

**DESCRIPTION**

The AM50T65 is available in TO-247 Package.

V _{CES}	I _C	V _{CE}	P _D
650V	50A	1.58V	275W

APPLICATIONS

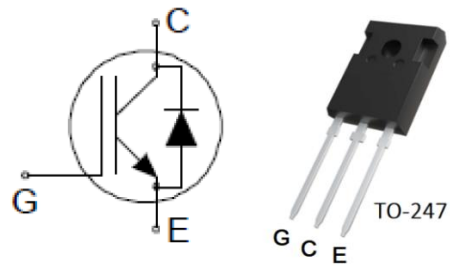
- Charging Pile
- OBC
- UPS
- Inverter

ORDERING INFORMATION

Package Type	Part Number	
TO-247 SPQ: 25pcs/Tube 600pcs/Box	TL3F	AM50T65TL3FU
Note	U: Tube V: Halogen free Package	
AiT provides all RoHS products		

FEATURE

- 650V grooved gate/field termination process
- Low switching loss
- Positive temperature coefficient.

PIN DESCRIPTION

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

ABSOLUTE MAXIMUM RATINGS**IGBT**

Parameter		Symbol	Value	Unit
Collector-Emitter Voltage	T _{vj} =25°C	V _{CES}	650	V
Continuous DC Collector Current	T _C =100°C T _{vj max} =175°C	I _{CNOM}	50	A
Repetitive Peak Collector Current	t _P =1 ms	I _{CRM}	100	A
Gate Charge	V _{GE} =-15V~+15V	QG	0.50	μC
Total Power Dissipation	T _C =25°C T _{vj max} =175°C	P _{TOT}	275	W
Gate Emitter Voltage		V _{GE}	±20	V

Diode

Parameter		Symbol	Value	Unit
Repetitive Peak Reverse Voltage	T _{vj} =25°C	V _R RM	650	V
Continuous DC Forward Current	T _C =100°C T _{vj max} =175°C	I _F	50	A
Repetitive Peak Forward Current	t _P =1 ms	I _{FRM}	100	A

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.



ELECTRICAL CHARACTERISTICS

IGBT

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
Collector-Emitter Saturation Voltage	V _{CEsat}	V _{GE} =15V, I _C =50A, T _{vj} =25°C		-	1.58	2.10	V
		V _{GE} =15V, I _C =50A, T _{vj} =125°C		-	1.87	-	
		V _{GE} =15V, I _C =50A, T _{vj} =150°C		-	1.95	-	
Gate-Emitter Threshold Voltage	V _{GE(TH)}	V _{GE} = V _{CE} , I _C =0.50mA, T _{vj} =25°C		4.2	5.0	5.8	V
Transconductance	G _{FS}	V _{CE} =20V, I _C =50A		-	77	-	S
Input Capacitance	C _{IES}	f=1 MHz, V _{CE} =25V, V _{GE} =0V, T _{vj} =25°C		-	5.46	-	nF
Reverse Transfer Capacitance	C _{RES}			-	0.10	-	
Collector-Emitter Cut-Off Current	I _{CES}	V _{CE} =650V, V _{GE} =0V, T _{vj} =25°C		-	-	1	mA
Gate-Emitter Leakage Current	I _{GES}	V _{CE} =0V, V _{GE} =20V, T _{vj} =25°C		-	-	200	nA
Turn-on Delay Time	t _{d(on)}	I _C =50A, V _{CE} =400V V _{GE} =±15V, R _G =8Ω (Inductive load)	T _{vj} =25°C	-	33	-	ns
			T _{vj} =125°C	-	21	-	
			T _{vj} =150°C	-	19	-	
Rise Time	t _r	I _C =75A, V _{CE} =400V V _{GE} =±15V, R _G =8Ω (Inductive load)	T _{vj} =25°C	-	75	-	ns
			T _{vj} =125°C	-	67	-	
			T _{vj} =150°C	-	65	-	
Turn-off Delay Time	t _{d(off)}	I _C =75A, V _{CE} =400V V _{GE} =±15V, R _G =8Ω (Inductive load)	T _{vj} =25°C	-	32	-	
			T _{vj} =125°C	-	32	-	
			T _{vj} =150°C	-	38	-	
Fall Time	t _f	I _C =75A, V _{CE} =400V V _{GE} =±15V, R _G =8Ω (Inductive load)	T _{vj} =25°C	-	41	-	
			T _{vj} =125°C	-	62	-	
			T _{vj} =150°C	-	62	-	
Turn-On Energy Loss Per Pulse	E _{ON}	I _C =75A, V _{CE} =400V V _{GE} =±15V, R _G =8Ω (Inductive load)	T _{vj} =25°C	-	2.37	-	mJ
			T _{vj} =125°C	-	2.88	-	
			T _{vj} =150°C	-	3.10	-	
Turn-Off Energy Loss Per Pulse	E _{OFF}	I _C =75A, V _{CE} =400V V _{GE} =±15V, R _G =8Ω (Inductive load)	T _{vj} =25°C	-	0.60	-	
			T _{vj} =125°C	-	0.73	-	
			T _{vj} =150°C	-	0.76	-	
IGBT Thermal Resistance, Junction	R _{thJC}			-	0.38	-	K/W
Temperature Under Switching Conditions	R _{vjop}			-40	-	175	°C



