

Provisional data

Insulated Gate Bi-Polar Transistor Type T0500NA25E

(Development Type Number: TX044NA25E)

Absolute Maximum Ratings

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

	RATINGS	MAXIMUM LIMITS	UNITS
$I_{C(DC)}$	Continuous DC collector current, IGBT (Note 2).	605	A
I_{CRM}	Repetitive peak collector current, $t_p=1ms$, IGBT.	1000	A
I_{ECO}	Maximum reverse emitter current, $t_p=1ms$ (note 4).	500	A
P_{MAX}	Maximum power dissipation, IGBT (note 3).	2.6	kW
T_j	Operating temperature range.	-40 to +125	°C
T_{stg}	Storage temperature range.	-40 to +125	°C

Notes: -

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

Characteristics

IGBT Characteristics

	PARAMETER	MIN	TYP	MAX	TEST CONDITIONS	UNITS
V _{CE(sat)}	Collector – emitter saturation voltage	-	2.4	2.7	I _C = 500A, V _{GE} = 15V, T _j = 25°C	V
		-	2.75	3.3	I _C = 500A, V _{GE} = 15V	V
V _{To}	Threshold voltage	-	-	1.57	Current range: 300 – 650A	V
r _T	Slope resistance	-	-	2.35		mΩ
V _{ECO}	Reverse avalanche voltage	-	22	-	I _{ECO} = 200A	V
V _{GE(TH)}	Gate threshold voltage	6	7.5	9	V _{CE} = V _{GE} , I _C = 200mA	V
I _{CES}	Collector – emitter cut-off current	-	2	7	V _{CE} = V _{CES} , V _{GE} = 0V	mA
I _{GES}	Gate leakage current	-	-	±3.5	V _{GE} = ±20V	μA
C _{ies}	Input capacitance	-	82	-	V _{CE} = 25V, V _{GE} = 0V, f = 1MHz	nF
t _{d(on)}	Turn-on delay time	-	2.3	-	I _C = 500A, V _{CE} = 0.5V _{CES} , V _{GE} = ±20V, R _{g(ON)} = 20Ω, R _{g(OFF)} = 15Ω, Snubber : 10Ω and 0.22μF in series	μs
t _{r(l)}	Rise time	-	2.0	-		μs
Q _{g(on)}	Turn-on gate charge	-	-	15		μC
E _{on}	Turn-on energy	-	0.8	-		J
t _{d(off)}	Turn-off delay time	-	1.6	-		μs
t _f	Fall time	-	2.5	-		μs
Q _{g(off)}	Turn-off gate charge	-	-	38		μC
E _{off}	Turn-off energy	-	0.5	-		J

Thermal Characteristics

	PARAMETER	MIN	TYP	MAX	TEST CONDITIONS	UNITS
R _{th(j-hs)}	Thermal impedance junction to sink, IGBT	-	-	38.6	Double side cooled	K/kW
		-	-	58.6	Collector side cooled	K/kW
		-	-	112	Emitter side cooled	K/kW
F	Mounting force	8	-	12		kN
W _t	Weight	-	0.5	-		kg

Notes:-

- 1) Unless otherwise indicated T_j = 125°C.

Curves

Figure 1 – Typical and maximum collector-emitter saturation voltage characteristics

