

Product Summary

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

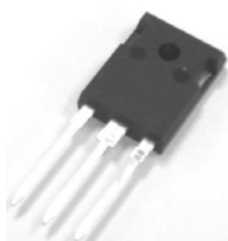
Feature

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

Application

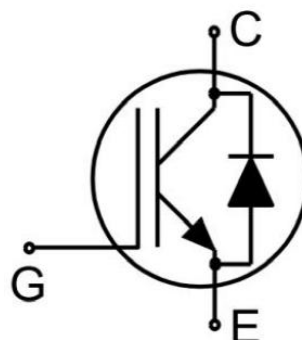
- Induction cooking
- Resonant converters

Package

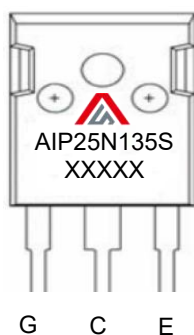


TO-247AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CES}	1350	V
Continuous Gate- Emitter Voltage	V_{GES}	± 20	V
Collector Current	I_C	50	A
Collector Current(T _C =100°C)	$I_C(100^\circ\text{C})$	25	A
Pulsed Collector Current, tp limited by T _{vjmax}	I_{CM}	100	A
Diode Continuous Forward Current(T _C =100°C)	$I_F(100^\circ\text{C})$	25	A
Diode Forward Pulsed Current,tp limited by T _{vjmax}	I_{Fpuls}	100	A
Power Dissipation	P_D	416	W
Thermal Resistance, Junction to case for Diode	$R_{\theta JC}$	1.4	°C/W
Thermal Resistance, Junction to case for IGBT	$R_{\theta JC}$	0.36	°C/W
Junction Temperature Range	T_{vj}	-40 ~ +175	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical characteristics of the IGBT (T_{vj}=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	$V_{GE} = 0V, I_{CE} = 250\mu A$	1350			V
Collector-Emitter Leakage Current	I_{CES}	$V_{GE} = 0V, V_{CE} = 1350V$			100	μA
Gate to Emitter Leakage Current	I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0V$			± 100	nA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE} = 15V, I_C = 25A$		2.0		V
		$V_{GE} = 15V, I_C = 25A, T_{vj} = 175^\circ\text{C}$		2.5		
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C = 1mA$	5.0	5.4	6.0	V
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-on delay time	$t_{d(off)}$	$V_{CC} = 600V, V_{GE} = 0V/15V, I_C = 25A, R_G = 10\Omega, \text{Inductive load}$		181		nS
Turn-on rise time	t_f			126		
Turn-off Switching Energy	E_{off}			1.1		
Turn-on delay time	$t_{d(off)}$	$V_{CC} = 600V, V_{GE} = 0V/15V, I_C = 25A, R_G = 10\Omega, \text{Inductive load, } T_{vj} = 175^\circ\text{C}$		209		nS
Turn-on rise time	t_f			215		
Turn-off Switching Energy	E_{off}			1.5		

Electrical characteristics of the Diode (T_{vj}=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_F	$I_F = 25A$		2.6		V
		$I_F = 25A, T_{vj} = 175^\circ\text{C}$		2.4		

Typical Characteristics

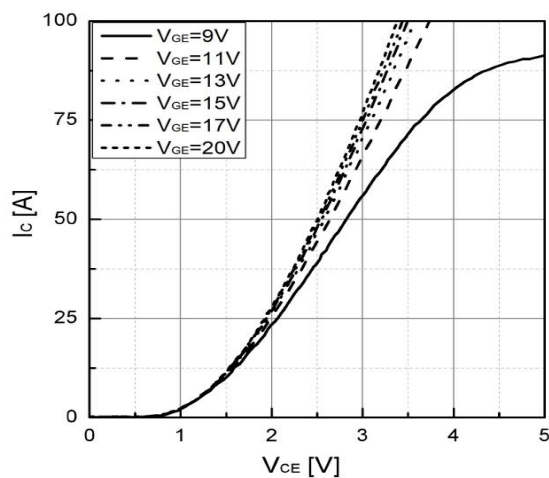


Fig 1. Typical output characteristic ($T_{vj}=25^{\circ}\text{C}$)

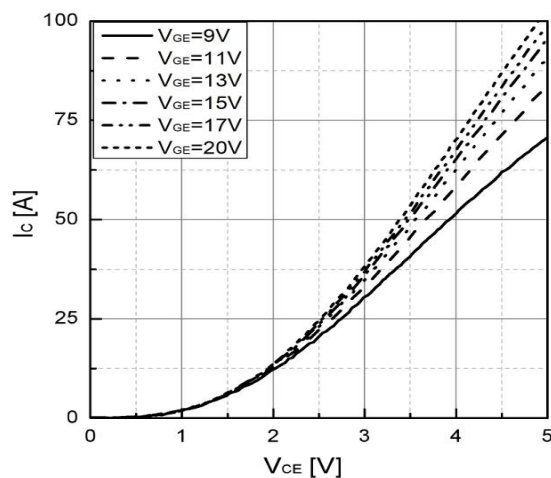


Fig 2. Typical output characteristic ($T_{vj}=175^{\circ}\text{C}$)

