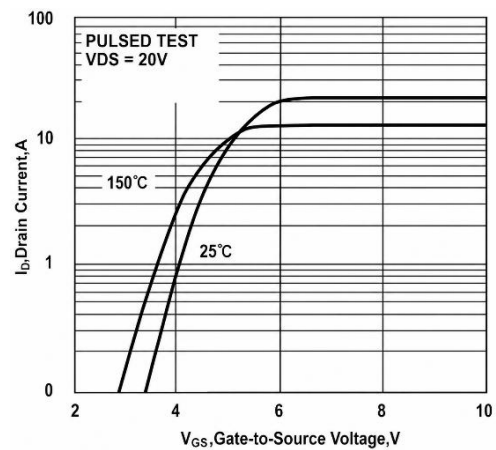




Fig 6. Typical Drain to Source ON Resistance vs Drain Current

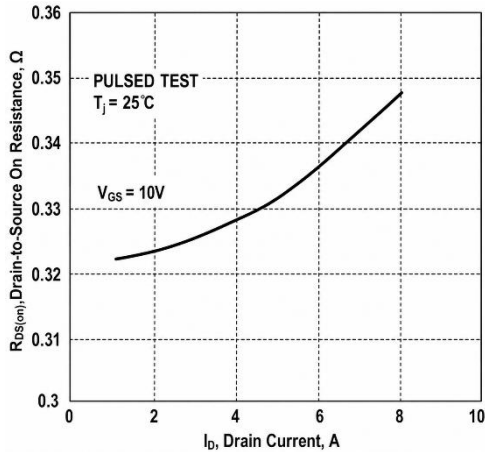


Fig 7. Typical Drain to Source on Resistance vs Junction Temperature

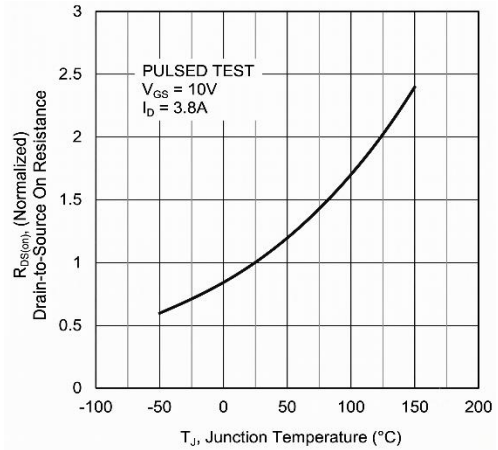


Fig 8. Typical Threshold Voltage vs Junction Temperature

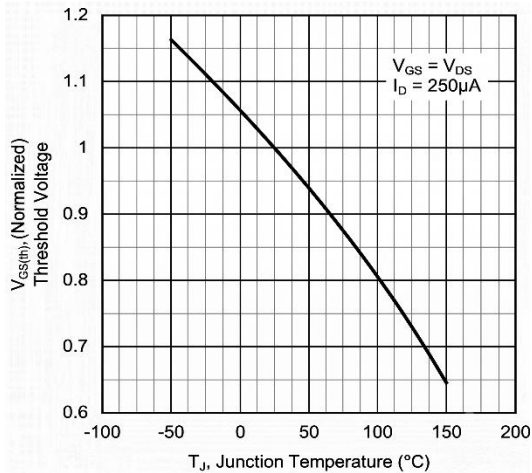


Fig 9. Typical Breakdown Voltage vs Junction Temperature

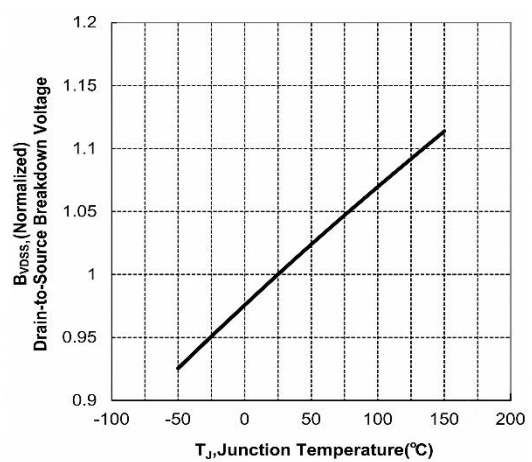


