DESCRIPTION

The AM75T65 is available in TO-247 Package.

V_{CES}	I_C	V_{CE}	P_D
650V	75A	1.63V	395W

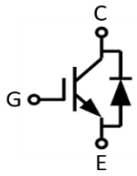
FEATURES

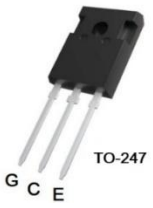
- 650V grooved gate/field termination process.
- Low switching loss
- Positive temperature coefficient

APPLICATION

- Charging pile
- UPS
- Inverter

PIN DESCRIPTION





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

ORDERING INFORMATION

Package Type	Part Number	
TO-247 SPQ:30pcs/Tube, 600pcs/Box	TL3F	AM75T65TL3FVU
Note	U: Tube V: Halogen free Package	
AiT provides all RoHS products		

ABSOLUTE MAXIMUM RATINGS

IGBT

Parameter		Symbol	Value	Units
Collector-Emitter Voltage	T_{vj}=25℃	V_{CES}	650	V
Continuous DC Collector Current	T_C=100℃ , T_{vj} max=175℃	I_{CNOM}	75	A
Repetitive Peak Collector Current	t_P=1 ms	I_{CRM}	150	A
Total Power Dissipation	T_C = 25℃ , T_{vj} max = 175℃	P_{TOT}	395	W
Gate Emitter Voltage		V_{GE}	±20	V

Diode

Parameter		Symbol	Value	Units
Repetitive Peak Reverse Voltage	T_{vj}=25℃	V_{RRM}	650	V
Continuous DC Forward Current	T_C=100℃ , T_{vj} max=175℃	I_F	75	A
Repetitive Peak Forward Current	t_p=1ms	I_{FRM}	120	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=75A ,T_{vj}=25℃		-	1.63	2.10	V
		V_{GE}=15V, I_C=75A ,T_{vj}=125℃		-	2.03	-	
		V_{GE}=15V, I_C=75A ,T_{vj}=150℃		-	2.13	-	
Gate-Emitter Threshold Voltage	$V_{GE\ (TH)}$	I_C=0.75mA, V_{GE}= V_{CE} ,T_{vj}=25℃		4.2	5.1	6.0	V
Transconductance	G_{FS}	V_{CE}=20V , I_C=75A		-	91	-	S
Input Capacitance	C_{IES}	f=1MHz, V_{CE}=25V, V_{GE}=0V,T_{vj}=25℃		-	7.44	-	nF
Output Capacitance	C_{OES}			-	0.24	-	
Reverse Transfer Capacitance	C_{RES}			-	0.13	-	
Collector-Emitter Cut-Off Current	I_{CES}	V_{CES}=650V , V_{GE}= 0V, T_{vj}=25℃		-	-	1	mA
Gate-Emitter Leakage Current	I_{GES}	V_{CES}=0V, V_{GE}= 20V, T_{vj}=25℃		-	-	200	nA
Turn-On Delay Time	$t_{d(on)}$	I_C=50A, V_{CES}=400V V_{GE}=±15V,R_G=8Ω (inductive load)	T_{vj}=25℃	-	34	-	ns
			T_{vj}=125℃	-	37	-	
			T_{vj}=150℃	-	40	-	
Rise Time	t_r	I_C=75A, V_{CES}=400V V_{GE}=±15V,R_G=8Ω (inductive load)	T_{vj}=25℃	-	153	-	
			T_{vj}=125℃	-	157	-	
			T_{vj}=150℃	-	163	-	
Turn-Off Delay Time	$t_{d(off)}$	I_C=75A, V_{CES}=400V V_{GE}=±15V,R_G=8Ω (inductive load)	T_{vj}=25℃	-	183	-	
			T_{vj}=125℃	-	198	-	
			T_{vj}=150℃	-	208	-	
Fall Time	t_f	I_C=75A, V_{CES}=400V V_{GE}=±15V,R_G=8Ω (inductive load)	T_{vj}=25℃	-	67	-	
			T_{vj}=125℃	-	68	-	
			T_{vj}=150℃	-	73	-	
Turn-On Energy Loss Per Pulse	E_{ON}	I_C=75A, V_{CES}=400V V_{GE}=±15V,R_G=8Ω (inductive load)	T_{vj}=25℃	-	4.28	-	mJ
			T_{vj}=125℃	-	4.35	-	
			T_{vj}=150℃	-	4.57	-	
Turn-Off Energy Loss Per Pulse	E_{OFF}	I_C=75A, V_{CES}=400V V_{GE}=±15V,R_G=8Ω (inductive load)	T_{vj}=25℃	-	1.08	-	
			T_{vj}=125℃	-	1.12	-	
			T_{vj}=150℃	-	1.20	-	
IGBT Thermal Resistance, Junction	R_{thJC}			-	0.38	-	K/W
Temperature Under Switching Conditions	T_{vjop}			-40		175	℃

