

Prospective data

## Insulated Gate Bi-Polar Transistor Type T1500TA25E

### Absolute Maximum Ratings

	VOLTAGE RATINGS	MAXIMUM LIMITS	UNITS
$V_{CES}$	Collector – emitter voltage	2500	V
$V_{DC\ link}$	Permanent DC voltage for 100 FIT failure rate.	1250	V
$V_{GES}$	Peak gate – emitter voltage	$\pm 20$	V

	RATINGS	MAXIMUM LIMITS	UNITS
$I_{C(DC)}$	Continuous DC collector current, IGBT (Note 2).	2067	A
$I_{CRM}$	Repetitive peak collector current, $t_p=1ms$ , IGBT.	3	kA
$I_{ECO}$	Maximum reverse emitter current, $t_p=1ms$ (note 4).	1500	A
$P_{MAX}$	Maximum power dissipation, IGBT (note 3).	7.5	kW
$T_{j\ op}$	Operating temperature range.	-40 to +125	$^{\circ}C$
$T_{stg}$	Storage temperature range.	-40 to +125	$^{\circ}C$

Notes: -

- 1) Unless otherwise indicated  $T_j = 125^{\circ}C$ .
- 2)  $T_{sink} = 55^{\circ}C$ , double side cooled.
- 3)  $T_{sink} = 25^{\circ}C$ , double side cooled.
- 4) The use of an anti-parallel diode is recommended.

**Characteristics**

IGBT Characteristics

	PARAMETER	MIN	TYP	MAX	TEST CONDITIONS	UNITS
V <sub>CE(sat)</sub>	Collector – emitter saturation voltage	-	2.5	2.9	I <sub>C</sub> = 1500A, V <sub>GE</sub> = 15V, T <sub>J</sub> = 25°C	V
		-	3.0	3.4	I <sub>C</sub> = 1500A, V <sub>GE</sub> = 15V	V
V <sub>T0</sub>	Threshold voltage	-	-	1.8	Current range: 700A – 2000A	V
r <sub>T</sub>	Slope resistance	-	-	0.37		mΩ
V <sub>GE(TH)</sub>	Gate threshold voltage	6	-	9	V <sub>CE</sub> = V <sub>GE</sub> , I <sub>C</sub> = 200mA	V
I <sub>CES</sub>	Collector – emitter cut-off current	-	4	25	V <sub>CE</sub> = V <sub>CES</sub> , V <sub>GE</sub> = 0V	mA
I <sub>GES</sub>	Gate leakage current	-	-	±200	V <sub>GE</sub> = ±20V	μA
C <sub>ies</sub>	Input capacitance	-	200	-	V <sub>CE</sub> = 25V, V <sub>GE</sub> = 0V, f = 1MHz	nF
t <sub>d(on)</sub>	Turn-on delay time	-	2.1	-	I <sub>C</sub> = 1500A, V <sub>CE</sub> = 0.5V <sub>CES</sub> , V <sub>GE</sub> = ±20V, R <sub>g(on)</sub> = 4Ω, R <sub>g(off)</sub> = 8Ω, Snubber : 10Ω and 0.5μF in series	μs
t <sub>r(l)</sub>	Rise time	-	2.8	-		μs
Q <sub>g(on)</sub>	Turn-on gate charge	-	-	29		μC
E <sub>on</sub>	Turn-on energy	-	3.3	-		J
t <sub>d(off)</sub>	Turn-off delay time	-	2.4	-		μs
t <sub>f</sub>	Fall time	-	1.5	-		μs
Q <sub>g(off)</sub>	Turn-off gate charge	-	-	65		μC
E <sub>off</sub>	Turn-off energy	-	1.7	-		J

Other Characteristics

	PARAMETER	MIN	TYP	MAX	TEST CONDITIONS	UNITS
R <sub>thJK</sub>	Thermal resistance junction to sink	-	-	13.2	Double side cooled	K/kW
		-	-	23.1	Collector side cooled	K/kW
		-	-	31.8	Emitter side cooled	K/kW
F	Mounting force	20	-	30		kN
W <sub>t</sub>	Weight	-	1.2	-		kg

Notes:-

- 1) Unless otherwise indicated T<sub>J</sub> = 125°C.

