

Product Summary

$V_{(BR)CES}$	$V_{CE(SAT)TYP}$	$I_C(100^{\circ}C)$
1350V	2V@15V	25A

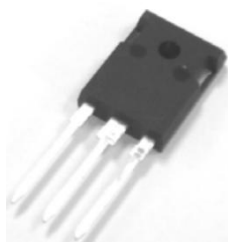
Feature

- Trench and field-stop technology
- High speed switching
- Positive $V_{CE(sat)}$ temperature coefficient
- Fast switching and short tail current
- High ruggedness performance

Application

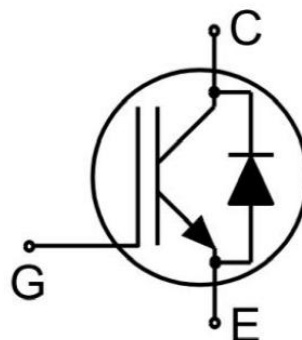
- Induction cooking
- Resonant converters

Package

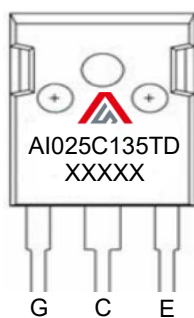


TO-247AB

Circuit diagram



Marking



Absolute maximum ratings (T_c=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CES}	1350	V
Continuous Gate- Emitter Voltage	V _{GE}	±20	V
Collector Current	I _C	50	A
Collector Current (T _c =100°C)	I _C (100°C)	25	A
Pulsed Collector Current, tp limited by T _{jmax}	I _{CM}	100	A
Diode Continuous Forward Current (T _c =100°C)	I _F (100°C)	25	A
Diode Maximum Current, tp limited by T _{jmax}	I _{FM}	100	A
Power Dissipation	P _D	416	W
Thermal Resistance, Junction to case for Diode	R _{θJC}	1.4	°C/ W
Thermal Resistance, Junction to case for IGBT	R _{θJC}	0.36	°C/ W
Operating junction temperature range	T _J	-40 ~ +175	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Electrical characteristics of the IGBT (T_J=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Collector-Emitter Breakdown Voltage	V _{(BR)CES}	V _{GE} =0V, I _C =250μA	1350			V
Collector-Emitter Leakage Current	I _{CES}	V _{GE} =0V, V _{CE} =1350V			100	μA
Gate to Emitter Leakage Current	I _{GES}	V _{GE} =±20V, V _{CE} =0V			±100	nA
Gate Threshold Voltage	V _{GE(th)}	V _{GE} =V _{CE} , I _C =1mA	5	5.4	6	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =15V, I _C =25A		2		V
		V _{GE} =15V, I _C =25A, T _J =175°C		2.5		
Dynamic characteristics						
Input Capacitance	C _{ies}	V _{CE} =30V, V _{GE} =0V, f =1MHz		4530		pF
Output capacitance	C _{oes}			54		
Reverse Transfer Capacitance	C _{res}			25		
Total Gate Charge	Q _g	V _{CC} =1080V, V _{GE} =15V, I _C =25A		147		nC
Turn-off delay time	t _{d(off)}	V _{CC} =600V, V _{GE} =0V/15V I _C =25A, R _G =10Ω Inductive load		181		ns
Turn-off fall time	t _f			126		ns
Turn-Off Switching Loss	E _{off}			1.1		mJ
Turn-off delay time	t _{d(off)}	V _{CC} =600V, V _{GE} =0V/15V I _C =25A, R _G =10Ω Inductive load T _J =175°C		209		ns
Turn-off fall time	t _f			215		ns
Turn-Off Switching Loss	E _{off}			1.5		mJ

Electrical characteristics of the Diode (T_J=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V _F	I _F =25A		2.6		V
		I _F =25A, T _J =175°C		2.4		