Diode

Parameter	Symbol	Conditions		Min	Typ.	Max	Unit
Forward Voltage	V_F	I_F=75A,V_{GE}=0V,T_{vj}=25℃		-	1.48	2.0	V
		I_F=75A,V_{GE}=0V,T_{vj}=125℃		-	1.61	-	
		I_F=75A, V_{GE}=0V,T_{vj}=150℃		-	1.62	-	
Peak Reverse Recovery Current	I_{RM}	I_F=75A, -d_{iF}/dt=462A/μs(T_{vj}=150℃) V_R=400V, V_{GE}=-15V	T_{vj}=25℃	-	17	-	A
			T_{vj}=125℃	-	23	-	
			T_{vj}=150℃	-	25	-	
Reverse Recovered Charge	Q_{rr}	I_F=75A, -d_{iF}/dt=462A/μs(T_{vj}=150℃) V_R=400V, V_{GE}=-15V	T_{vj}=25℃	-	2.43	-	μC
			T_{vj}=125℃	-	3.37	-	
			T_{vj}=150℃	-	3.72	-	
Reverse Recovery Time	t_{rr}	I_F=75A, -d_{iF}/dt=462A/μs(Tvj=150℃) V_R=400V, V_{GE}=-15V	T_{vj}=25℃	-	200	-	ns
			T_{vj}=125℃	-	211	-	
			T_{vj}=150℃	-	227	-	
Reverse Recovered Energy	E_{rec}	I_F=75A, -d_{iF}/dt=462A/μs(T_{vj}=150℃) V_R=400V, V_{GE}=-15V	T_{vj}=25℃	-	0.68	-	mJ
			T_{vj}=125℃	-	0.91	-	
			T_{vj}=150℃	-	0.99	-	
Diode Thermal Resistance Junction	R_{thJC}			-	0.45	-	K/W
Temperature Under Switching Conditions	$T_{vj\ op}$			-40	-	175	℃

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Typical Output Characteristics (V_{GE}=15V)

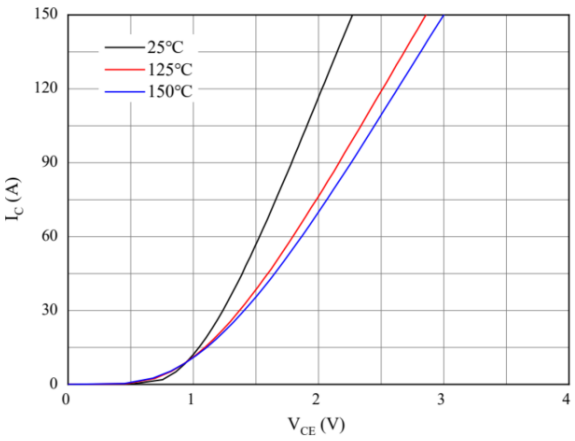


Fig . Typical Output Characteristics (Tvj=150℃)

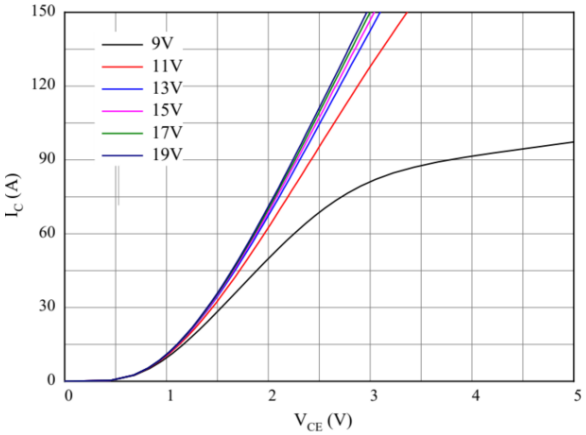


Fig 3. Typical Transfer Characteristic (V_{CE}=20V)

