DESCRIPTION

The AM40T65 is available in TO-3PN package.

V_{CES}	I_C	V_{CE}	P_D
650V	40A	1.55V	333W

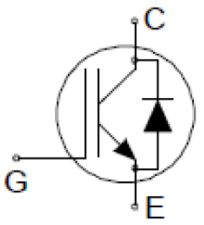
FEATURE

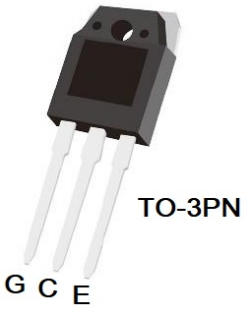
- Fast Switching
- Positive temperature coefficient
- Fast recovery anti-parallel diode

APPLICATION

- Welding converters
- UPS
- Air condition

PIN DESCRIPTION





Pin#	Symbol	Function
1	G	Gate
2	C	Collector
3	E	Emitter

ORDERING INFORMATION

Package Type	Part Number	
TO-3PN SPQ: 30pcs/Tube	TX	AM40T65TXU
		AM40T65TXVU
Note	U: Tube V: Halogen free Package	
AiT provides all RoHS products		

ABSOLUTE MAXIMUM RATINGS

T_C = 25℃, unless otherwise noted

V_{CES}, Collector-Emitter Voltage		650V
I_C, Collector Current	T_C=25℃	80A
	T_C=100℃	40A
I_{CM}, Pulsed Collector Current (1)	T_C=25°C	120A
I_F, Diode Continuous Forward Current	T_C=25℃	40A
	T_C=100℃	20A
I_{FM}, Diode Maximum Forward Current	T_C=25°C	80A
V_{GES}, Gate-Emitter Voltage		±30V
P_D, Power Dissipation	T_C=25°C	333W
T_{JMAX}, Operating Junction Temperature Range		+150℃
T_{STG}, Storage Temperature Range		-55℃~+175℃
T_L, Maximum Temperature for Soldering		270℃

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

*Pulse width limited by maximum junction temperature

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ.	Max	Units
Junction-to-Case (IGBT)	$R_{\theta JC}$	-	0.45	℃/W
Junction-to-Case (Diode)	$R_{\theta JC}$	-	1.12	
Junction-to-Ambient	$R_{\theta JA}$	-	40	

ELECTRICAL CHARACTERISTICS

T_C = 25°C, unless otherwise stated.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF Characteristics						
Collector-Emitter Breakdown Voltage	V_{CES}	V_{GE}=0V, I_C=-250μA	650	-	-	V
Collector-Emitter Leakage Current	I_{CES}	V_{CE}= 650V, V_{GE}=0V	-	-	4	μA
Gate-Emitter Leakage Current	$I_{GES(F)}$	V_{GE}=+30V	-	-	200	nA
Gate-Emitter Reverse Leakage	$I_{GES(R)}$	V_{GE}=-30V	-	-	-200	
ON Characteristics						
Collector-Emitter Saturation Voltage	$V_{CE\ (sat)}$	V_{GE}=15V, I_C=40A	-	1.55	1.9	V
Gate Threshold Voltage	$V_{GE(TH)}$	V_{CE}=V_{GE}, I_C=1mA	4.8	5.5	6.2	
Pulse width tp≤300μs, δ≤2%						
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{CE}=25V, V_{GE}=0V, f=1.0MHz	-	2170	-	pF
Output Capacitance	C_{oss}		-	94	-	
Reverse Transfer Capacitance	C_{rss}		-	27	-	
Total Gate Charge	Qg	I_C=40A, V_{CE}=520V, V_{GE}=15V	-	105	-	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d\ (on)}$	I_C=40A, V_{CE}=400V, V_{GE}=15V, R_G=10Ω, T_J=25℃, Inductive Load	-	30	-	ns
Rise Time	t_r		-	65	-	
Turn-Off Delay Time	$t_{d\ (off)}$		-	165	-	
Fall Time	t_f		-	23	-	
Turn-On Switching Loss	E_{on}		-	1.24	-	mJ
Turn-Off Switching Loss	E_{off}		-	0.75	-	
Total Switching Loss	E_{ts}		-	1.99	-	
Diode Characteristics						
Diode Forward Voltage	V_F	I_F=20A	-	1.95	2.4	V
Reverse Recovery Time	T_{rr}	I_F=20A, di/dt=200A/us, T_J=25℃	-	112	-	ns
Reverse Recovery Charge	Q_{rr}		-	650	-	nC
Reverse Recovery Current	I_{rrm}		-	10.0	-	A

