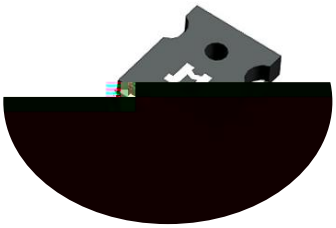
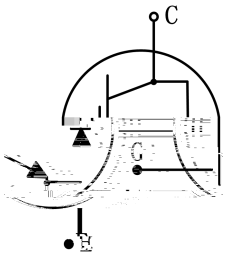
- V_{CE} =1200V
- I_C=40A@ T_C=100
- $V_{CE(sat)}$=1.7V

TO-247





- Trench and field-stop technology
- High speed switching
- Low collector to emitter saturation voltage
- Easy parallel switching capability
- Short circuit withstands time 10μs
- High ruggedness performance
- RoHS compliant

- Inverter
- Motor driver

Type	Marking	Package	Packaging Method
JJT40N120SE	T40120SE	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,		



($_{vj}$=25 unless otherwise specified)

Static characteristics

$_{CES}$	Collector-emitter breakdown voltage	$_{GE}$=0V, I_C=250μA	1200	-	-	V
$_{CES}$	Collector-emitter leakage current	$_{CE}$=1200V, $_{GE}$=0V	-	-	250	μA
$_{GES}$	Gate leakage current, forward	$_{GE}$=20V, $_{CE}$=0V	-	-	100	nA
	Gate leakage current, reverse	$_{GE}$=-20V, $_{CE}$=0V	-	-	-100	nA
$_{GE(th)}$	Gate-emitter threshold voltage	$_{GE}$= $_{CE}$, $_{C}$=1mA	5.0	6.0	7.0	V
$_{CE(sat)}$	Collector-emitter saturation voltage	$_{GE}$=15 V, $_{C}$=40A	-	1.7	-	V
		$_{GE}$=15V, $_{C}$=40A, $_{vj}$=175	-	2.3	-	V

Dynamic characteristics

$_{ies}$	Input capacitance	$_{CE}$=30V $_{GE}$=0V =1MHz	-	3210	-	pF
$_{oes}$	Output capacitance		-	198	-	pF
$_{res}$	Reverse transfer capacitance		-	29	-	pF
$_{g}$	Total gate charge	$_{CC}$=960V =15V =40A	-	191	-	nC

Switching characteristics

$t_{d(on)}$	Turn-on delay time	V_{CC}=600V V_{GE}=0/15V I_C=40A R_G=10 Inductive load	-	42	-	ns
t_r	Rise time		-	101	-	ns
$t_{d(off)}$	Turn-off delay time		-	266	-	ns
t_f	Fall time		-	70	-	ns
E_{on}	Turn-on energy		-	4.0	-	mJ
E_{off}	Turn-off energy		-	1.8	-	mJ
E_{ts}	Total switching energy		-	5.8	-	mJ
$t_{d(on)}$	Turn-on delay time	V_{CC}=600V V_{GE}=0/15V I_C=40A R_G=10 Inductive load T_{vj} =175	-	42	-	ns
t_r	Rise time		-	108	-	ns
$t_{d(off)}$	Turn-off delay time		-	290	-	ns
t_f	Fall time		-	127	-	ns
E_{on}	Turn-on energy		-	6.0	-	mJ
E_{off}	Turn-off energy		-	2.7	-	mJ
E_{ts}	Total switching energy		-	8.7	-	mJ

($_{vj}$=25 unless otherwise specified)

$_{F}$	Diode forward voltage	$_{F}$=40A	-	2.0	-	V
		$_{F}$=40A $_{vj}$=175	-	1.6	-	V
$_{rr}$	Diode reverse recovery time	$_{R}$=600V $_{F}$=40A d $_{F}$/d =-750A/μs	-	175	-	ns
$_{rrm}$	Diode peak reverse recovery current		-	24	-	A
$_{rr}$	Diode reverse recovery charge		-	2000	-	nC
$_{rr}$	Diode reverse recovery time	$_{R}$=600V $_{F}$=40A d $_{F}$/d =-750A/μs $_{vj}$=175	-	285	-	ns
$_{rrm}$	Diode peak reverse recovery current		-	37	-	A
$_{rr}$	Diode reverse recovery charge		-	5500	-	nC