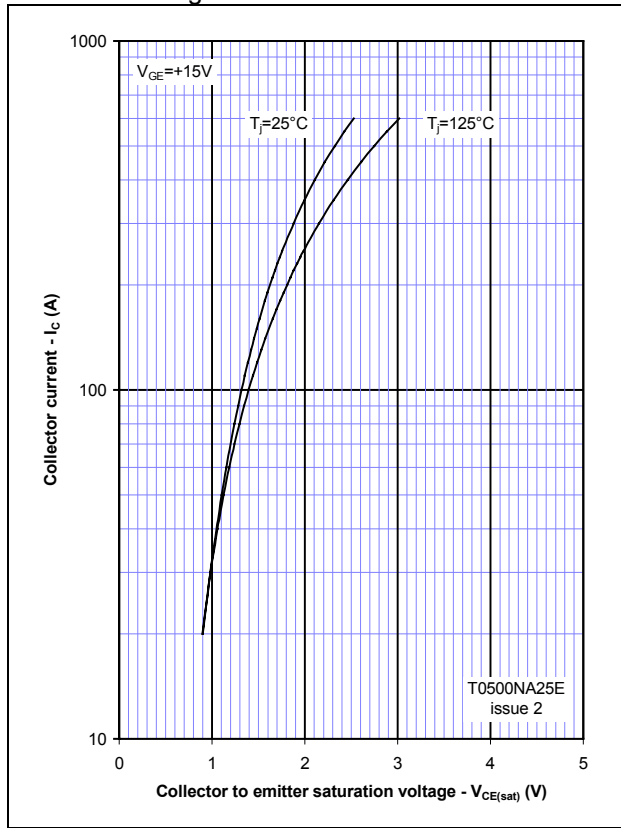


Figure 2 – Typical output characteristic at 25°C

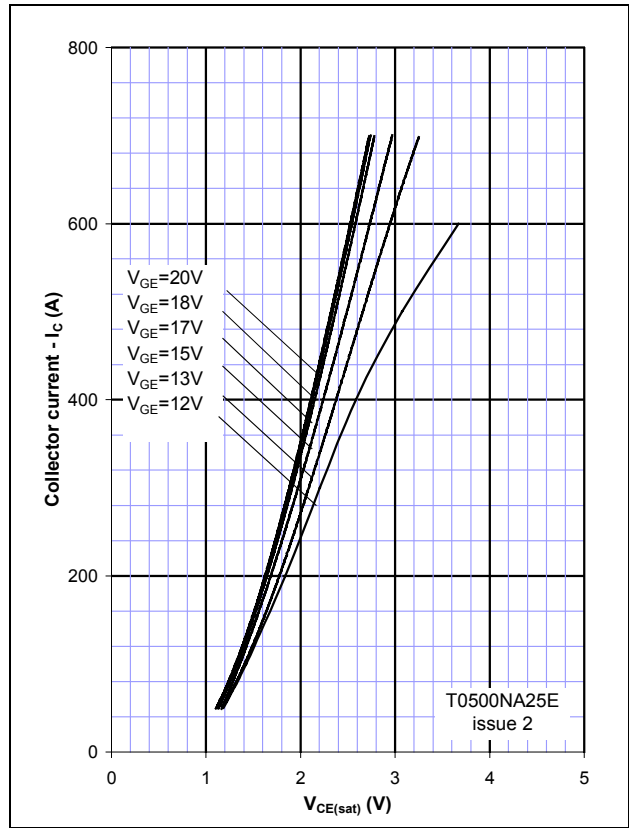


Figure 3 – Typical output characteristic at 125°C

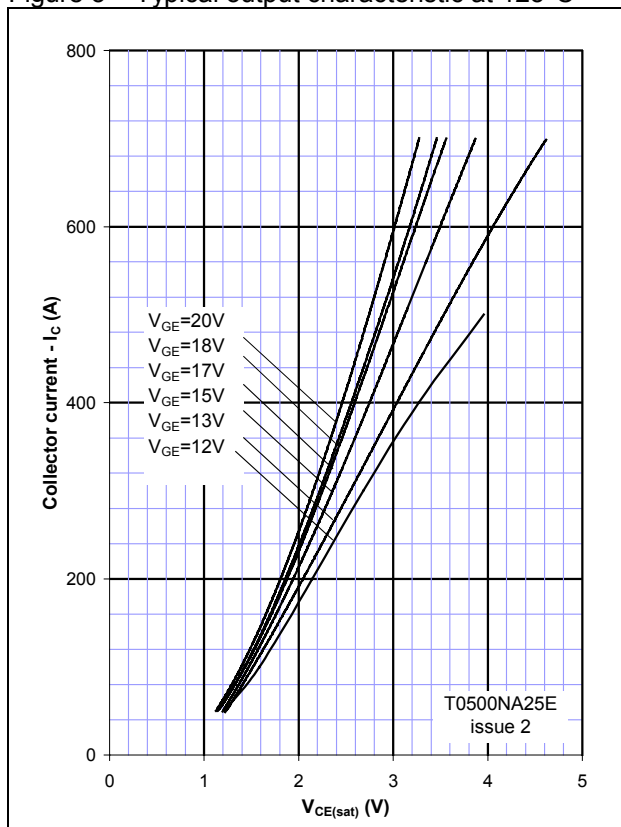


