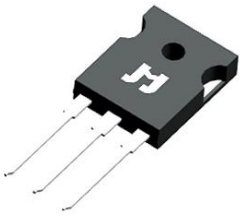
JJMICROELECTRONICS

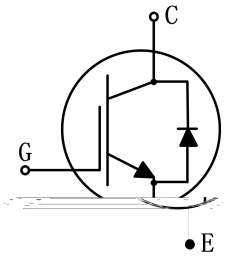
1200V 40A Trench and Field Stop IGBT

JJT40N120UE

- V_{CE} =1200V
- I_C=40A@T_C=100
- $V_{CE(sat)}$=1.9V

TO-247





- Trench and field-stop technology
- High speed switching
- Low collector to emitter saturation voltage
- Easy parallel switching capability
- High ruggedness performance
- RoHS compliant

- Welding machines
- PFC applications

Type	Marking	Package	Packaging Method
JJT40N120UE	T40120UE	TO-247	Tube

V_{CES}	Collector-emitter voltage	1200	V
V_{GES}	Gate-emitter voltage	±20	V
I_C	Continuous collector current (T_C=25)	80	A
	Continuous collector current (T_C=100)	40	A
I_{CM}	Pulsed collector current, t_p limited by T_{vjmax}	160	A
I_F	Diode continuous forward current (T_C=100)	40	A
I_{FM}	Diode maximum current, t_p limited by T_{vjmax}	160	A
P_{tot}	Power dissipation (T_C=25)	395	W
	Power dissipation (T_C=100)	197	W
T_{vj}	Operating junction tempe		

BV_{CES}	Collector-emitter breakdown voltage	V_{GE}=0V, I_C=250μA	1200	-	-	V
I_{CES}	Collec					

$t_{d(on)}$	Turn-on delay time		-	80	-	ns
t_r	Rise time		-	77	-	ns
$t_{d(off)}$	Turn-off delay time	V_{CC}=600V V_{GE}=0/15V I_C=40A	-	308	-	ns
t_f	Fall time	R_G=10Ω Inductive load	-	67	-	ns
E_{on}	Turn-on energy		-	2.1	-	mJ
E_{off}	Turn-off energy		-	1.4	-	mJ
E_{ts}	Total switching energy		-	3.5	-	mJ
$t_{d(on)}$	Turn-on delay time		-	70	-	ns
t_r	Rise time		-	75	-	ns
$t_{d(off)}$	Turn-off Turn-off	V_{CC}=600V V_{GE}=0/15V I_C=40A R_G=10Ω Inductive load T_{vj}=175				

(T_{vj}=25 unless otherwise specified)

V_F	Diode forward voltage	I_F=40A	-	3.1	-	V
		I_F=40A T_{vj}=175	-	2.3	-	V
t_{rr}	Diode reverse recovery time	V_R=600V I_F=40A di_F/dt=-750A/μs	-	170	-	ns
I_{rrm}	Diode peak reverse recovery current		-	17	-	A
Q_{rr}	Diode reverse recovery charge		-	1100	-	nC
t_{rr}	Diode reverse recovery time	V_R=600V I_F=40A di_F/dt=-750A/μs T_{vj}=175	-	285	-	ns
I_{rrm}	Diode peak reverse recovery current		-	28	-	A
Q_{rr}	Diode reverse recovery charge		-	3300	-	nC

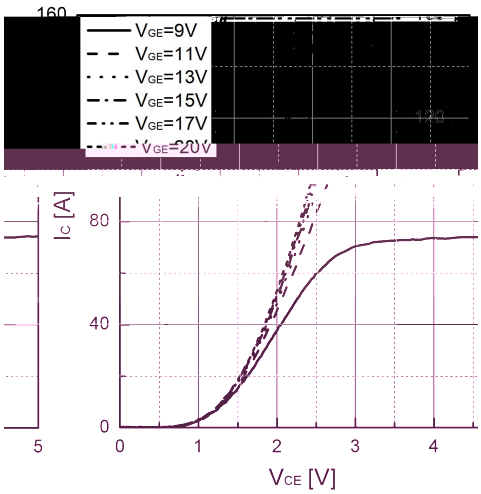


Fig 1. Typical output characteristic (T_{vj}=25)

