JJMICROELECTRONICS

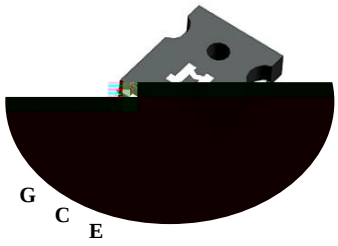
650V 60A Trench and Field Stop IGBT

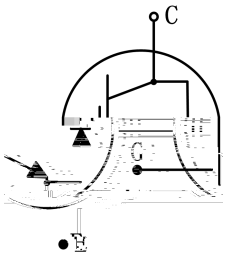
JJT60N65HE

Typ performance

- V_{CE}=650V
- I_C=60A@
- V_{CE}

TO-247





Symbol	Parameter	Values	Unit
V_{CES}	Collector-emitter voltage	650	

A dc f c edad bec eadca e .



A dc f c ad bec e ad ca e .

Switching characteristics

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
d(on)	Turn-on delay time	$_{CC}$=400V $_{GE}$=0/15V $_{C}$=60A $_{G}$=10 Inductive load	-	44	-	ns
r	Rise time		-	100	-	ns
d(off)	Turn-off delay time		-	166	-	ns
f	Fall time		-	75	-	ns
on	Turn-on energy		-	2.3	-	mJ
off	Turn-off energy		-	1.3	-	mJ
ts	Total switching energy		-	3.6	-	mJ
d(on)	Turn-on delay time	$_{CC}$=400V $_{GE}$=0/15V $_{C}$=60A $_{G}$=10 Inductive load $_{vj}$ =175	-	45	-	ns
r	Rise time		-	105	-	ns
d(off)	Turn-off delay time		-	180	-	ns
f	Fall time		-	76	-	ns
on	Turn-on energy		-	3.6	-	mJ
off	Turn-off energy		-	1.6	-	mJ
ts	Total switching energy		-	5.2	-	mJ

Electrical characteristics of Diode (vj=25 unless otherwise specified)

Symbol	Parameter	Test condition	Values			Unit
			Min.	Typ.	Max.	
F	Diode forward voltage	F=60A	-	1.7	-	V
		F=60A, vj=175	-	1.4	-	V
rr	Diode reverse recovery time	R=400V F=60A d F/d =-450A/μs	-	78	-	ns
rrm	Diode peak reverse recovery current		-	14	-	A
rr	Diode reverse recovery charge		-	600	-	nC
rr	Diode reverse recovery time	R=400V F=60A d F/d =-450A/μs vj=175	-	155	-	ns
rrm	Diode peak reverse recovery current		-	25	-	A
rr	Diode reverse recovery charge		-	2300	-	nC

Typical performance characteristics

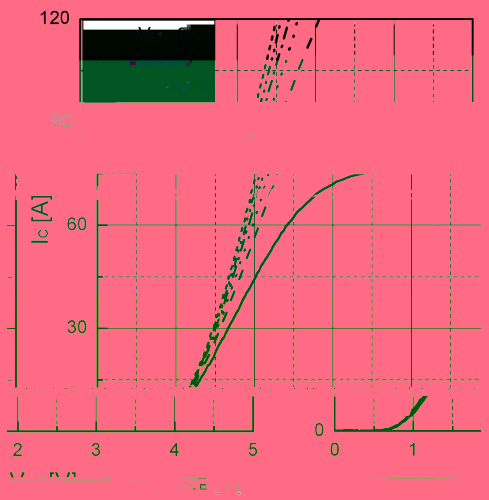


Fig 1. Typical output characteristic (vj=25)

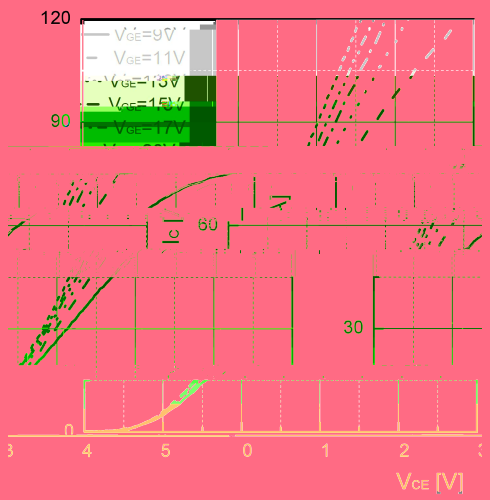


Fig 2. Typical output characteristic(vj=175)