Typical Characteristics

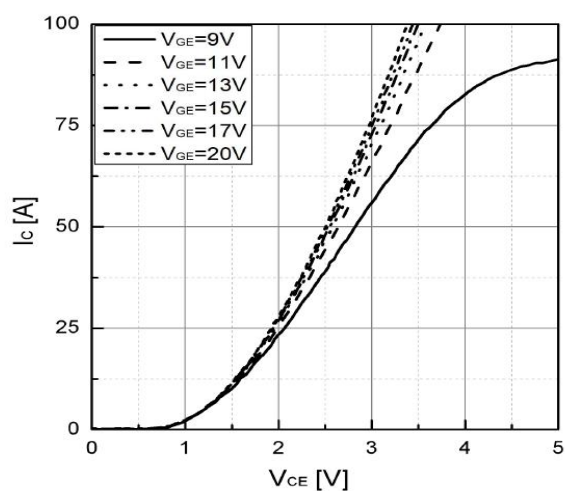


Fig 1. Typical output characteristic ($T_{vj}=25^{\circ}\text{C}$)

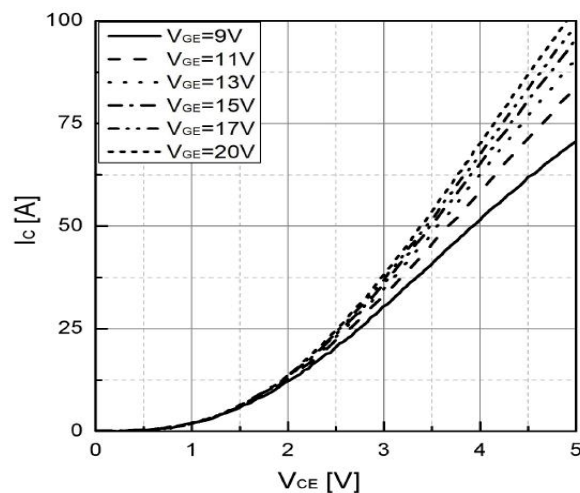


Fig 2. Typical output characteristic ($T_{vj}=175^{\circ}\text{C}$)

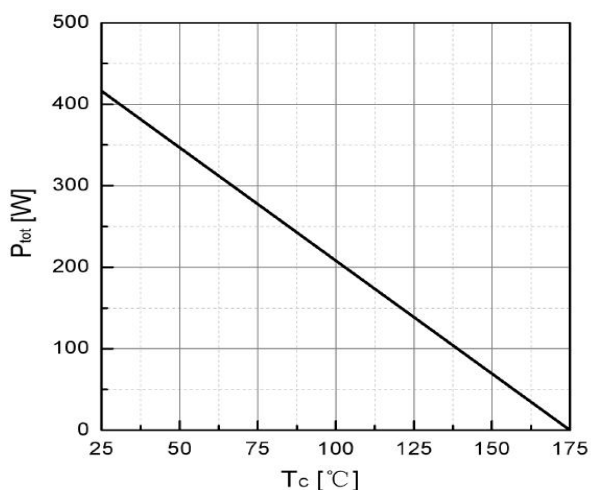


Fig 3. Power dissipation as a function of T_c

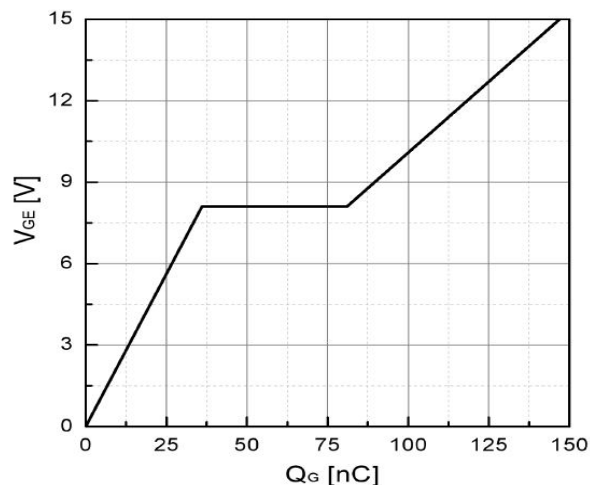


Fig 4. Typical Gate charge

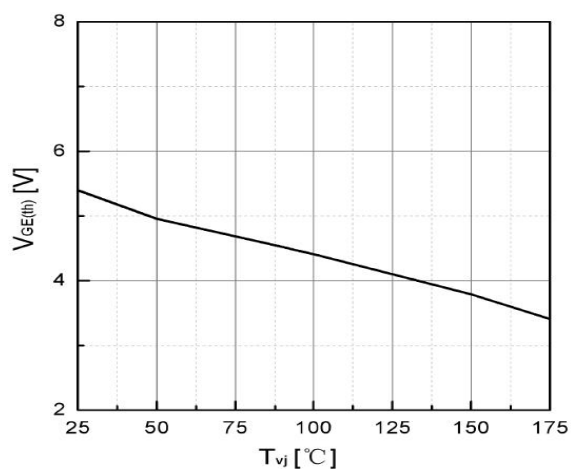


Fig 5. Typical $V_{GE(th)}$ as a function of T_{vj}
($I_C=1\text{mA}$)