**Curves**

Figure 1 – Typical collector-emitter saturation voltage characteristics

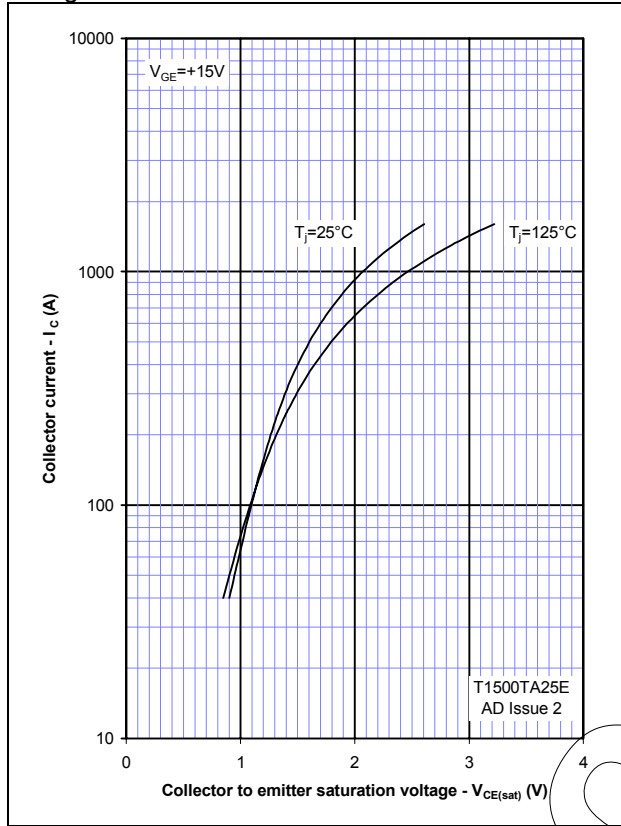


Figure 2 – Typical output characteristic at 25°C

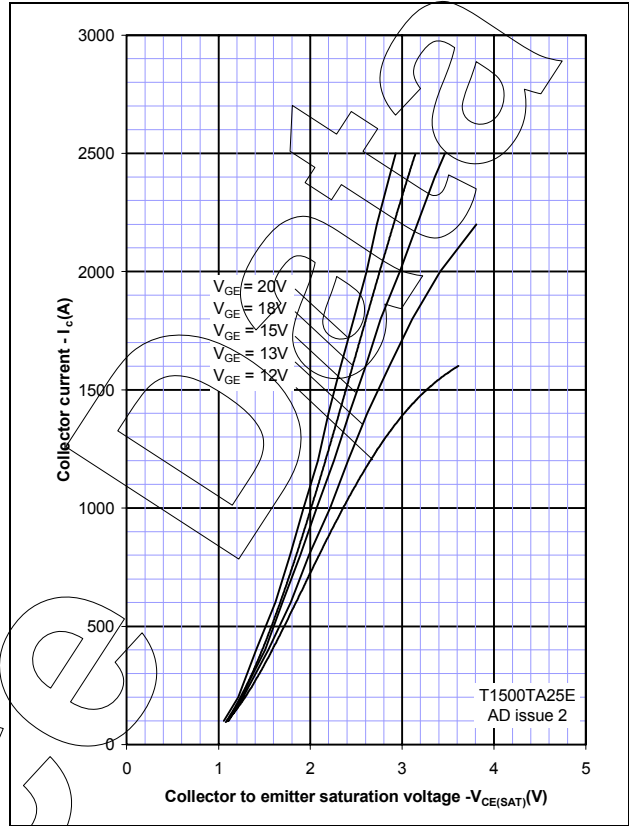