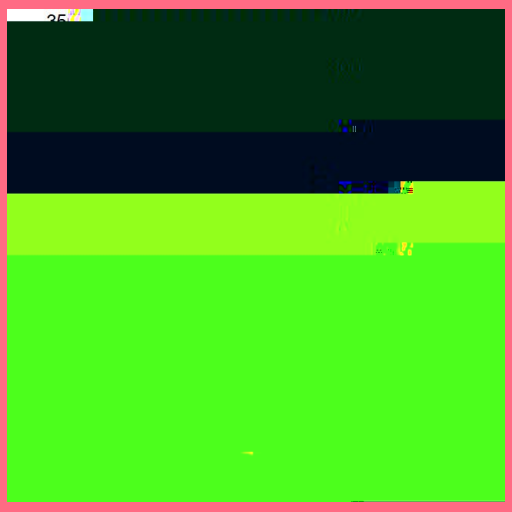


Fig 3. Power dissipation as a function of

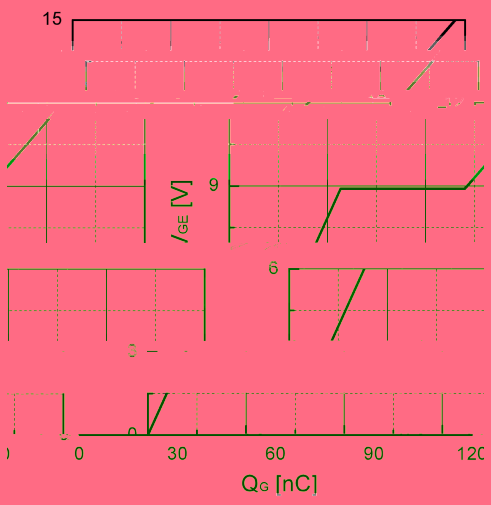


Fig 4. Typical Gate charge

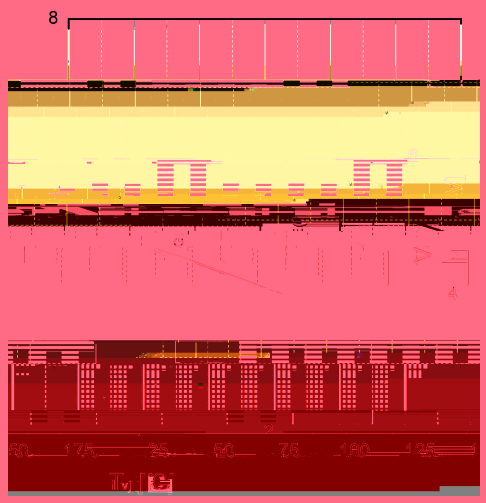
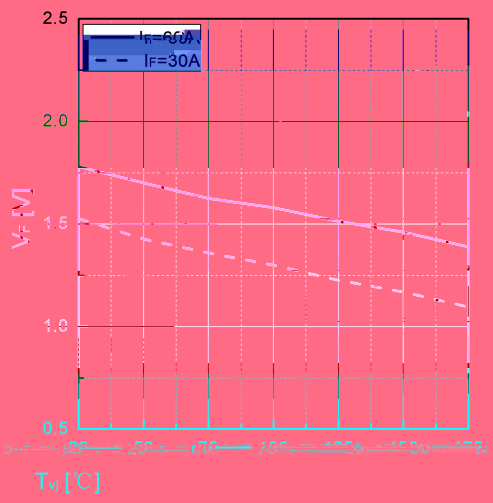


Fig 5. Typical GE(th) as a function of vj (C=1mA)



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Typical performance characteristics