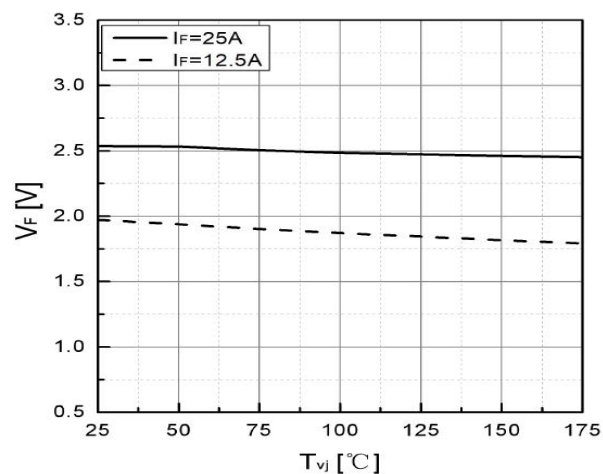


Fig 6. Typical V_F as a function of T_{vj}

Typical Characteristics

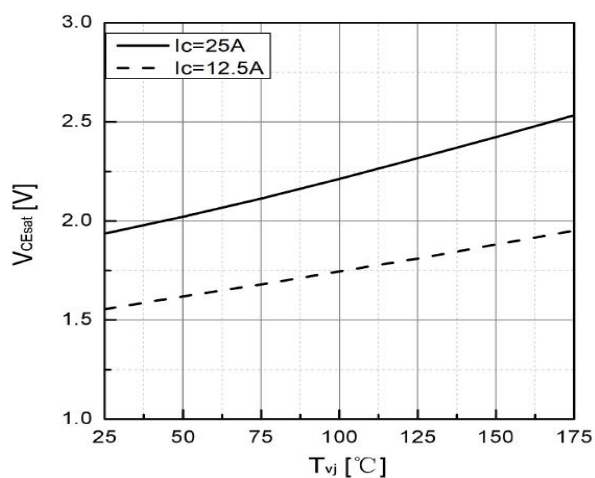


Fig 7. Typical $V_{CE(sat)}$ as a function of T_{vj}

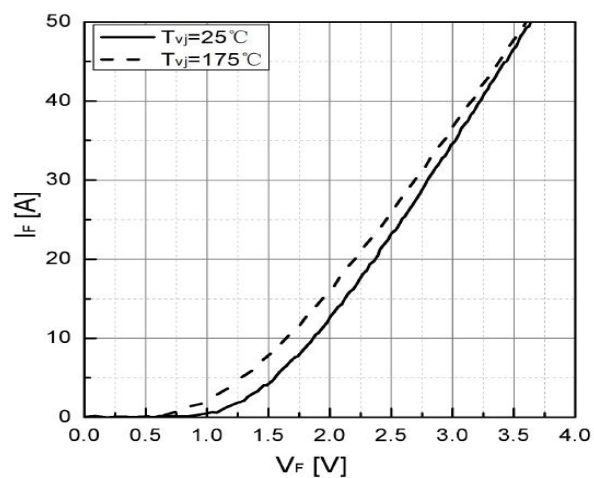


Fig 8. Typical I_F as a function of V_F

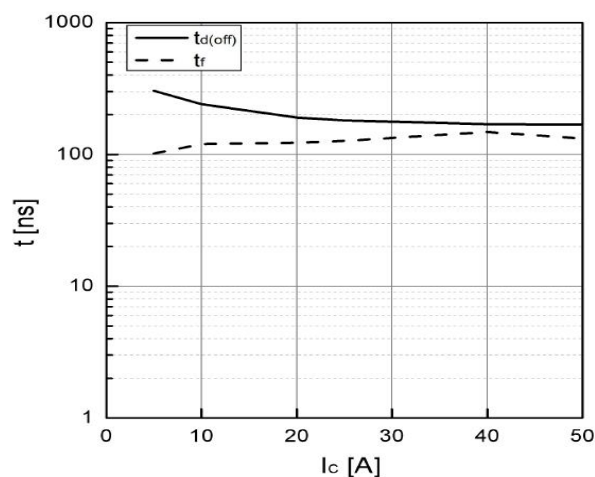


Fig 9. Typical switching time as a function of I_c

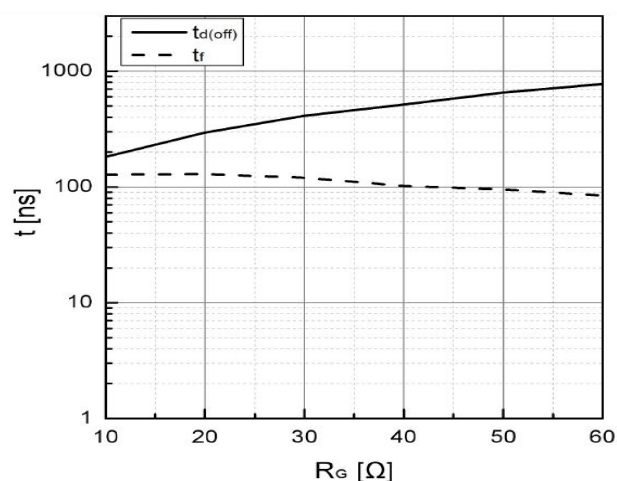