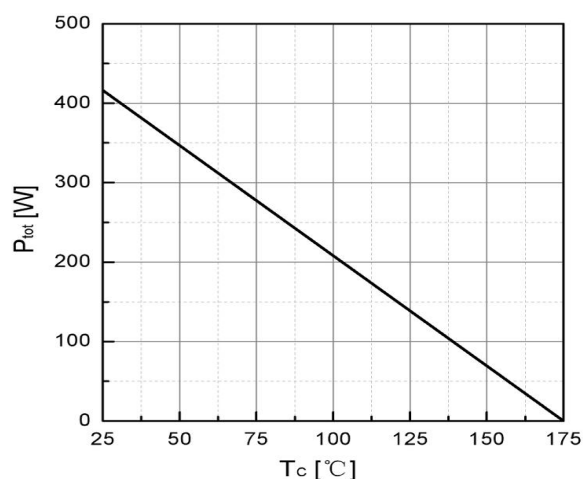


Fig 3. Power dissipation as a function of T_c

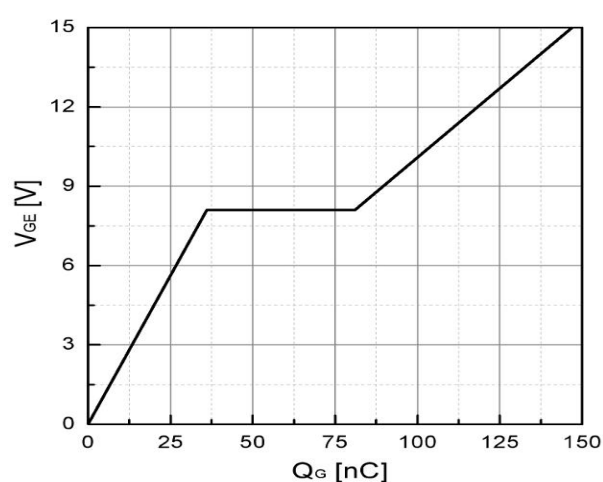


Fig 4. Typical Gate charge

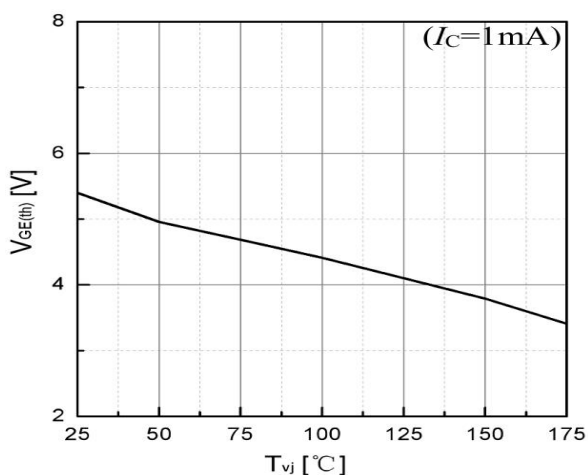


Fig 5. Typical $V_{GE(th)}$ as a function of T_{vj}

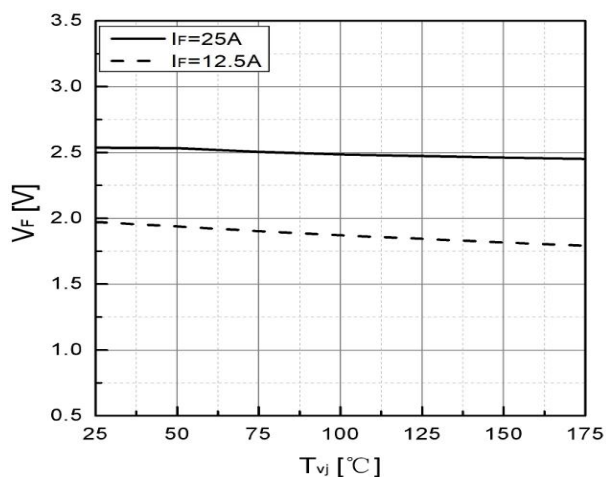


Fig 6. Typical V_F as a function of T_{vj}

Typical Characteristics

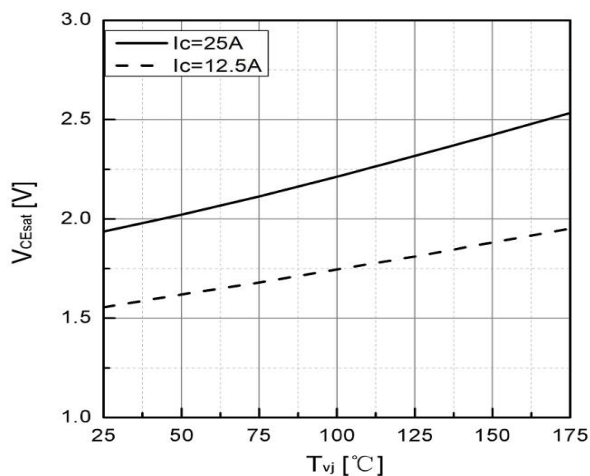