Figure 3 – Typical output characteristic at 125°C

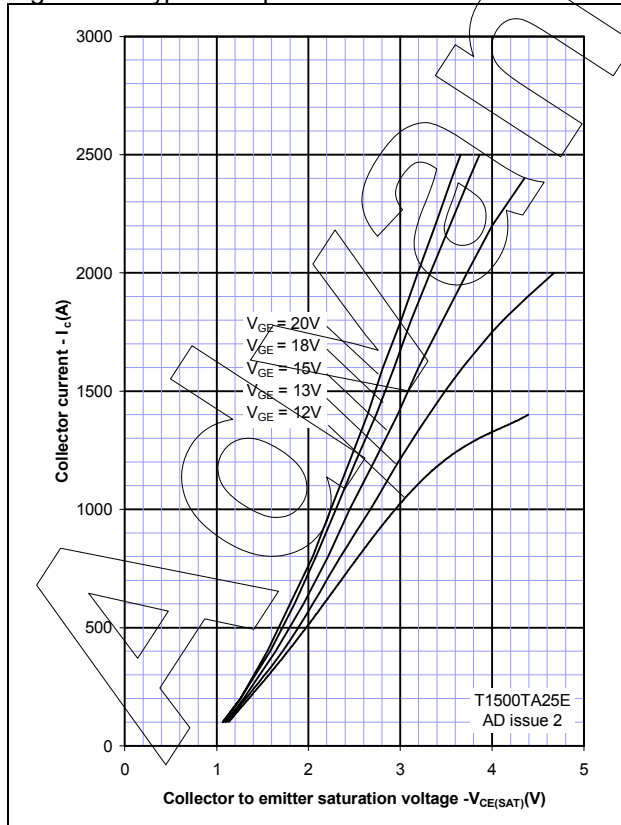


Figure 4 – Typical turn-on gate charge

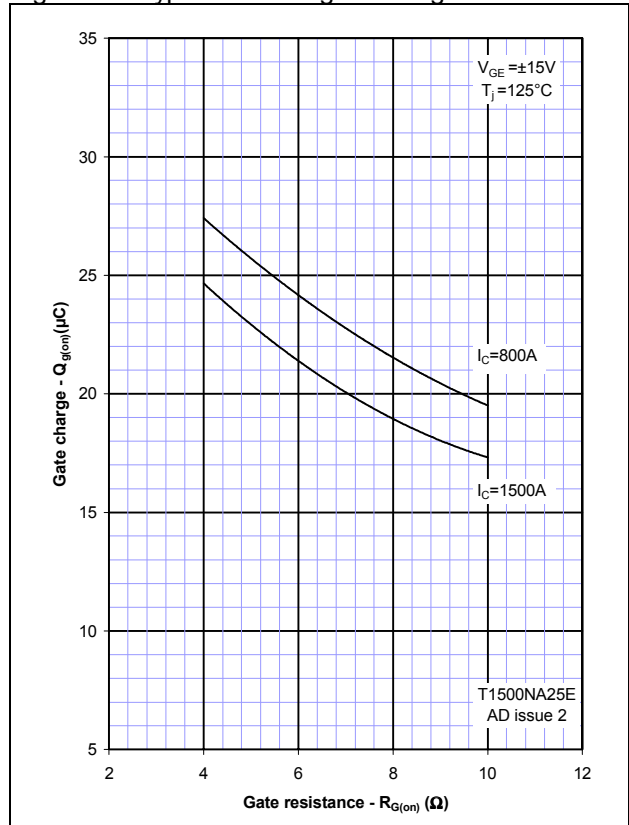


Figure 5 – Typical turn-off gate charge