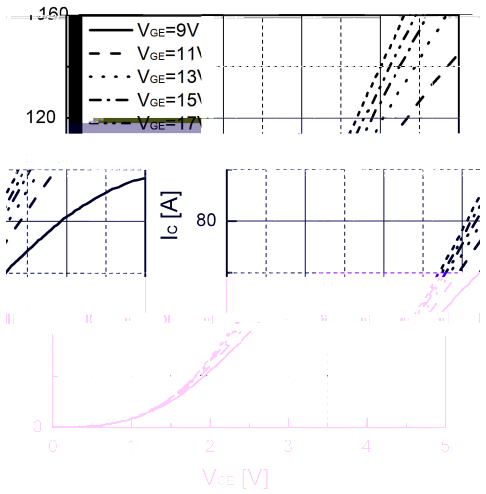


Fig 2. Typical output characteristic(T_{vj}=175)

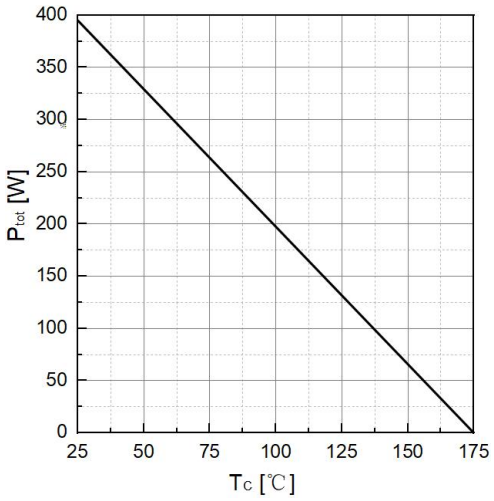


Fig 3. Power dissipation as a function of T_C

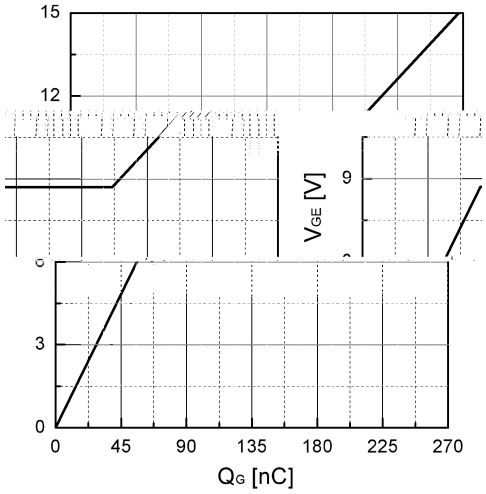


Fig 4. Typical Gate charge

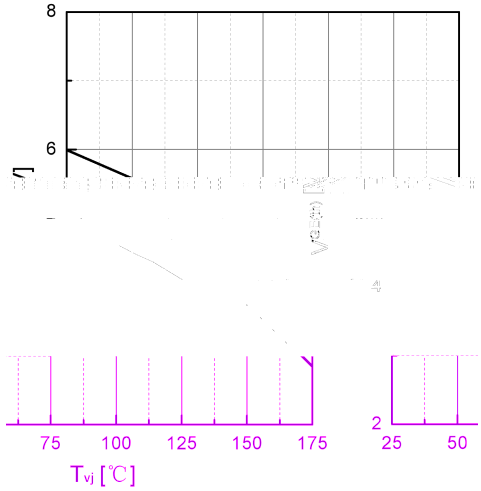


Fig 5. Typical $V_{GE(th)}$ as a function of T_{vj} (I_C=1mA)