Diode

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
Forward Voltage	V _F	I _F =50A, V _{GE} =0V, T _{vj} =25°C		-	1.63	2.10	V
		I _F =50A, V _{GE} =0V, T _{vj} =125°C		-	1.42	-	
		I _F =50A, V _{GE} =0V, T _{vj} =150°C		-	1.37	-	
Peak Reverse Recovery Current	I _{RM}	I _F =50A,	T _{vj} =25°C	-	21	-	A
		-di _F /dt=411A/μs(T _{vj} =150°C)	T _{vj} =125°C	-	29	-	
		V _R =400V, V _{GE} =-15V	T _{vj} =150°C	-	32	-	
Reverse Recovered Charge	Q _{rr}	I _F =50A,	T _{vj} =25°C	-	1.48	-	μC
		-di _F /dt=411A/μs(T _{vj} =150°C)	T _{vj} =125°C	-	3.26	-	
		V _R =400V, V _{GE} =-15V	T _{vj} =150°C	-	3.95	-	
Reverse Recovery Time	t _{rr}	I _F =50A,	T _{vj} =25°C	-	133	-	ns
		-di _F /dt=411A/μs(T _{vj} =150°C)	T _{vj} =125°C	-	199	-	
		V _R =400V, V _{GE} =-15V	T _{vj} =150°C	-	218	-	
Reverse Recovered Energy	E _{rec}	I _F =50A,	T _{vj} =25°C	-	0.34	-	mJ
		-di _F /dt=411A/μs(T _{vj} =150°C)	T _{vj} =125°C	-	0.66	-	
		V _R =400V, V _{GE} =-15V	T _{vj} =150°C	-	0.78	-	
Diode Thermal Resistance Junction	R _{thJC}			-	0.45	-	K/W
Temperature Under Switching Conditions	R _{vjop}			-40	-	175	°C



TYPICAL PERFORMANCE CHARACTERISTICS

Fig.1 Typical output characteristics ($V_{GE}=15V$)

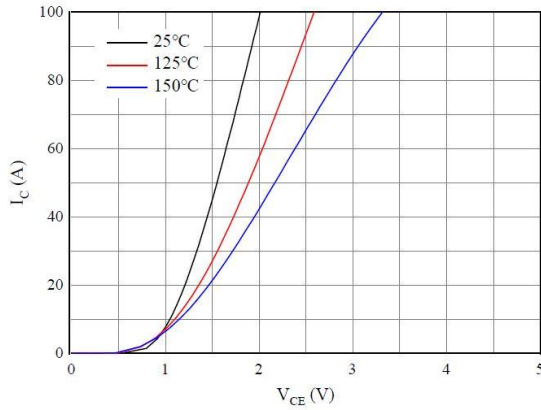


Fig.2 Typical output characteristics ($T_{vj}=150^\circ C$)

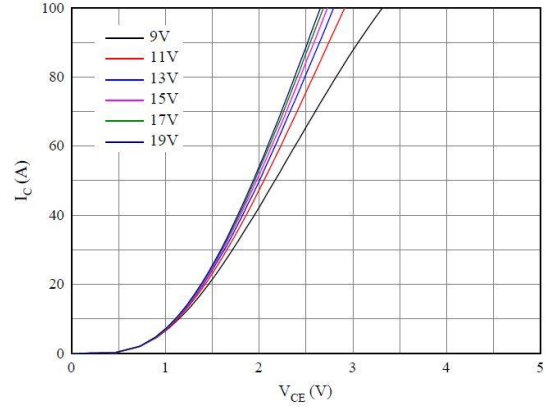


Fig.3 Typical transfer characteristic ($V_{CE}=20V$)

