

Key performance:

- $V_{CE} = 650V$
- $I_C = 60A @ T_C = 100$
- $V_{CE(sat)} = 1.9V$

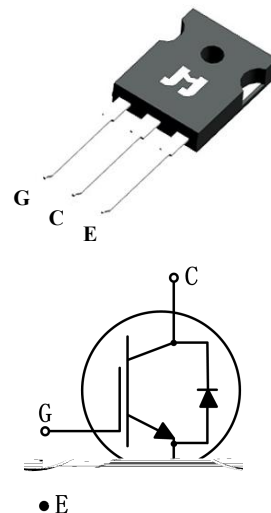
TO-247

Features:

- Trench and field-stop technology.
- Easy parallel switching capability.

Benefits:

- High efficiency for inverters.
- High ruggedness performance.
- RoHS compliant.



Applications:

- PFC applications
- Uninterruptible power supplies
- Solar inverters

Package parameters

Type	Marking	Package	Packaging Method
JJT60N65HE	T6065HE	TO-247	Tube



Symbol	Parameter	Values	Unit
V_{CES}	Collector-emitter voltage	650	V
V_{GES}	Gate-emitter voltage	± 20	V
I_C	Continuous collector current ($T_C=25\text{ }^{\circ}\text{C}$)	120	A
	Continuous collector current ($T_C=100\text{ }^{\circ}\text{C}$)	60	A
I_{CM}	Pulsed collector current, t_p limited by T_{vjmax}	240	A
I_F	Diode continuous forward current ($T_C=100\text{ }^{\circ}\text{C}$)	60	A
I_{FM}	Diode maximum current, t_p limited by T_{vjmax}	240	A
P_{tot}	Power dissipation ($T_C=25\text{ }^{\circ}\text{C}$)	333	W
	Power dissipation ($T_C=100\text{ }^{\circ}\text{C}$)	167	W
T_{vj}	Operating junction temperature ra		
o			





Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
BV_{CES}	Collector-emitter breakdown voltage	$V_{GE}=0V, I_C=250\text{ A}$	650	-	-	V
I_{CES}	Collector-emitter leakage current	$V_{CE}=650V, V_{GE}$				

Switching characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
$t_{d(on)}$	Turn-on delay time	$V_{CC}=400V$ $V_{GE}=0/15V$ $I_C=60A$ $R_G=10\Omega$ Inductive load	-	44	-	ns
t_r	Rise time		-	100	-	ns
$t_{d(off)}$	Turn-off delay time		-	166	-	ns
t_f	Fall time		-	75	-	ns
E_{on}	Turn-on energy		-	2.3	-	mJ
E_{off}	Turn-off energy		-	1.3	-	mJ
E_{ts}	Total switching energy		-	3.6	-	mJ
$t_{d(on)}$	Turn-on delay time	$V_{CC}=400V$ $V_{GE}=0/15V$ $I_C=60A$ $R_G=10\Omega$ Inductive load $T_{vj}=175$	-	45	-	ns
t_r	Rise time		-	105	-	ns
$t_{d(off)}$	Turn-off delay time		-	180	-	ns
t_f	Fall time		-	76	-	ns
E_{on}	Turn-on energy		-	3.6	-	mJ
E_{off}	Turn-off energy		-	1.6	-	mJ
E_{ts}	Total switching energy		-	5.2	-	mJ

**Electrical characteristics of Diode** ($T_{vj}=25$ unless otherwise specified)

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
V_F	Diode forward voltage	$I_F=60A$	-	1.7	-	V
		$I_F=60A, T_{vj}=175$	-	1.4	-	V
t_{rr}	Diode reverse recovery time	$V_R=400V$ $I_F=60A$ $di_F/dt=-450A/s$	-	78	-	ns
I_{rrm}	Diode peak reverse recovery current		-	14	-	A
Q_{rr}	Diode reverse recovery charge		-	600	-	nC
t_{rr}	Diode reverse recovery time	$V_R=400V$ $I_F=60A$ $di_F/dt=-450A/s$ $T_{vj}=175$	-	155	-	ns
I_{rrm}	Diode peak reverse recovery current		-	25	-	A
Q_{rr}	Diode reverse recovery charge		-	2300	-	nC