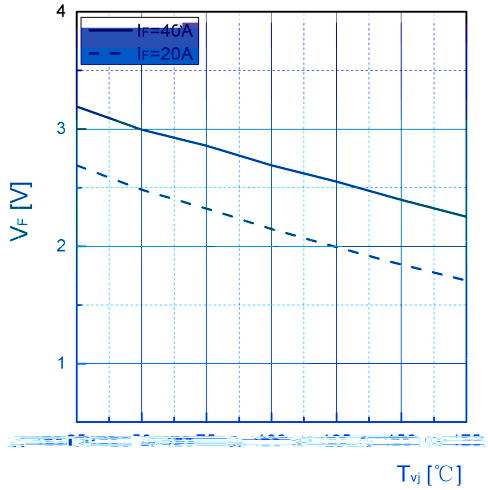


Fig 6. Typical V_F as a function of T_{vj}

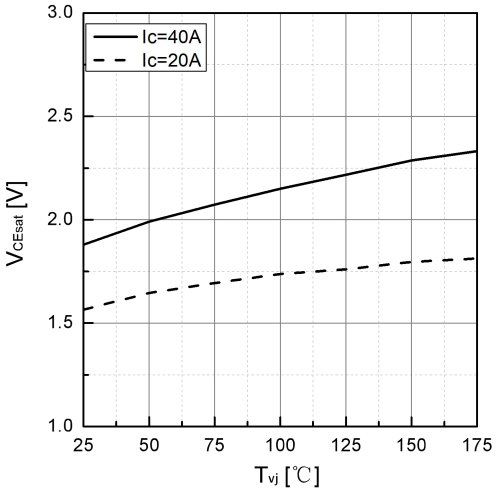


Fig 7. Typical V_{CEsat} as a function of T_{vj}

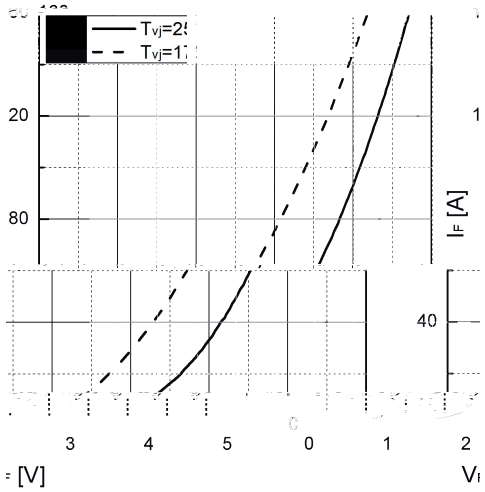


Fig 8. Typical I_F as a function of V_F

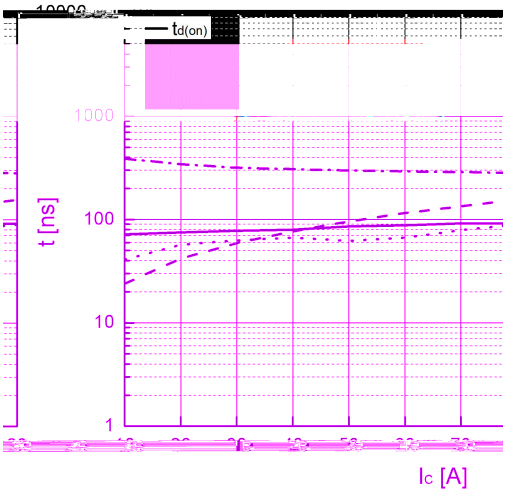


Fig 9. Typical switching time as a function of I_C

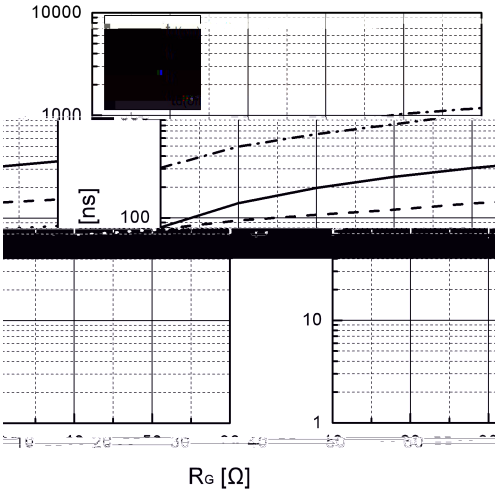


Fig 10. Typical switching times as a function of R_G

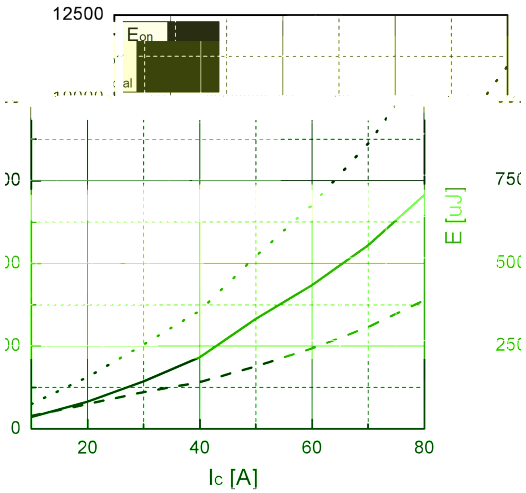


Fig 11. Typical switching energy losses as a function of I_C