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Forward Bias Safe Operating Area

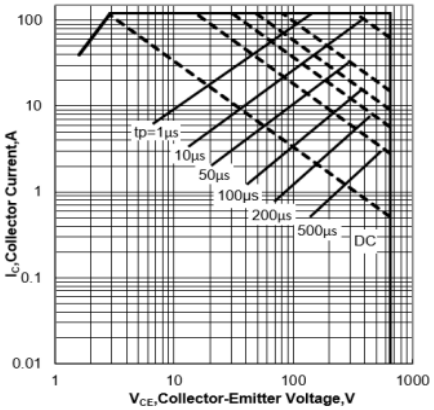


Fig 2. Power Dissipation vs. Case Temperature

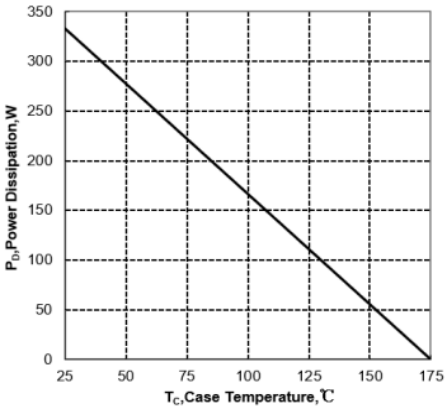


Fig3. Collector Current vs. Case Temperature

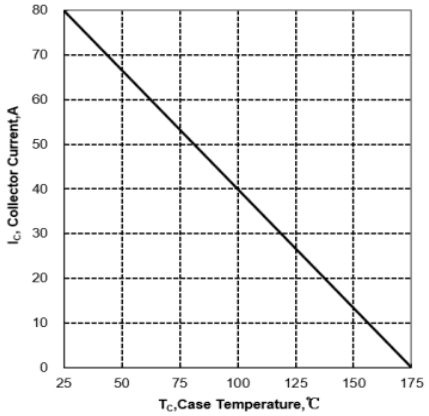


Fig4. Typical Transfer Characteristics

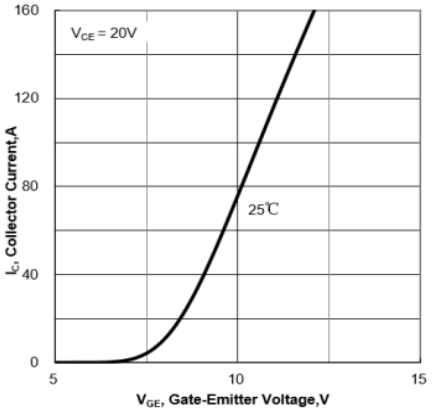


Fig5. Typical Output Characteristics(T_C=25℃)