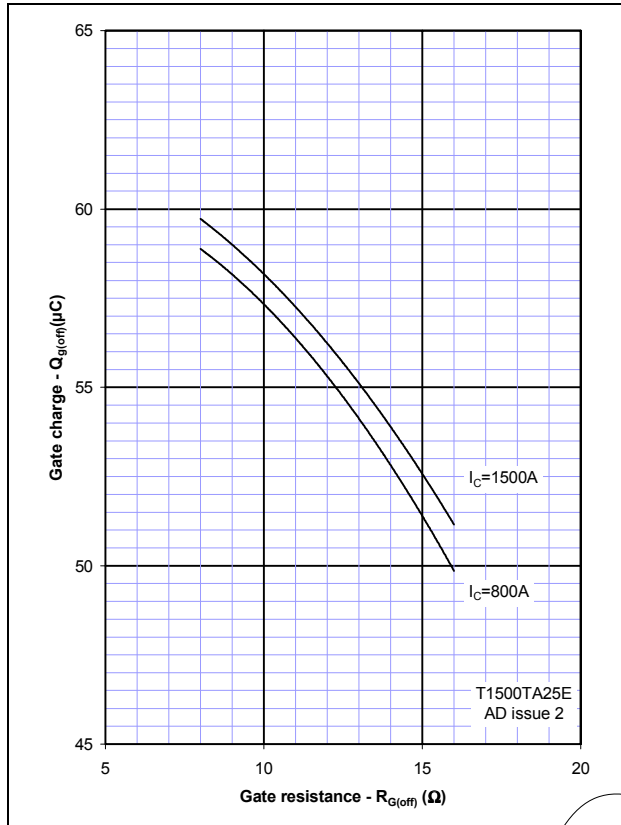


Figure 6 – Typical turn-on delay time vs gate resistance

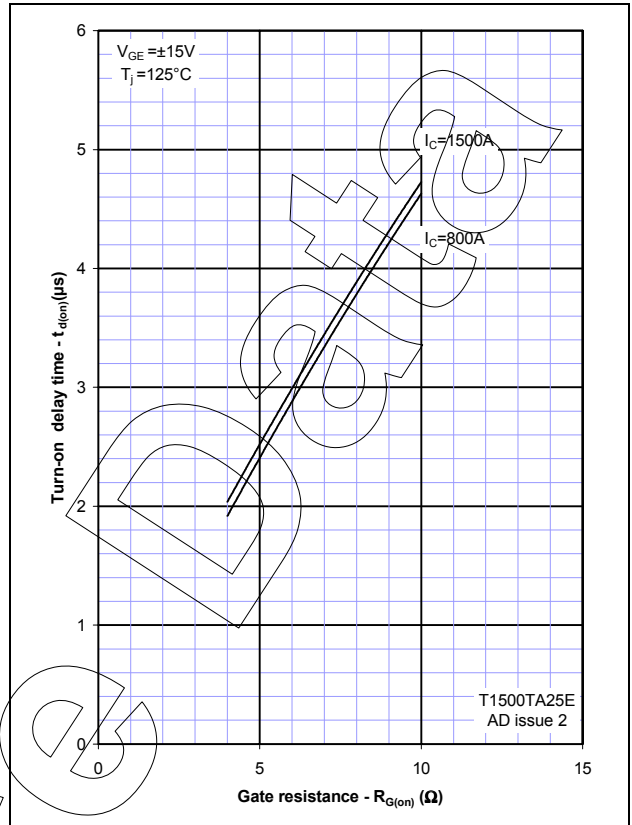


Figure 7 – Typical turn-off delay time vs gate resistance

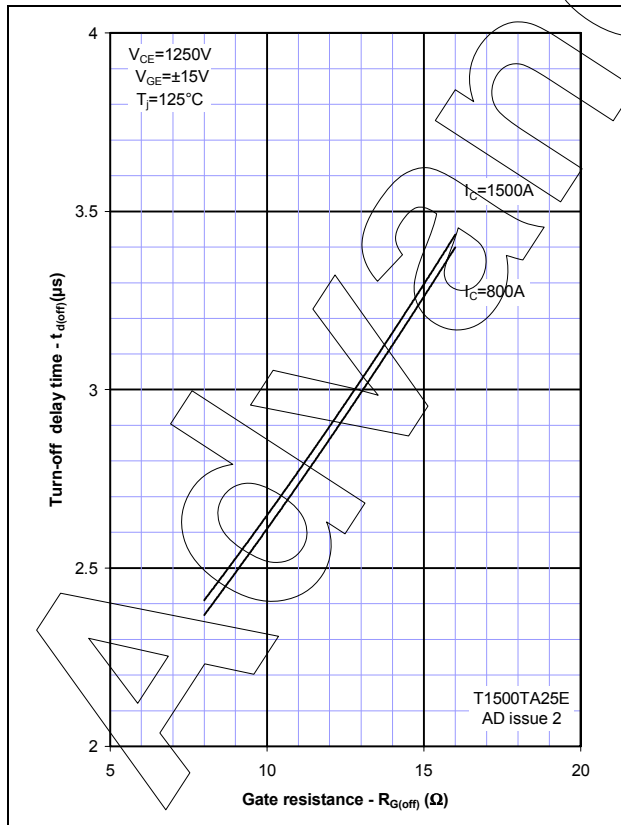