Typical performance characteristics

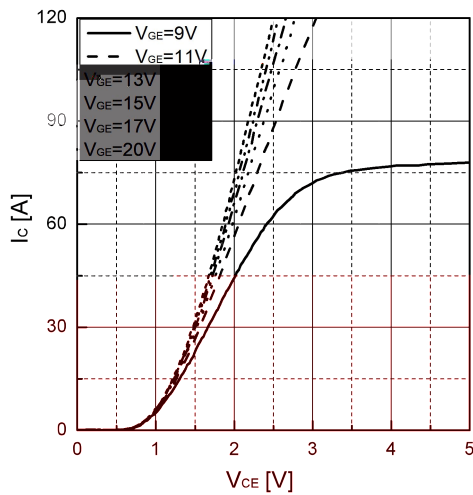


Fig 1. Typical output characteristic ($T_{vj}=25$ °C)

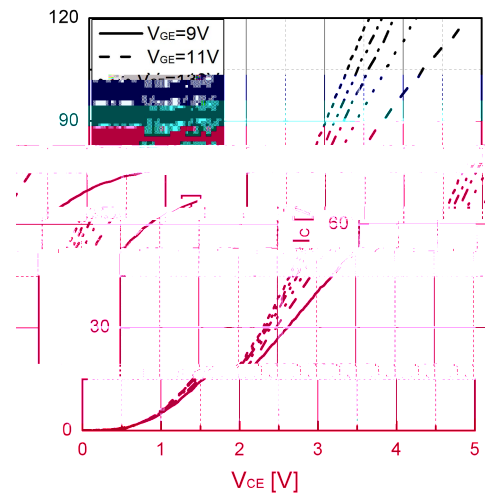


Fig 2. Typical output characteristic ($T_{vj}=175$ °C)

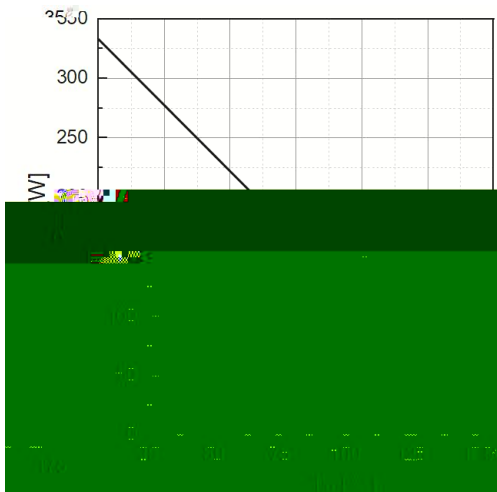


Fig 3. Power dissipation as a function of T_{jc}

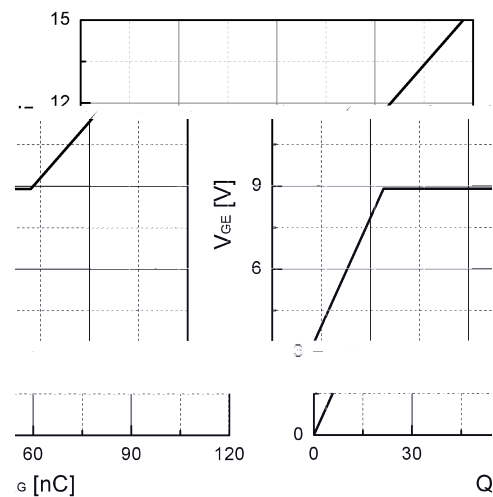


Fig 4. Typical Gate charge

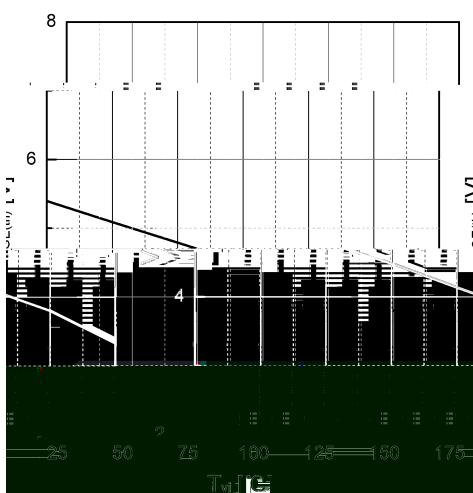


Fig 5. Typical $V_{GE(th)}$ as a function of T_{vj}
($I_C=1mA$)