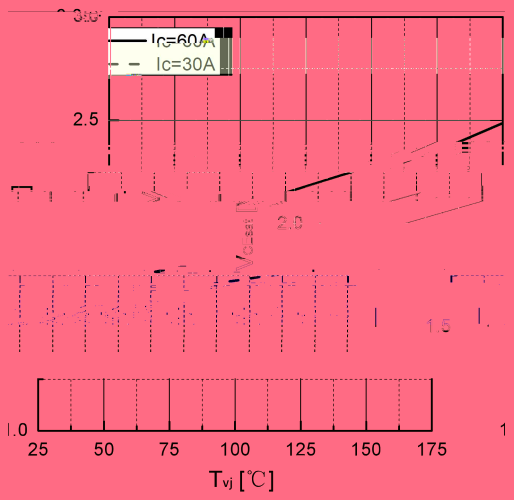


Fig 7. Typical $_{CEsat}$ as a function of $_{vj}$

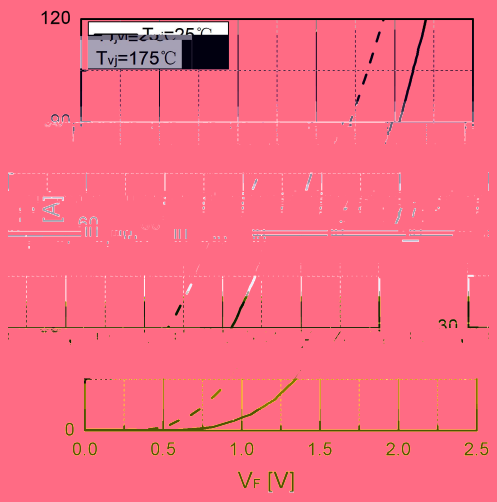


Fig 8. Typical $_{F}$ as a function of $_{F}$

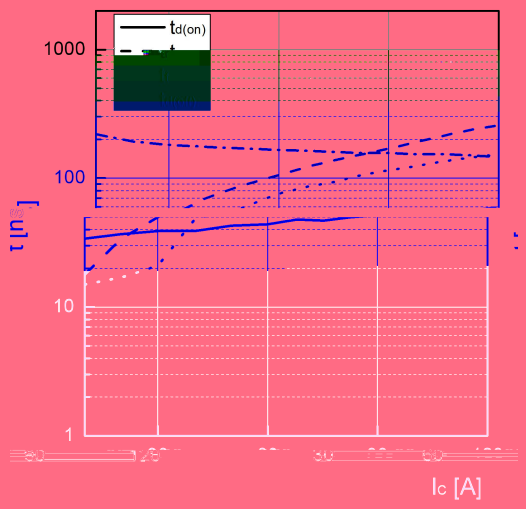


Fig 9. Typical switching time as a function of $_{C}$

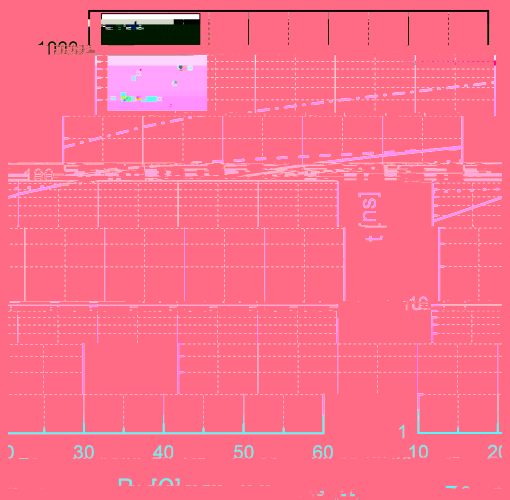


Fig 10. Typical switching times as a function of $_{G}$

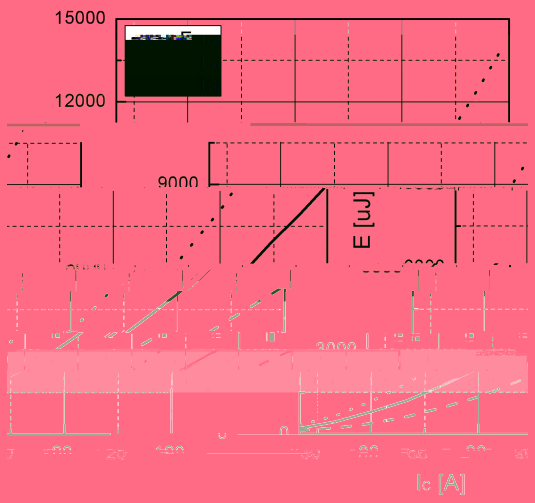


Fig 11. Typical switching energy losses as a function of $_{C}$

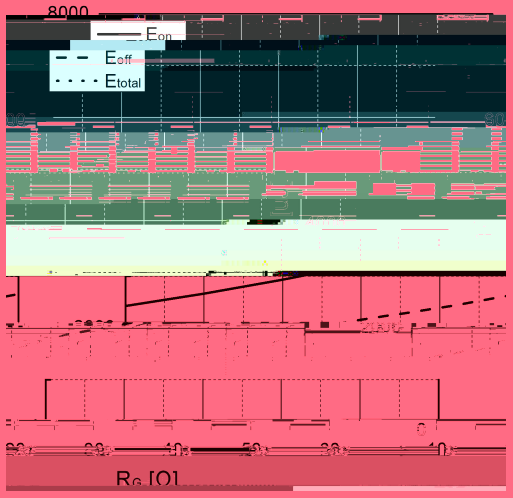


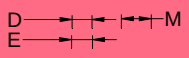
Fig 12. Typical switching energy losses as a function of $_{G}$

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Package dimension

TO-247











Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.50	15.80	16.10	0.610	0.622	0.634
B	20.80	21.00	21.20	0.819	0.827	0.835
C	19.70	20.00	20.30	0.776	0.787	0.799
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.90	2.10	2.30	0.075	0.083	0.091
F	1.00	1.20	1.40	0.039	0.047	0.055
G	5.25	-	5.65	0.207	-	0.222
H	4.80	5.00	5.20	0.189	0.197	0.205
J	1.90	2.00	2.10	0.075	0.079	0.083
K	2.20	2.35	2.50	0.087	0.093	0.098
L	0.41	0.60	0.79	0.016	0.024	0.031
M	2.80	3.00	3.20	0.110	0.118	0.126
N	2.90	3.10	3.30	0.114	0.122	0.130

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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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