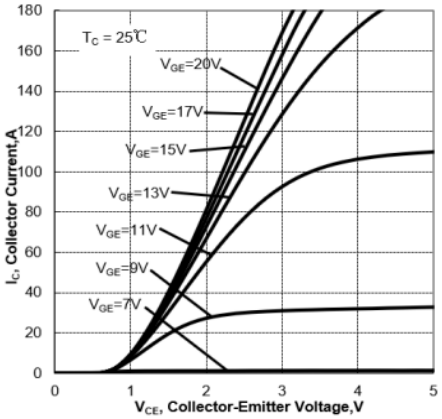


Fig6. Typical Gate Charge

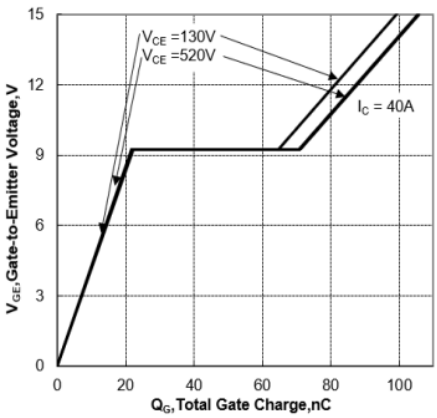


Fig7. Typical Capacitance vs. Collector-Emitter Voltage

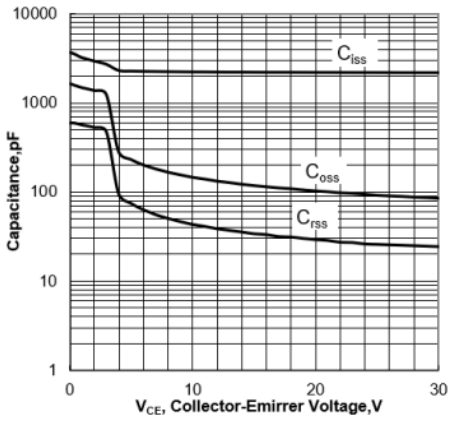


Fig8. IGBT Transient Thermal Impedance vs. Pulse Width

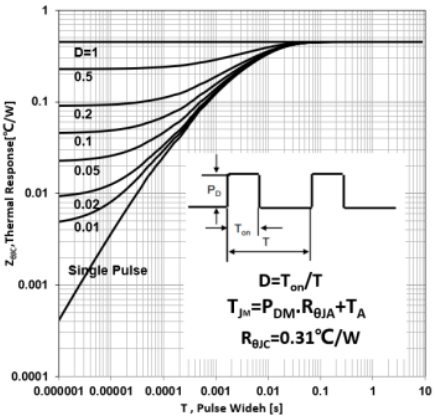


Fig9. Diode Transient Thermal Impedance vs. Pulse Width

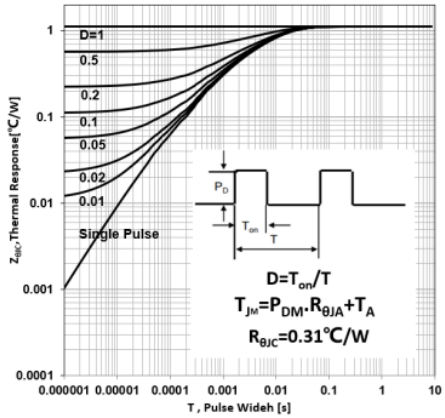


Fig10. Typical Diode Forward Current vs. Forward Voltage

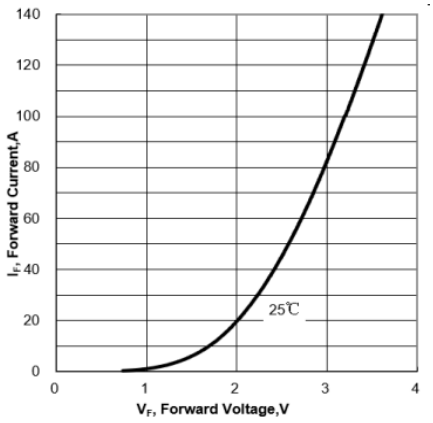


Fig11. Inductive Switching Test Circuit

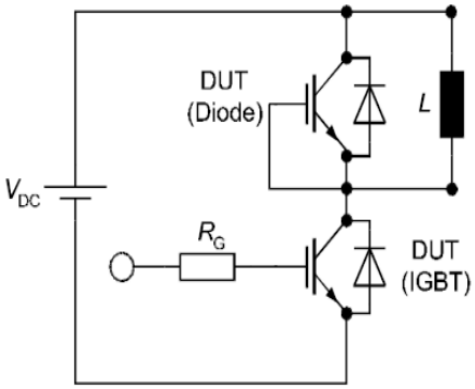