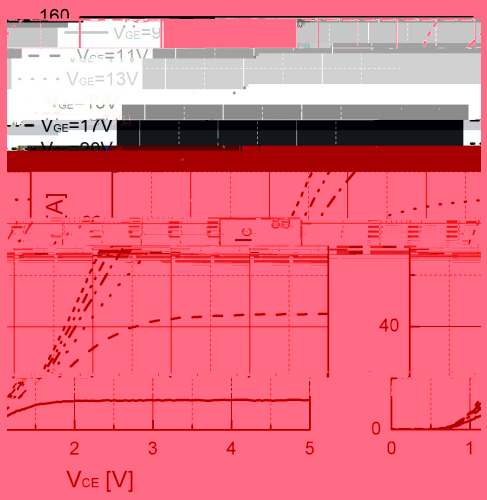


Fig 1. Typical output characteristic (vj=25)

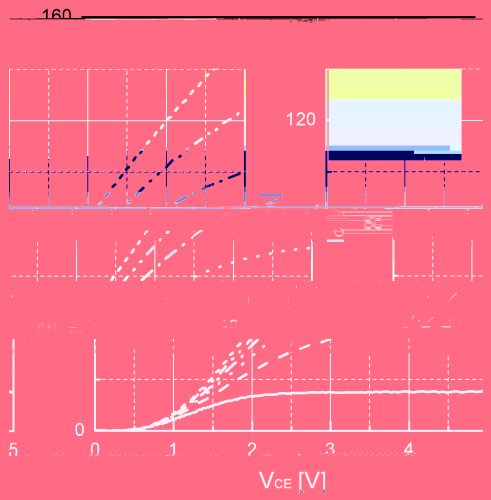


Fig 2. Typical output characteristic(vj=175)

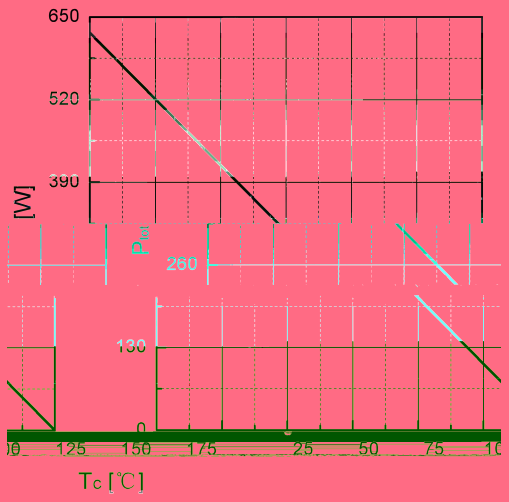


Fig 3. Power dissipation as a function of

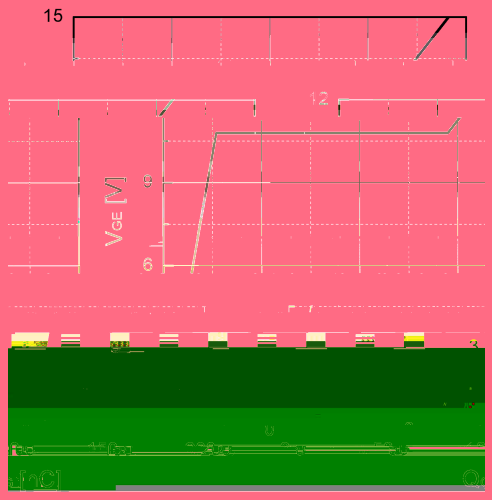


Fig 4. Typical Gate charge

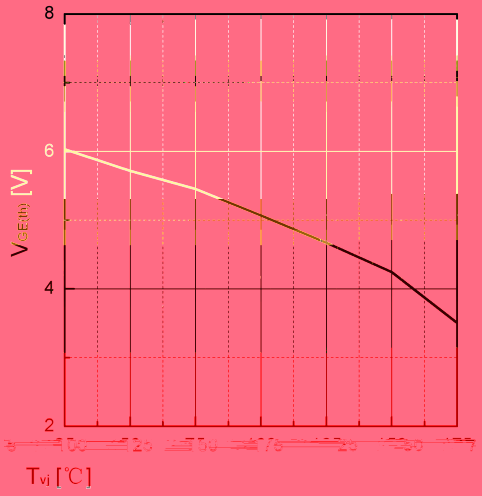


Fig 5. Typical GE(th) as a function of vj (C=1mA)