Fig 10. Typical Capacitance vs Drain to Source Voltage

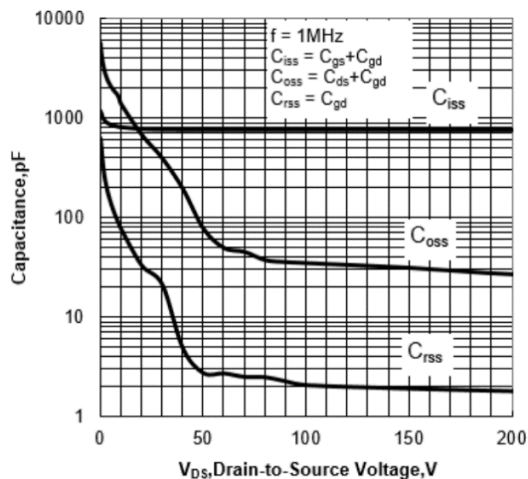
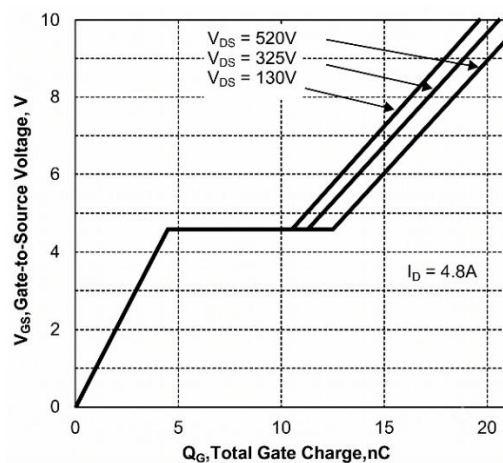


Fig 11. Typical Gate Charge vs Gate to Source Voltage





Test Circuit & Waveform

Fig 12. Gate Charge Test Circuit & Waveform

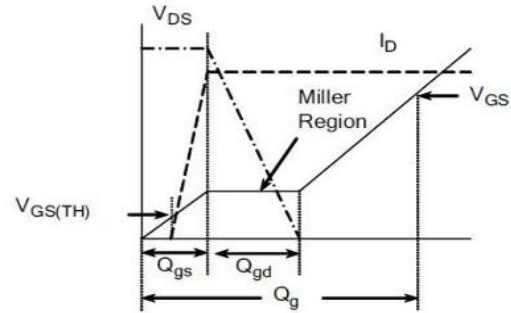
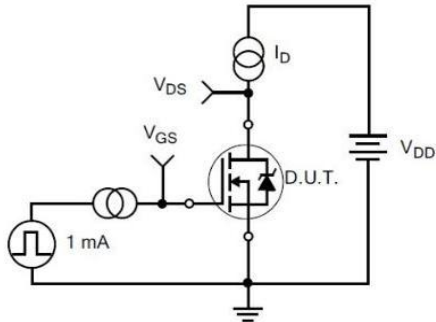


Fig 13. Resistive Switching Test Circuit & Waveform

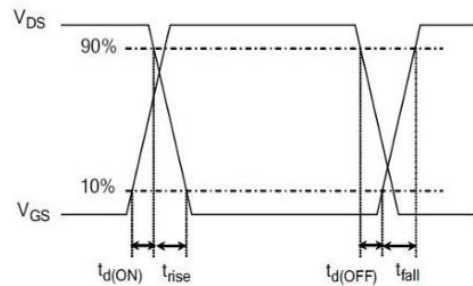
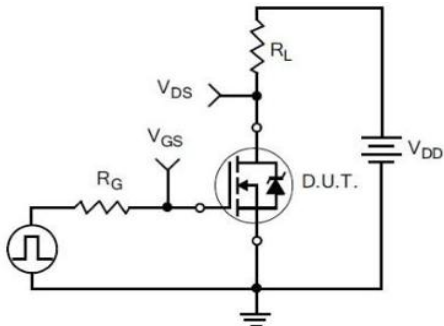