Figure 8 – Typical turn-on energy vs. collector current

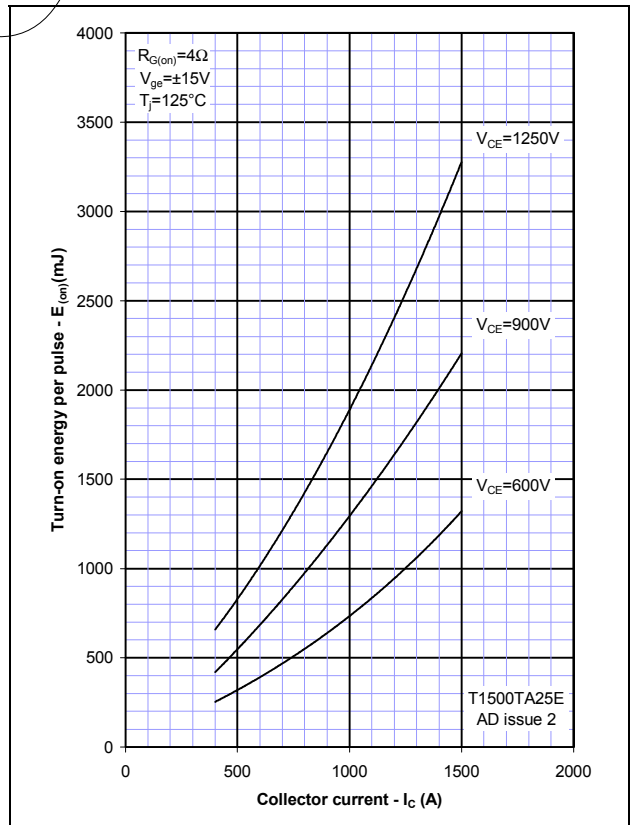


Figure 9 – Typical turn-on energy vs. di/dt

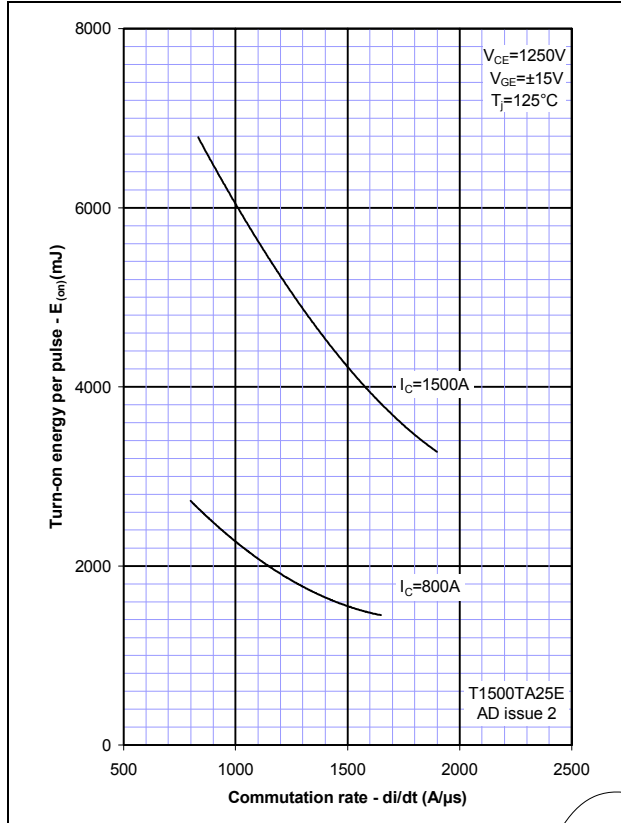


Figure 10 – Typical turn-off energy vs. collector current