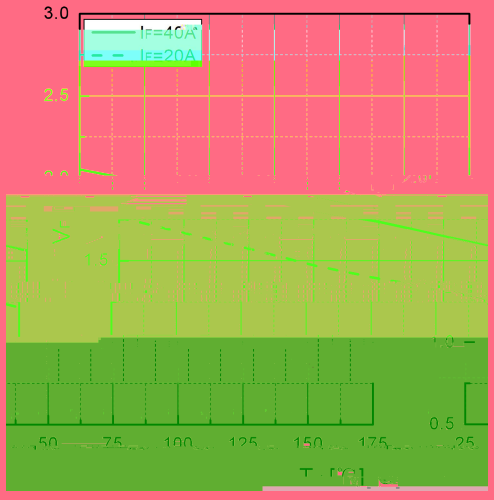


Fig 6. Typical F as function of vj

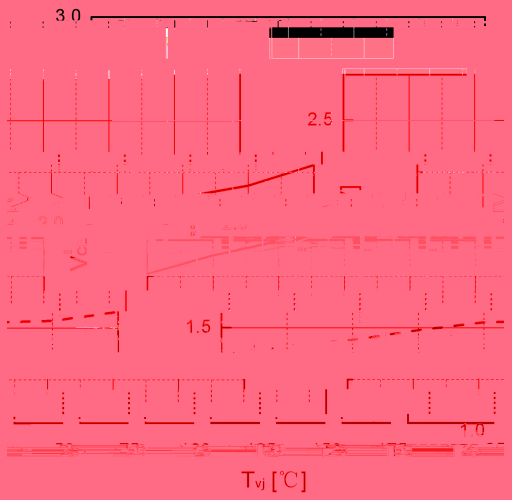


Fig 7. Typical $_{CEsat}$ as a function of $_{vj}$

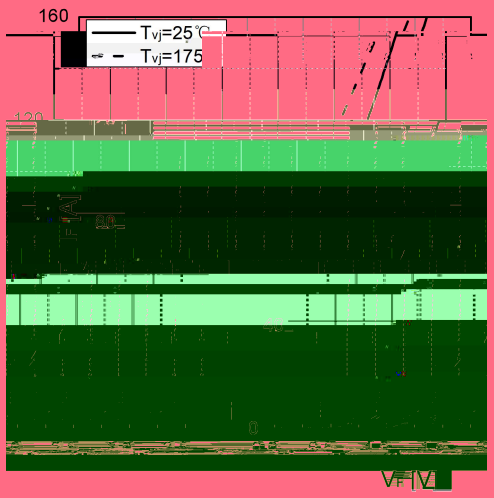


Fig 8. Typical $_{F}$ as a function of $_{F}$

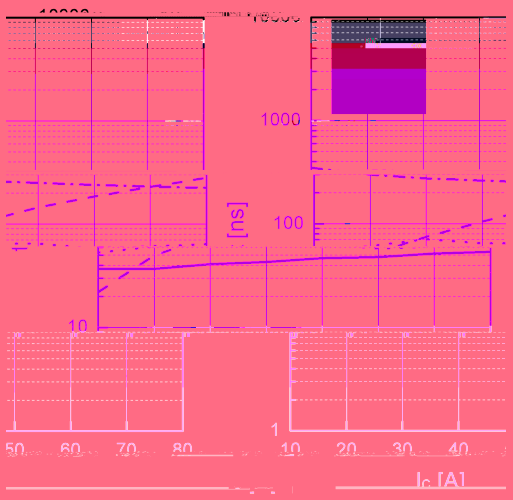


Fig 9. Typical switching time as a function of $_{C}$

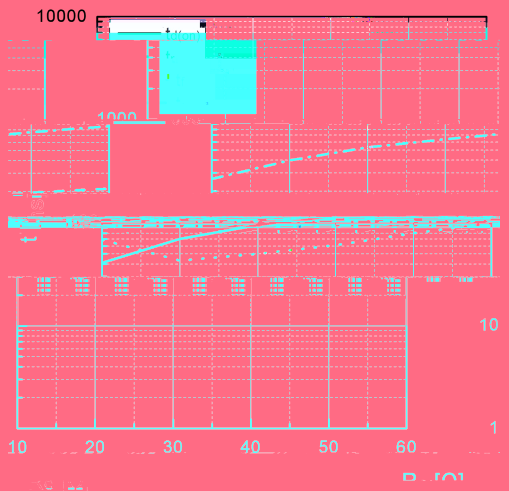