Fig 14. Diode Reverse Recovery Test Circuit & Waveform

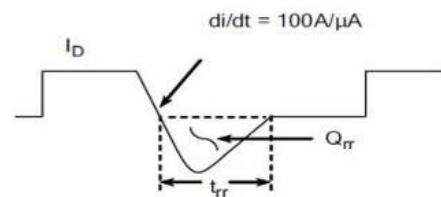
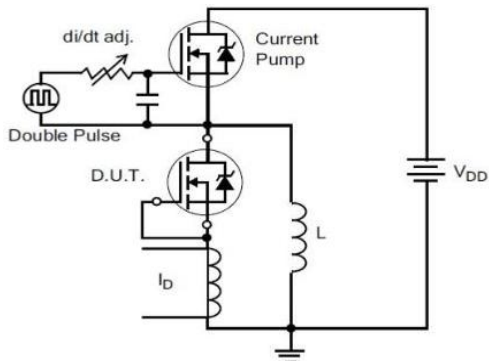
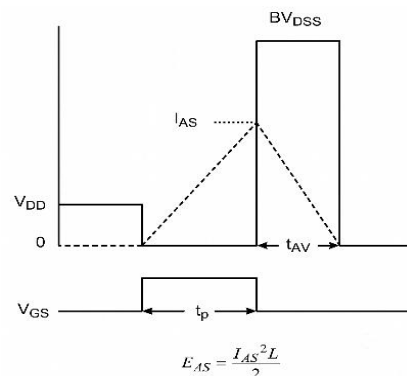
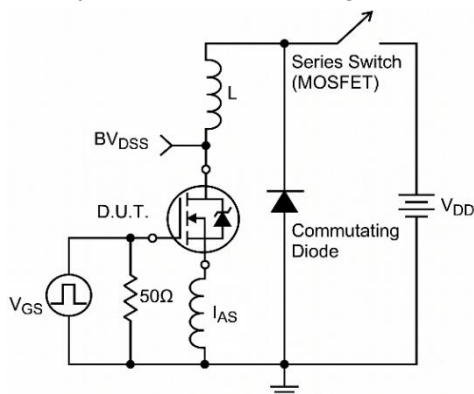


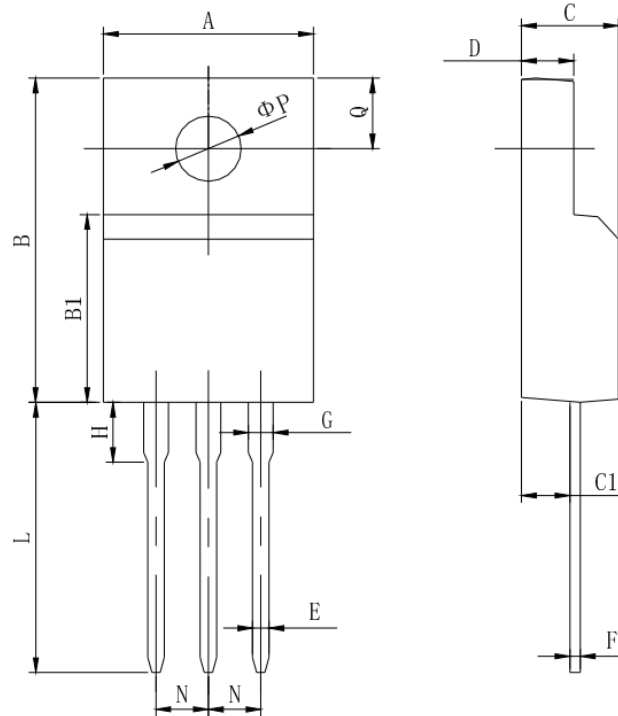
Fig 15. Unclamped Inductive Switching Test Circuit & Waveforms





PACKAGE INFORMATION

Dimension in TO-220F (Unit: mm)



Symbol	Min.	Max.
A	9.60	10.4
B	15.4	16.2
B1	8.90	9.50
C	4.30	4.90
C1	2.10	3.00
D	2.40	3.00
E	0.60	1.00
F	0.30	0.60
G	1.12	1.42
H	3.40	3.80
	1.60	2.90
L	12.0	14.0
N	2.34	2.74
Q	3.15	3.55
ΦP	2.90	3.30



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