Fig12. Definition of Switching Times

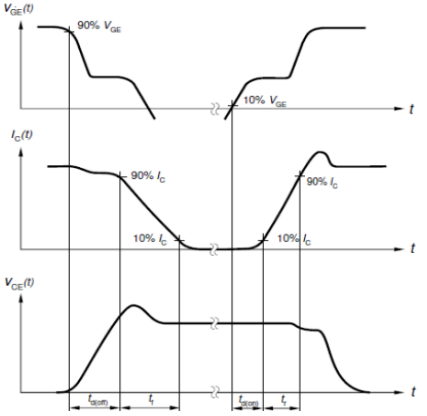


Fig13. Definition of Switching Losses

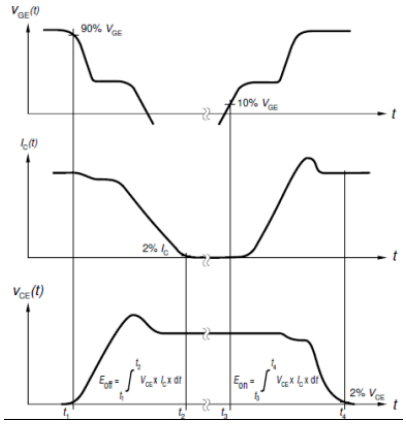
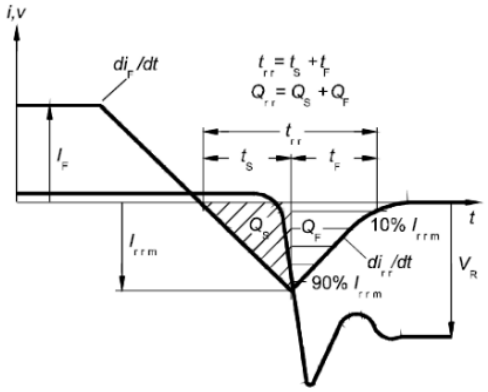
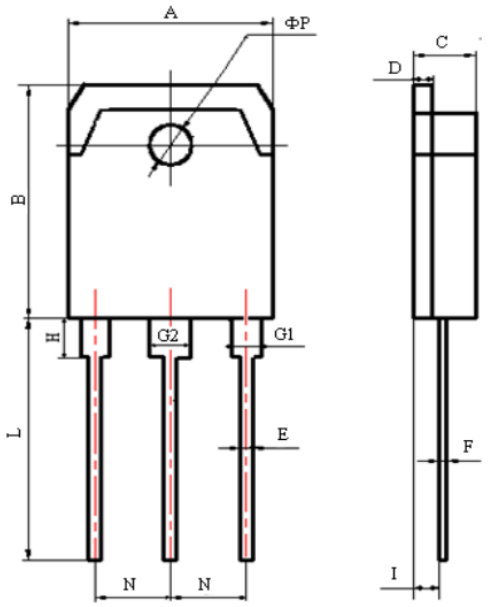


Fig14. Definition of Diode Switching Characteristics



PACKAGE INFORMATION

Dimension in TO-3PN (Unit: mm)



Symbol	Min.	Max.
A	15.000	16.000
B	19.200	20.600
C	4.600	5.000
D	1.400	1.600
E	0.900	1.100
F	0.500	0.700
G1	2.000	2.200
G2	3.000	3.200
H	3.000	3.700
I	1.200	2.900
L	19.000	21.000
N	5.250	5.650
ΦP	3.100	3.300

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