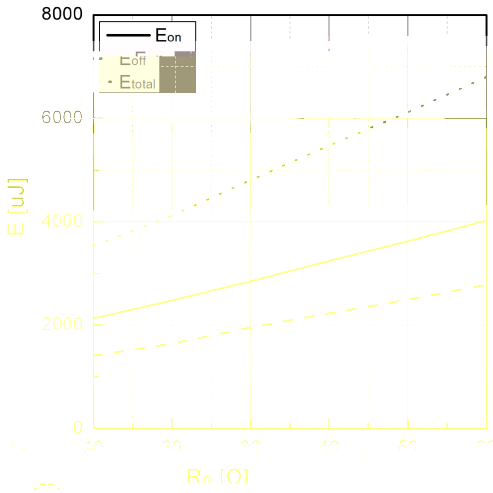


Fig 12. Typical switching energy losses as a function of R_G

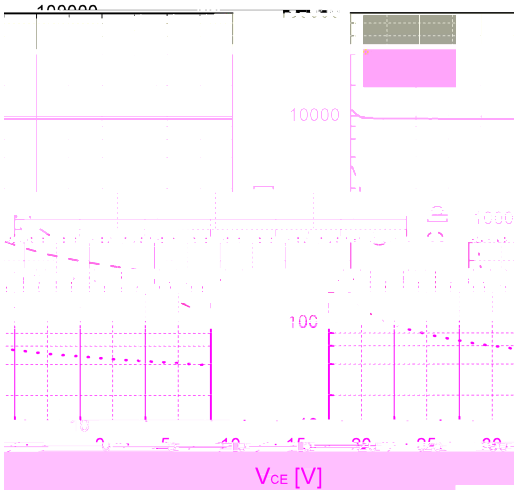


Fig 13. Typical capacitance as a function of V_{CE} (f=1Mhz, V_{GE}=0V)

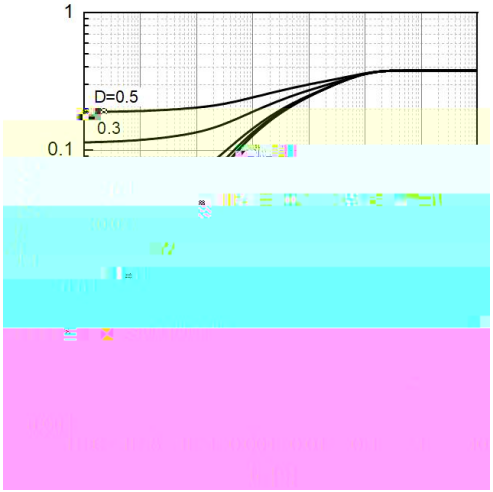


Fig 14. Transient thermal impedance of IGBT

Date	Revision	Changes
2023-12-12	Rev. 1.0	Release of the datasheet.
2024-04-03	Rev. 1.1	Update
2024-05-17	Rev. 1.2	Update
2026-06-25	Rev 1.3	Update thermal

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