Fig 10. Typical switching times as a function of R_G

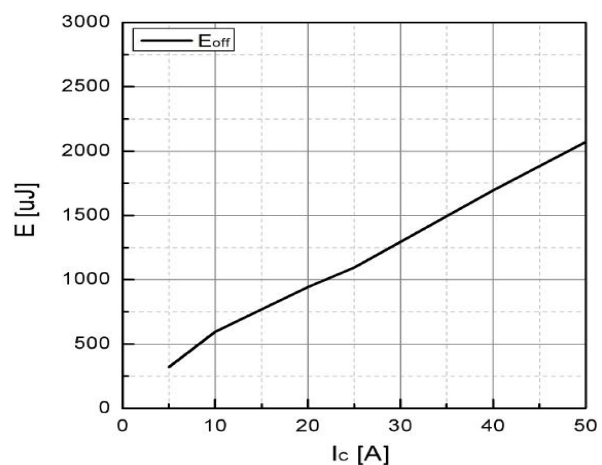


Fig 11. Typical switching energy losses as a function of I_c

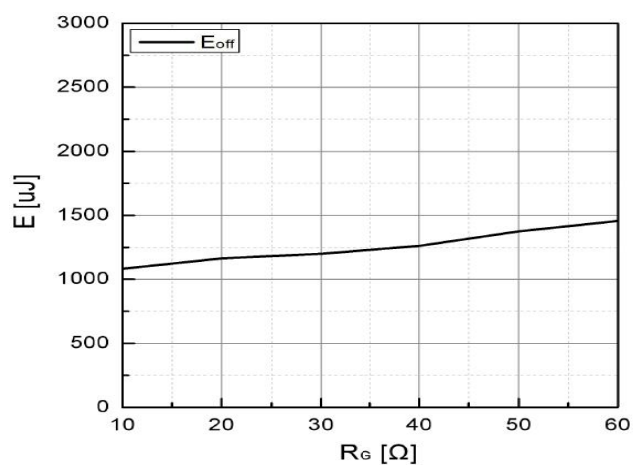


Fig 12. Typical switching energy losses as a function of R_G

Typical Characteristics

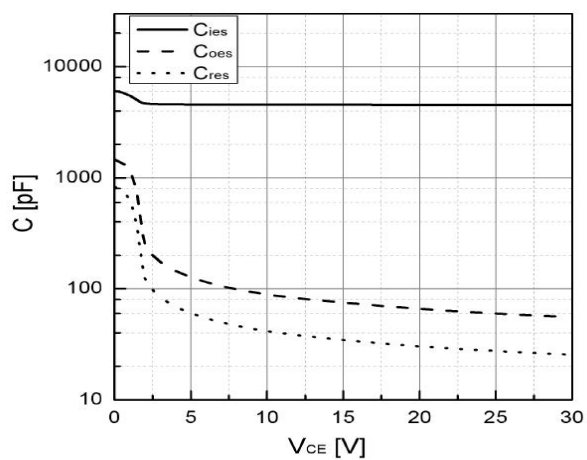


Fig 13. Typical capacitance as a function of V_{CE}
($f=1\text{MHz}$, $V_{GE}=0\text{V}$)