Fig 10. Typical switching times as a function of $_{G}$

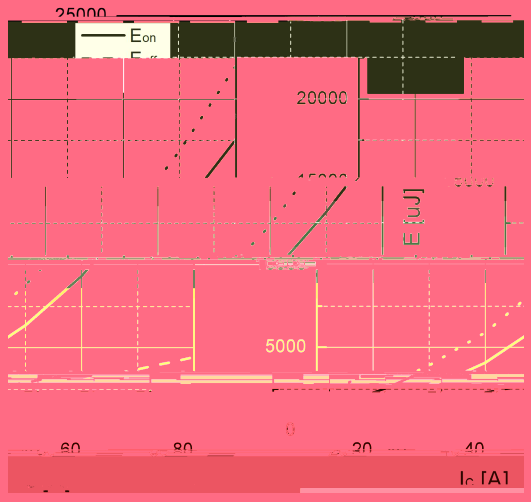


Fig 11. Typical switching energy losses as a function of $_{C}$

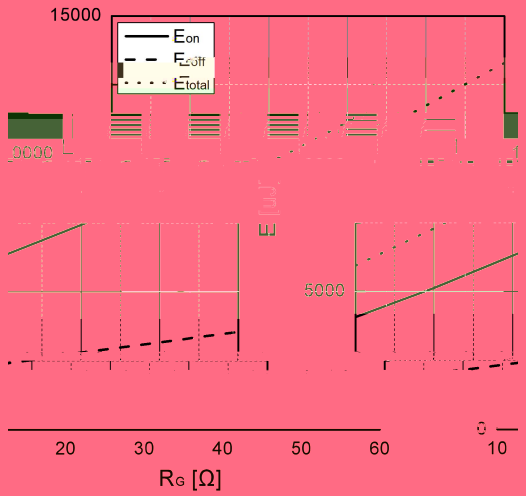


Fig 12. Typical switching energy losses as a function of $_{G}$

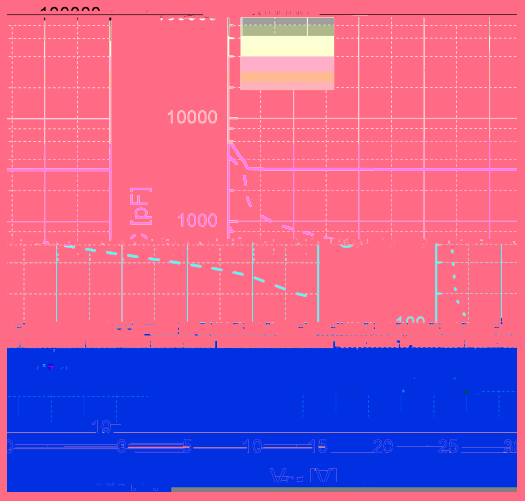


Fig 13. Typical capacitance as a function of $_{CE}$ (f=1Mhz, $_{GE}$=0V)