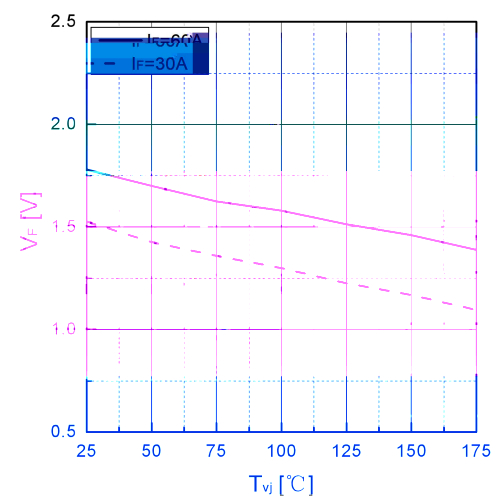


Fig 6. Typical V_F as a function of T_{vj}

Typical performance characteristics

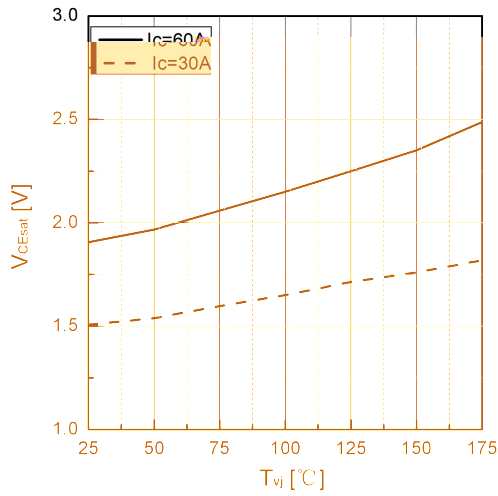


Fig 7. Typical V_{CEsat} as a function of T_{vj}

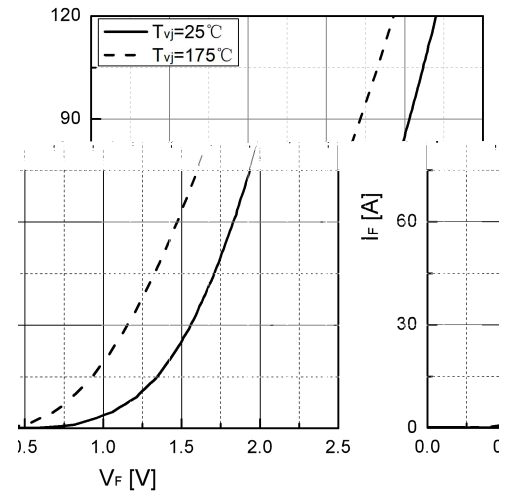


Fig 8. Typical I_F as a function of V_F

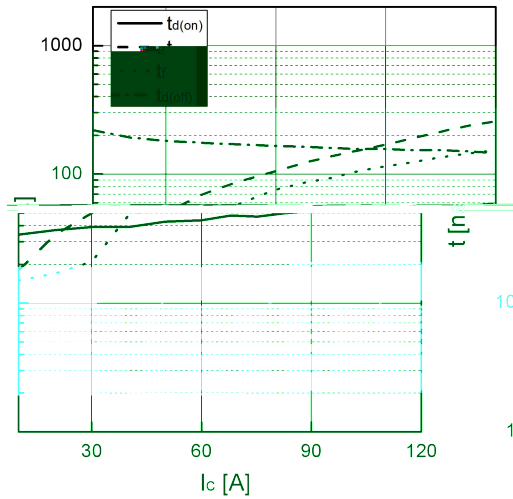


Fig 9. Typical switching time as a function of I_C

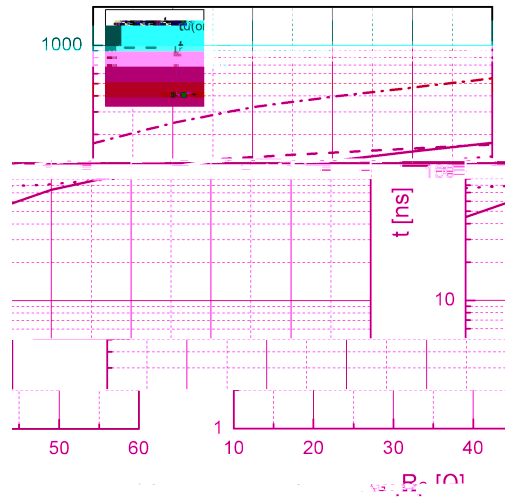


Fig 10. Typical switching times as a function of R_G

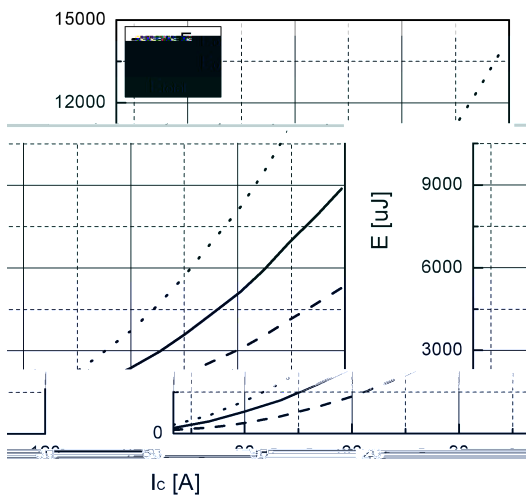


Fig 11. Typical switching energy losses as a function of I_C

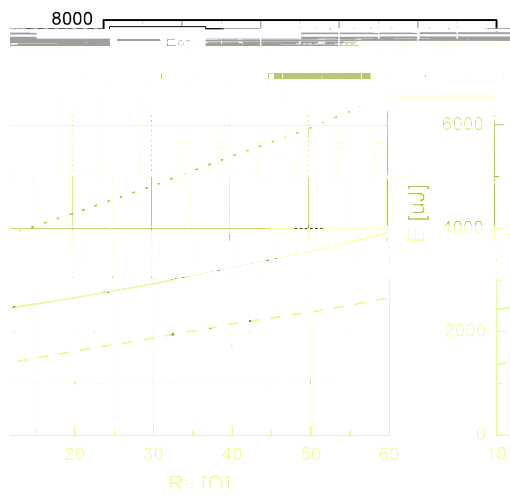


Fig 12. Typical switching energy losses as a function of R_G