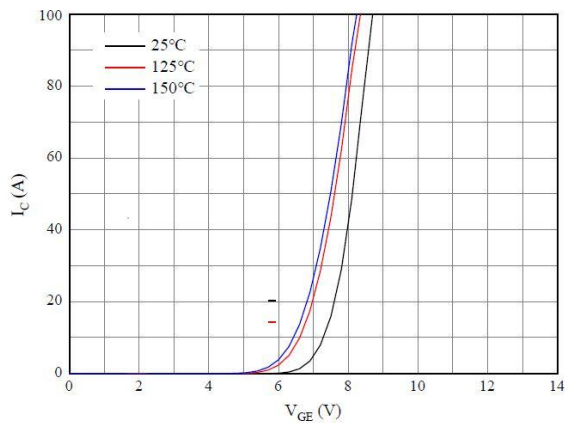


Fig.4 Forward characteristic of Diode

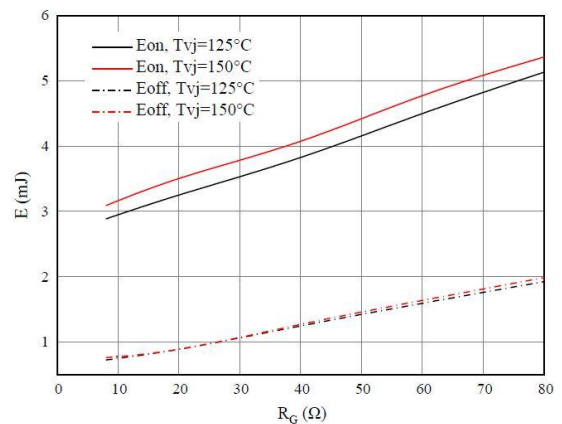


Fig.5 Switching losses of IGBT

$V_{GE}=\pm 15V$, $R_{Gon}=8\Omega$, $R_{Goff}=8\Omega$, $V_{CE}=400V$

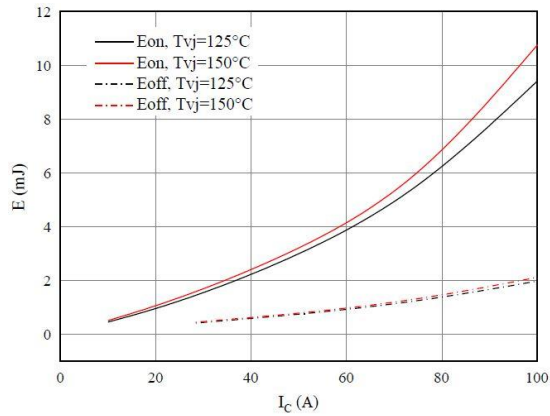


Fig.6 Switching losses of IGBT

$V_{GE}=\pm 15V$, $I_C=50A$, $V_{CE}=400V$

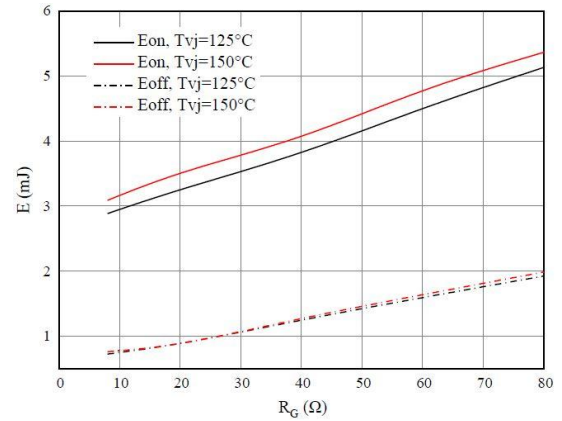




Fig.7 Switching losses of Diode
 $R_{Gon}=8\Omega$, $V_{CE}=400V$

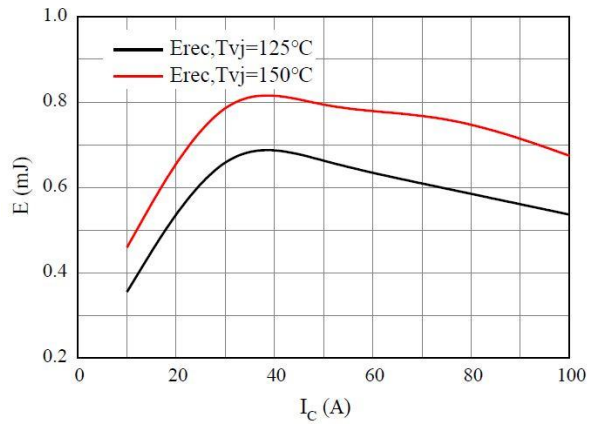


Fig.8 Switching losses of Diode
 $I_F=50A$, $V_{CE}=400V$