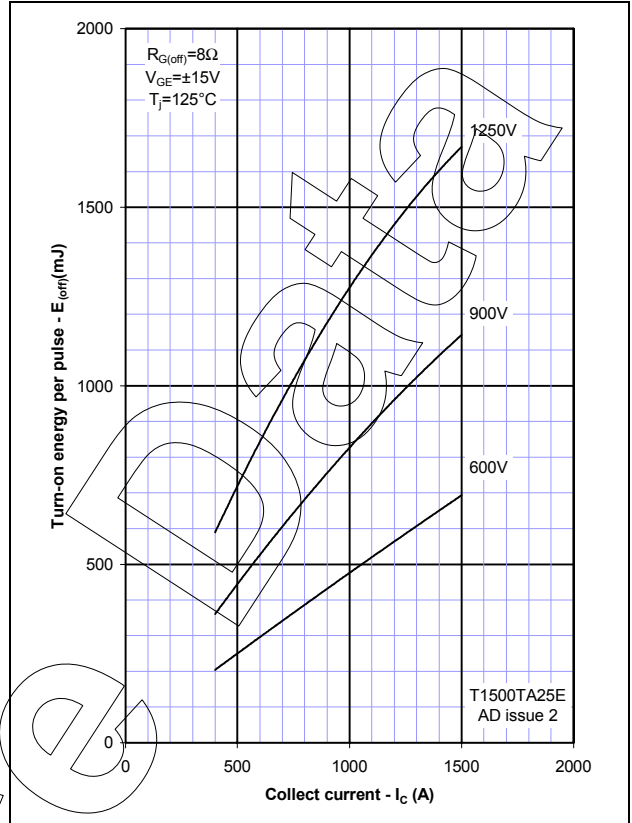


Figure 11 – Turn-off energy vs. voltage

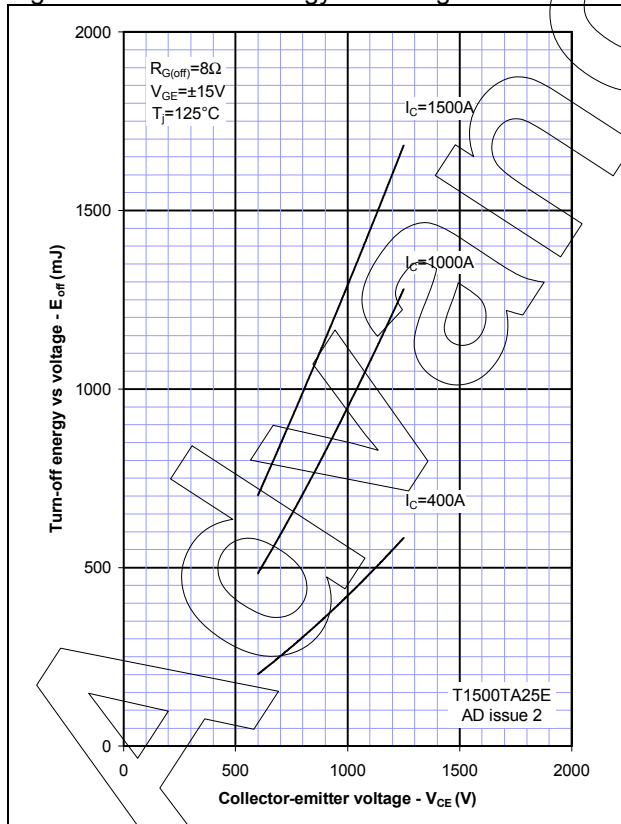


Figure 12 – Safe operating area

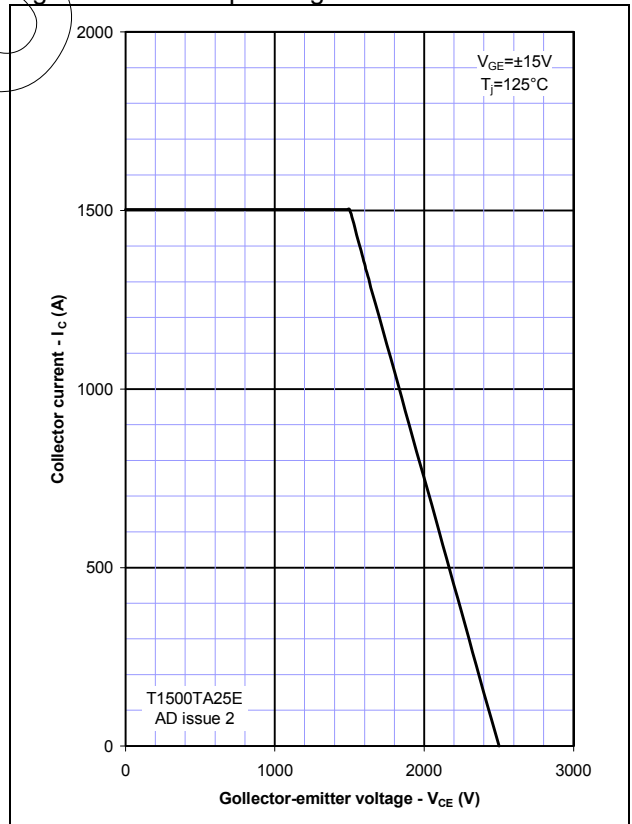