Typical performance characteristics

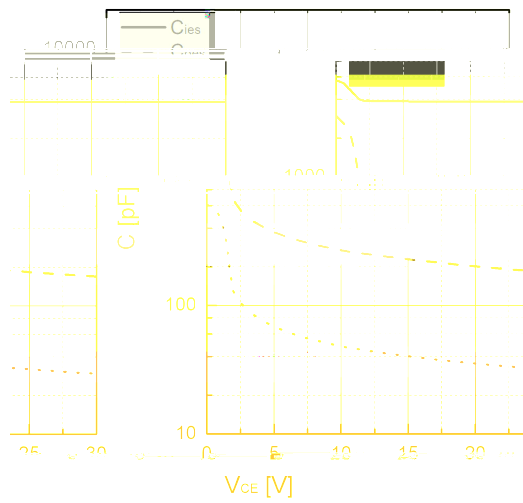


Fig 13. Typical capacitance as a function of V_{CE}
($f=1\text{MHz}$, $V_{GE}=0\text{V}$)

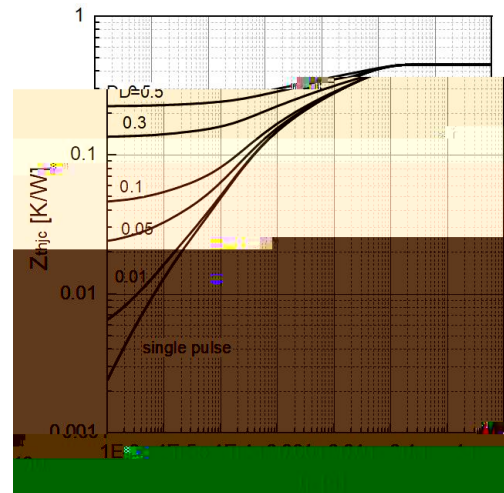


Fig 14. Transient thermal impedance of IGBT

Inches		
in.	Typ.	Max.
610	0.622	0.634
819	0.827	0.835
776	0.787	0.799
071	0.079	0.087
075	0.083	0.091
039	0.047	0.055
207	-	0.222
189	0.197	0.205
075	0.079	0.083
087	0.093	0.098
016	0.024	0.031
110	0.118	0.126
114	0.122	0.130



Revision history

Date	Revision	Changes
2023-12-12	Rev 1.0	Release of the datasheet
2024-03-20	Rev 1.1	Update
2024-05-17	Rev 1.2	Update
2026-06-25	Rev 1.3	Update thermal

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