Fig 7. Typical V_{CEsat} as a function of T_{vj}

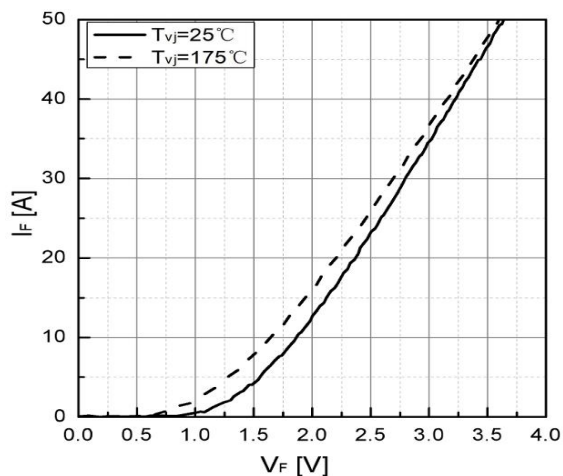


Fig 8. Typical I_F as a function of V_F

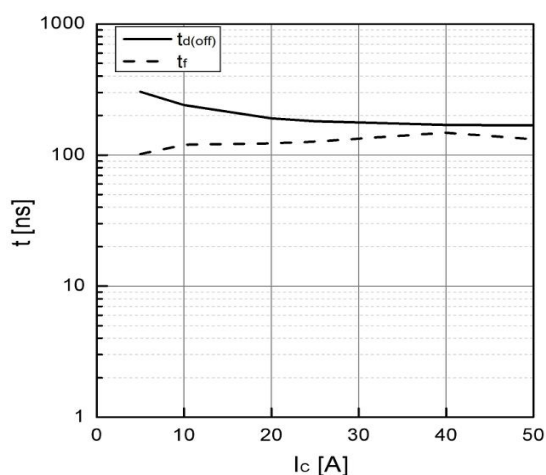


Fig 9. Typical switching time as a function of I_c

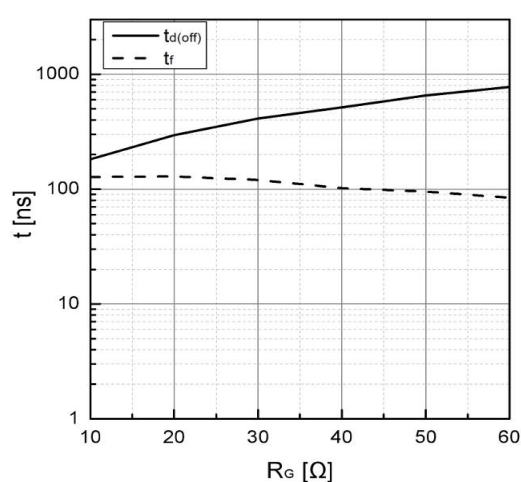


Fig 10. Typical switching times as a function of R_G

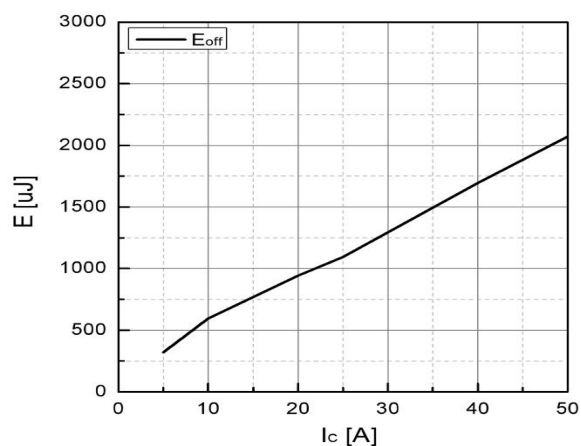


Fig 11. Typical switching energy losses as a function of I_c