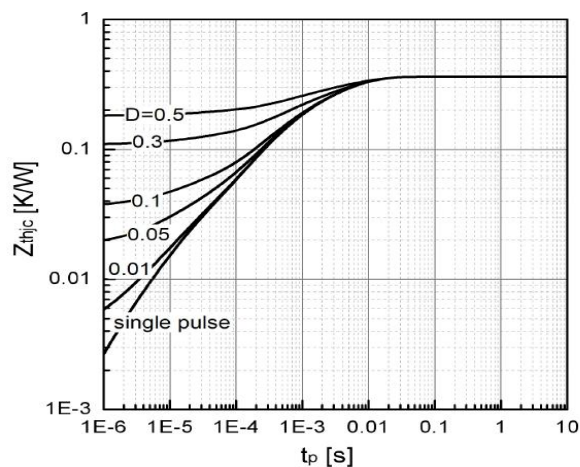
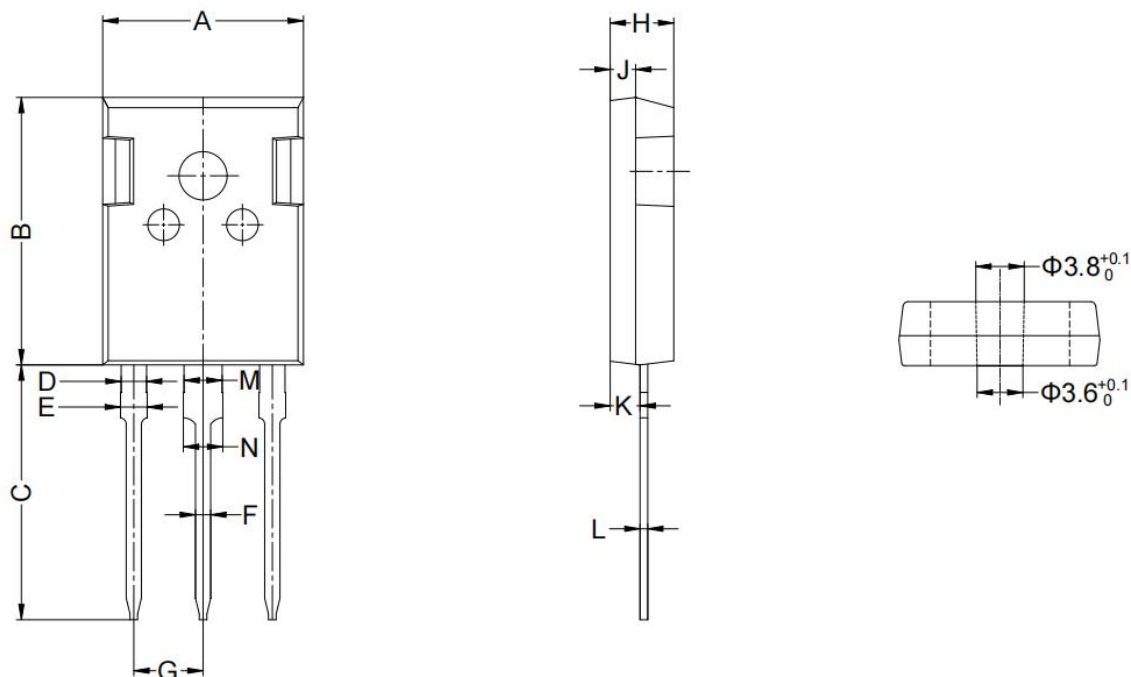


Fig 14. Transient thermal impedance of IGBT

TO-247AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	15.500	16.100	0.610	0.634
B	20.800	21.200	0.819	0.835
C	19.700	20.300	0.776	0.799
D	1.800	2.200	0.071	0.087
E	1.900	2.300	0.075	0.091
F	1.000	1.400	0.039	0.055
G	5.250	5.650	0.207	0.222
H	4.800	5.200	0.189	0.205
J	1.900	2.100	0.075	0.083
K	2.200	2.500	0.087	0.098
L	0.410	0.790	0.016	0.031
M	2.800	3.200	0.110	0.126
N	2.900	3.300	0.114	0.130