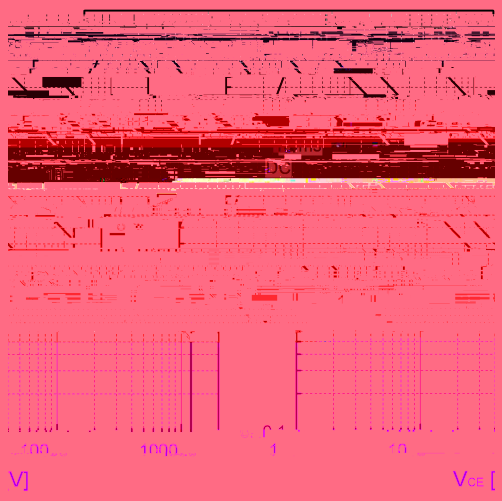


Fig 14. Safe operating area

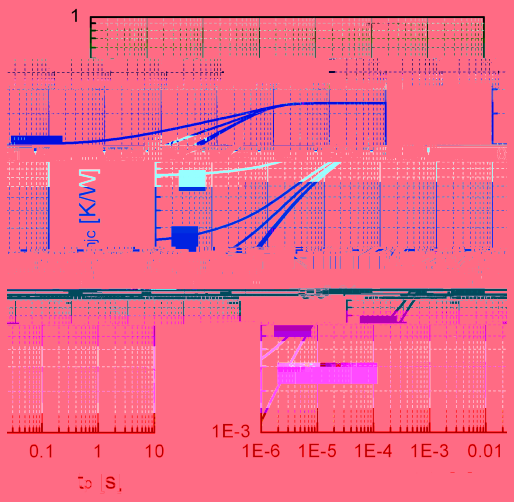
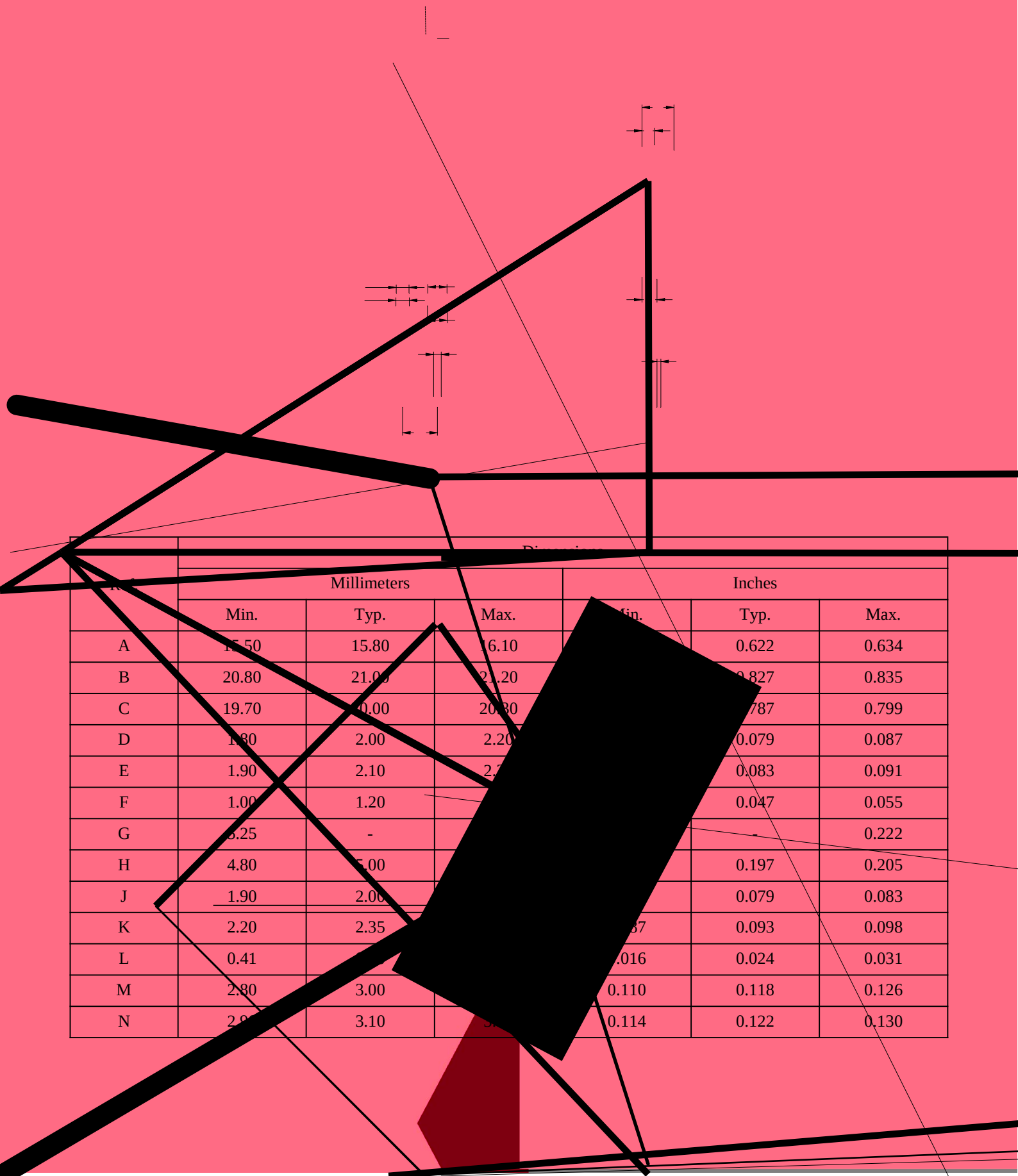


Fig 15. Transient thermal impedance of IGBT

TO-247



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.50	15.80	16.10		0.622	0.634
B	20.80	21.00	21.20		0.827	0.835
C	19.70	20.00	20.30		0.787	0.799
D	1.80	2.00	2.20		0.079	0.087
E	1.90	2.10	2.3		0.083	0.091
F	1.00	1.20			0.047	0.055
G	5.25	-			-	0.222
H	4.80	5.00			0.197	0.205
J	1.90	2.00			0.079	0.083
K	2.20	2.35		87	0.093	0.098
L	0.41			.016	0.024	0.031
M	2.80	3.00		0.110	0.118	0.126
N	2.9	3.10	3	0.114	0.122	0.130

Date	Revision	Changes
2024-04-03	Rev. 1.0	Release of the datasheet
2024-05-17	Rev. 1.1	Update

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