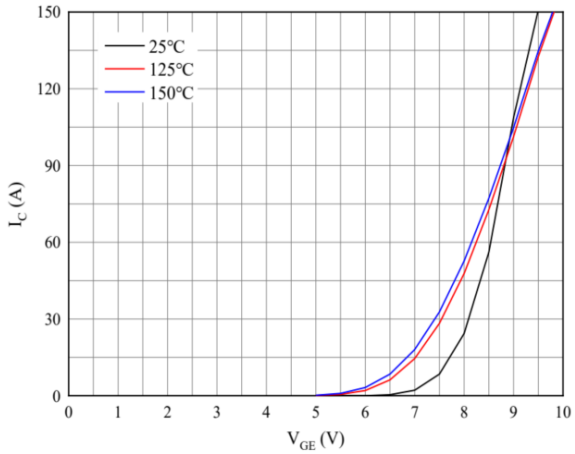


Fig 4. Forward Characteristic of Diode

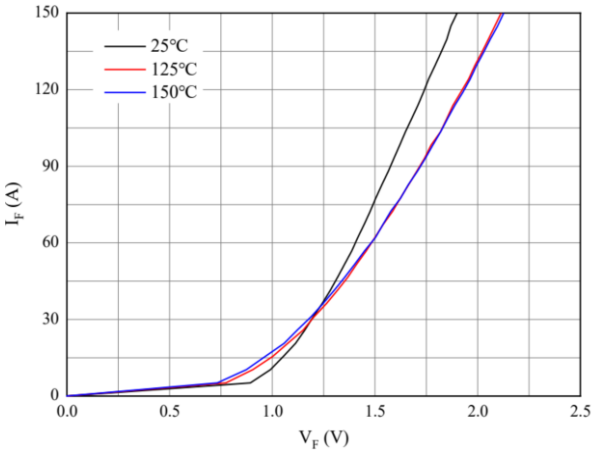


Fig 5. Switching losses of IGBT

V_{GE}=±15V, R_{gon}=8Ω, R_{goff}=8Ω, V_{CES}=400V

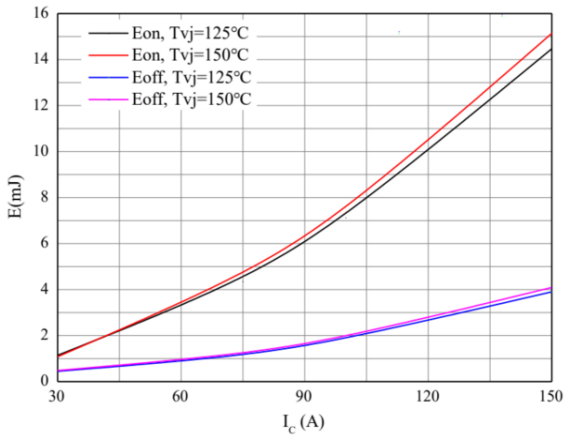


Fig 6. Switching losses of IGBT

V_{GE}=±15V, I_C=75A, V_{CES}=400V

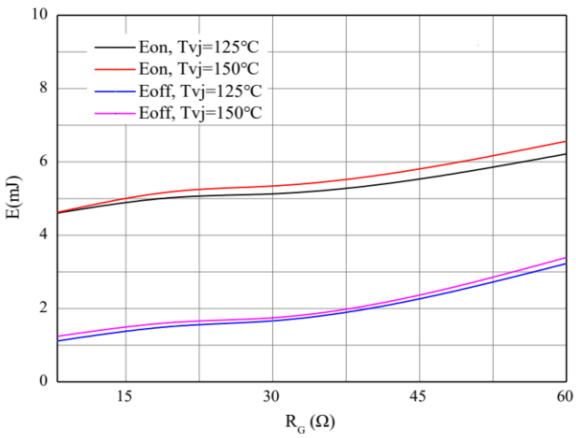


Fig 7. Switching Losses of Diode

R_{gon}=8Ω, V_{CES}=400V

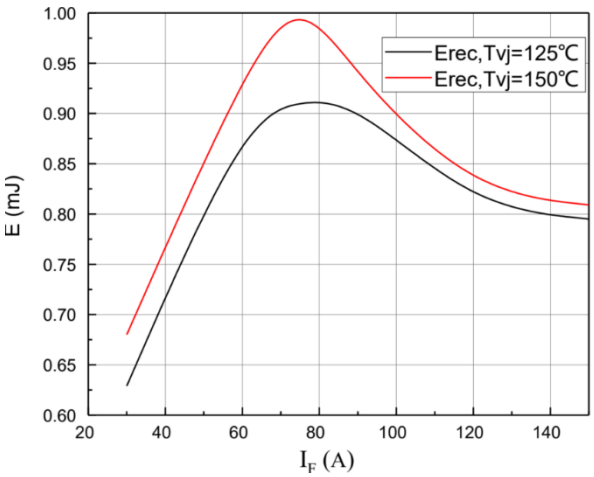


Fig 8. Switching Losses of Diode

I_F=75A, V_{CES}=400V

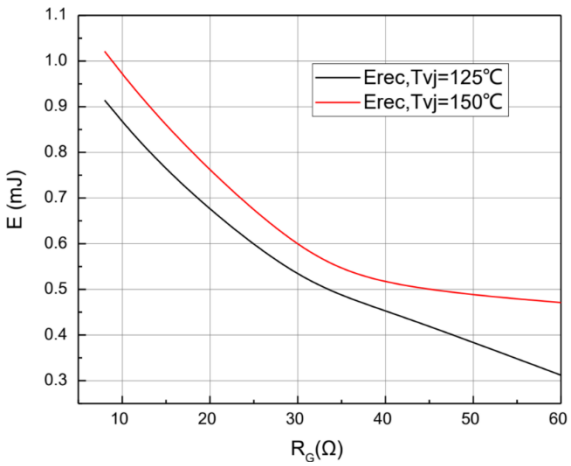
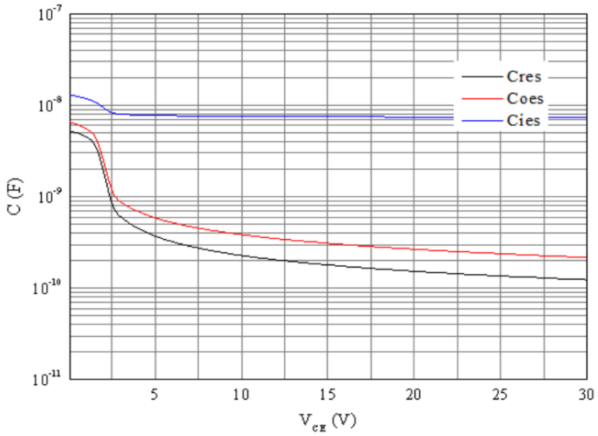
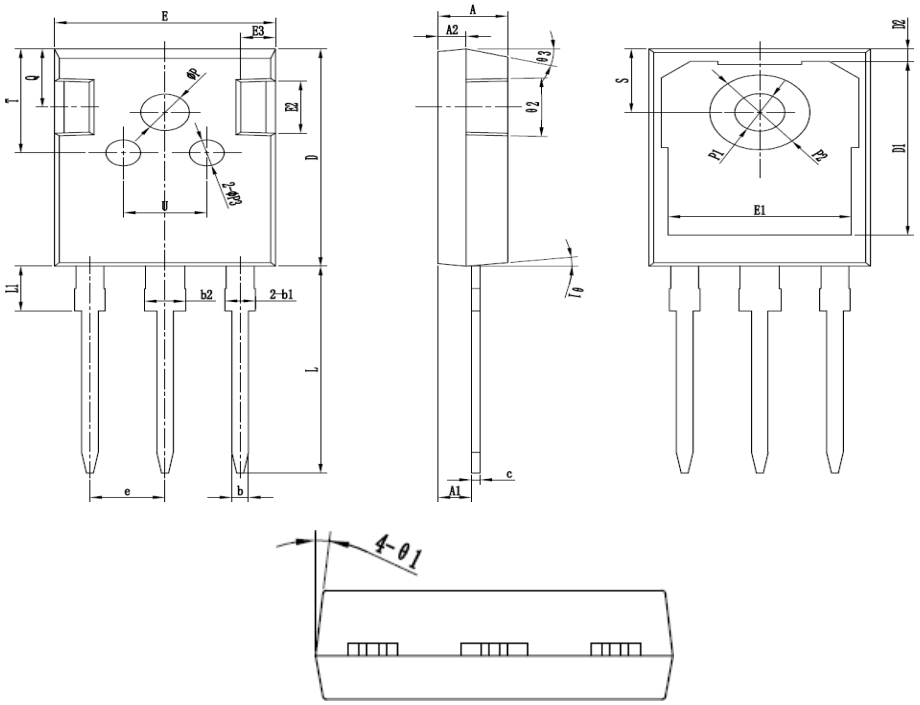


Fig 9. Capacitance Characteristic



PACKAGE INFORMATION

Dimension in TO-247 (Unit: mm)



Symbol	MILLIMETER		Symbol	MILLIMETER	
	Min.	Max.		Min.	Max.
A	4.900	5.100	L	19.800	20.100
A1	2.310	2.510	L1	-	4.300
A2	1.900	2.100	ΦP	3.700	3.900
b	1.150	1.250	ΦP1	3.500	3.700
b1	1.950	2.250	ΦP2	3.700	3.900
b2	2.950	3.250	ΦP3	7.000	7.400
c	0.550	0.650	Q	5.600	6.000
D	20.900	21.100	S	6.050	6.250
D1	16.350	16.750	J	9.800	10.200
D2	1.050	1.350	U	6.000	6.400
E	15.700	15.900	θ1	5°	9°
E1	13.100	13.400	θ2	1°	5°
E2	4.900	5.100	θ3	13°	17°
E3	2.400	2.600			
e	5.400	5.480			

IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc. integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or server property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.