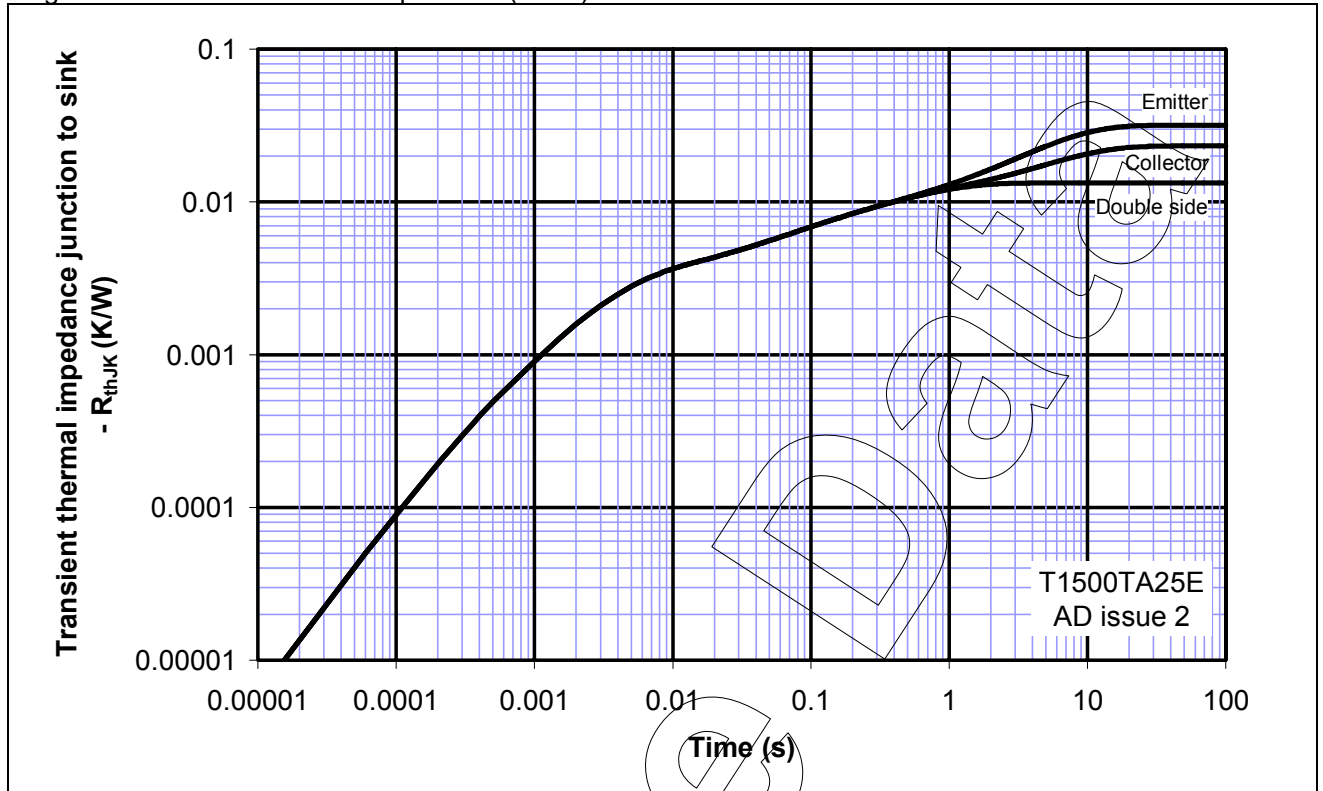
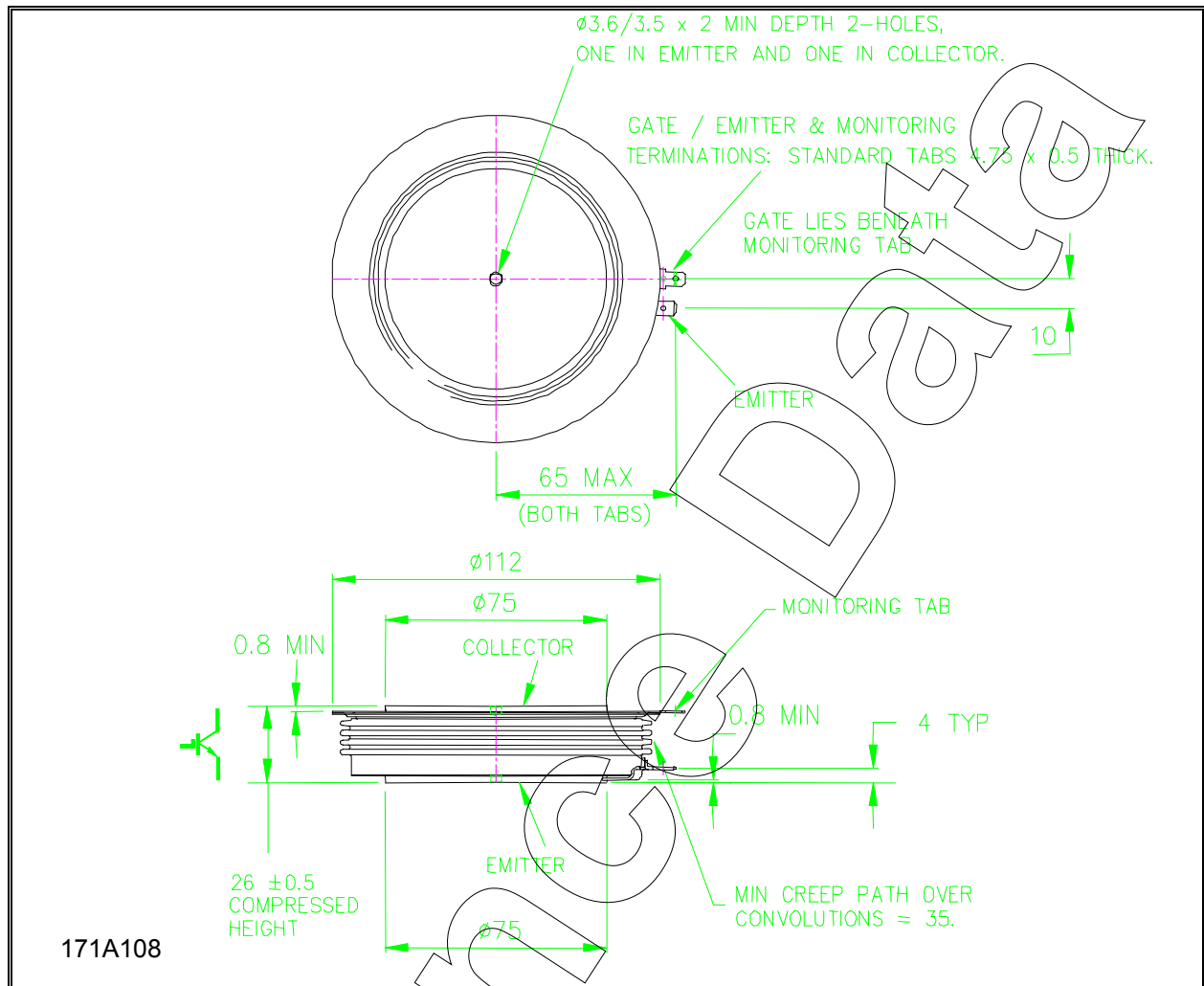


Figure 13– Transient thermal impedance (IGBT)



**Outline Drawing & Ordering Information**



ORDERING INFORMATION			
<b>T1500</b> Fixed Type code	<b>TA</b> Fixed Outline Code	<b>25</b> Voltage Grade 2500V	<b>E</b> Fixed code

(Please quote 10 digit code as below)

Typical order code: T1500TA25E (V<sub>CES</sub> = 2500V)

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