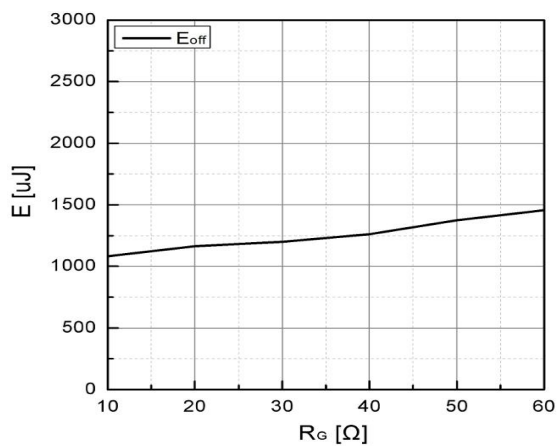


Fig 12. Typical switching energy losses as a function of R_G

Typical Characteristics

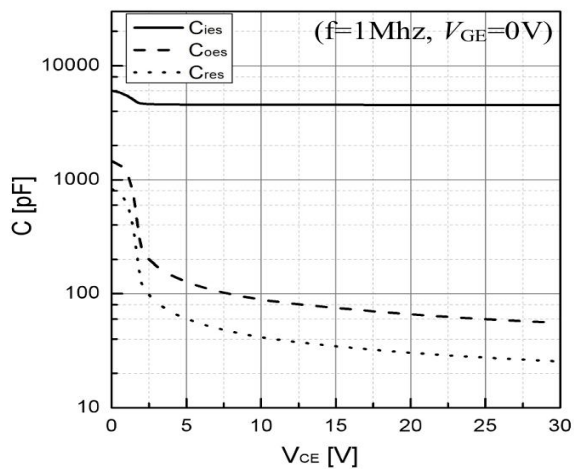


Fig 13. Typical capacitance as a function of V_{CE}

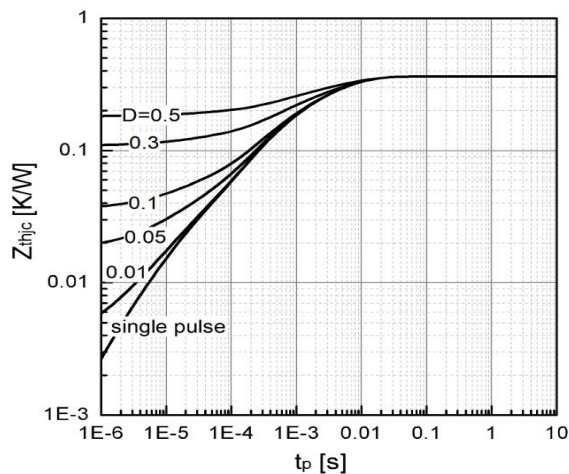
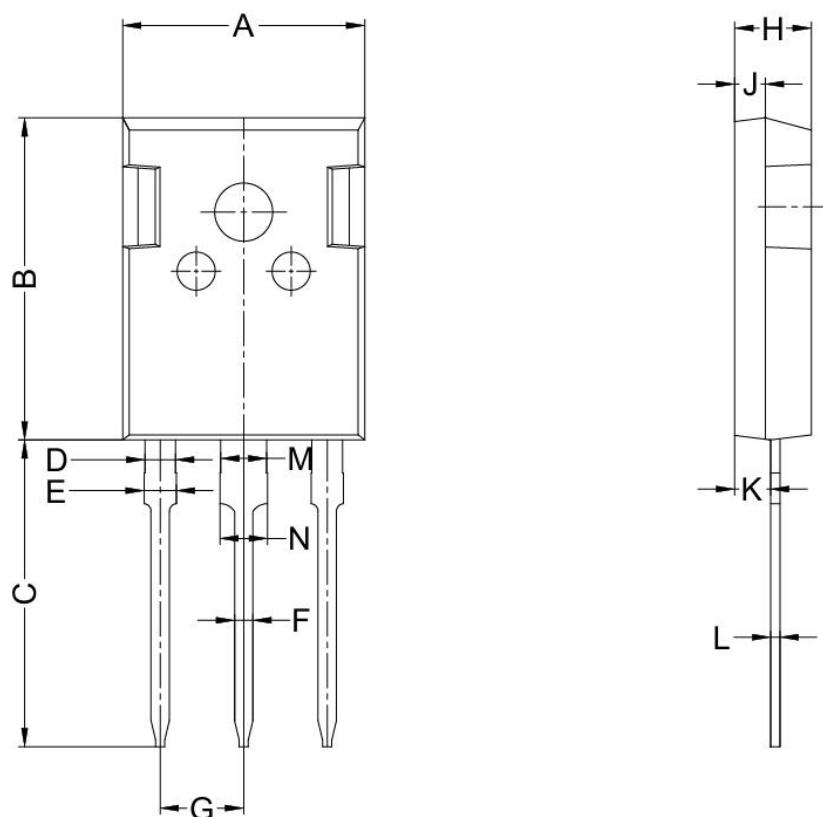


Fig 14. Transient thermal impedance of IGBT

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