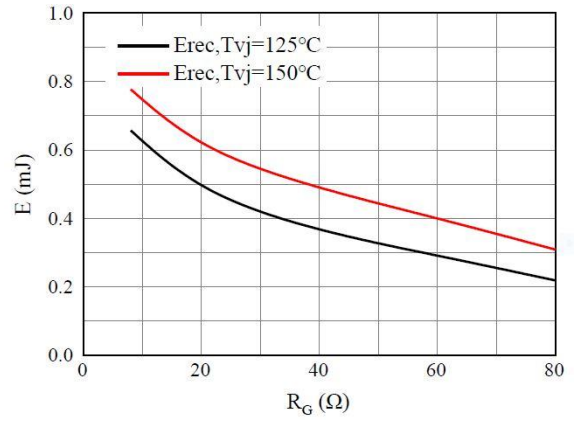
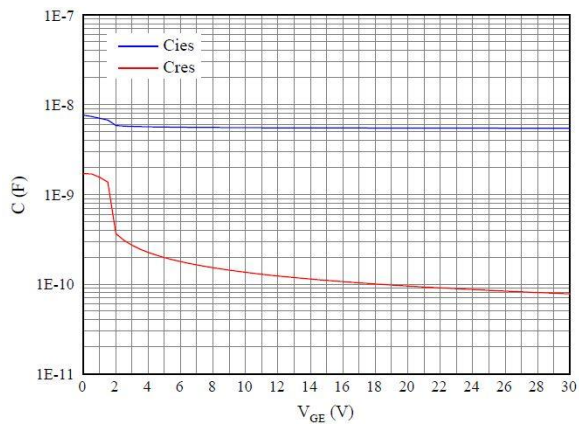


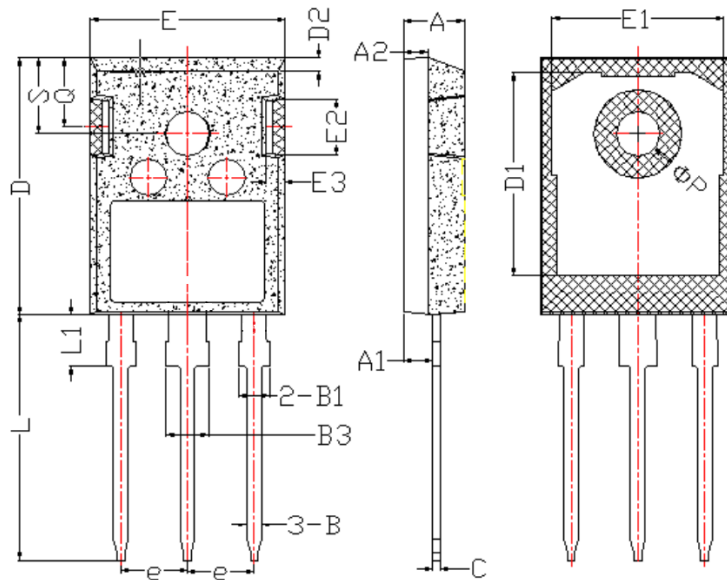
Fig.9 Capacitance characteristic





PACKAGE INFORMATION

Dimension in TO-247 (Unit: mm)



Symbol	Min.	Max.
A	4.900	5.100
A1	2.310	5.510
A2	1.900	2.100
B	1.150	1.250
B1	1.950	2.250
B3	2.950	3.250
C	0.550	0.650
D	20.900	21.100
D1	16.350	16.750
D2	1.050	1.350
E	15.700	15.900
E1	13.100	13.400
E2	4.900	5.100
E3	2.400	2.600
e	5.400	5.480
L	19.800	20.100
L1	-	4.300
ΦP	3.500	3.700
Q	5.60	6.00
S	6.05	6.25



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