Figure 4 – Typical turn-on gate charge

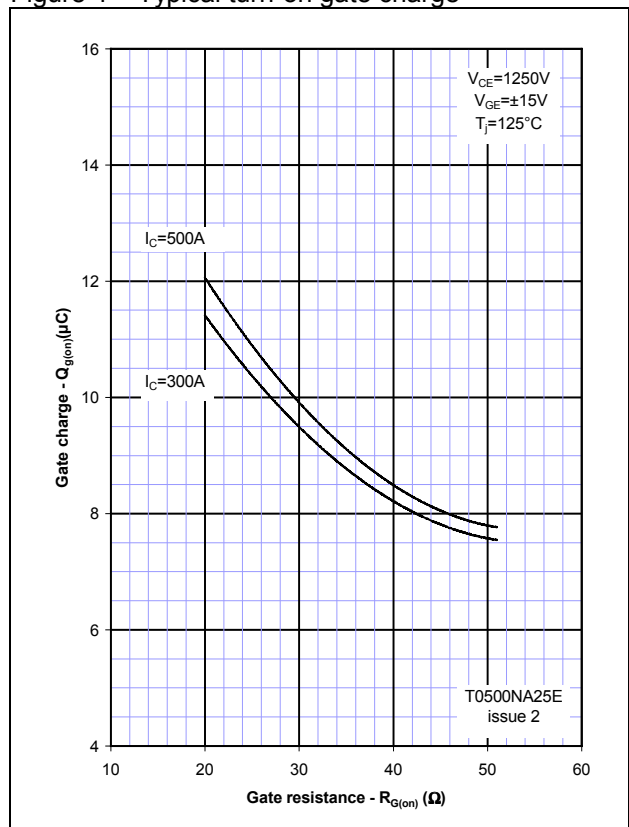


Figure 5 – Typical turn-off gate charge

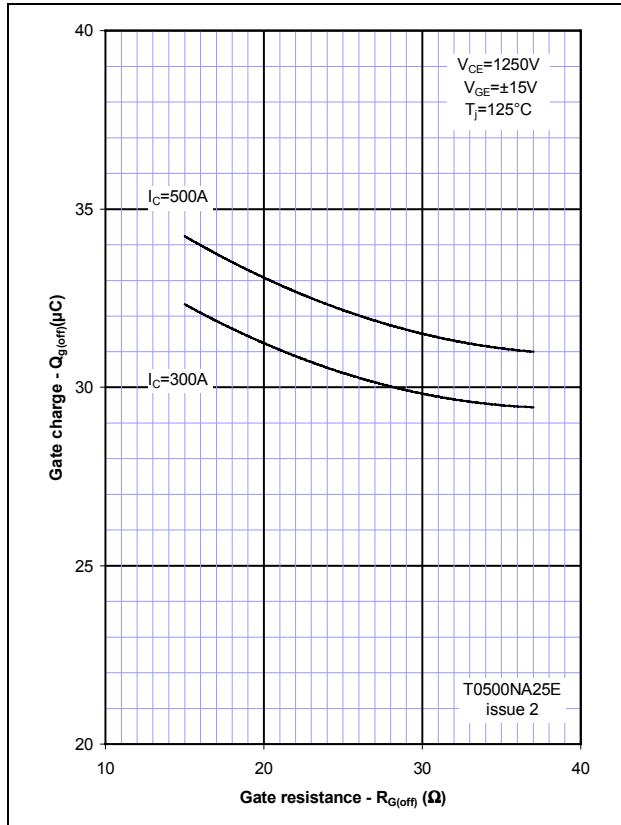


Figure 6 – Typical turn-on delay time vs gate resistance

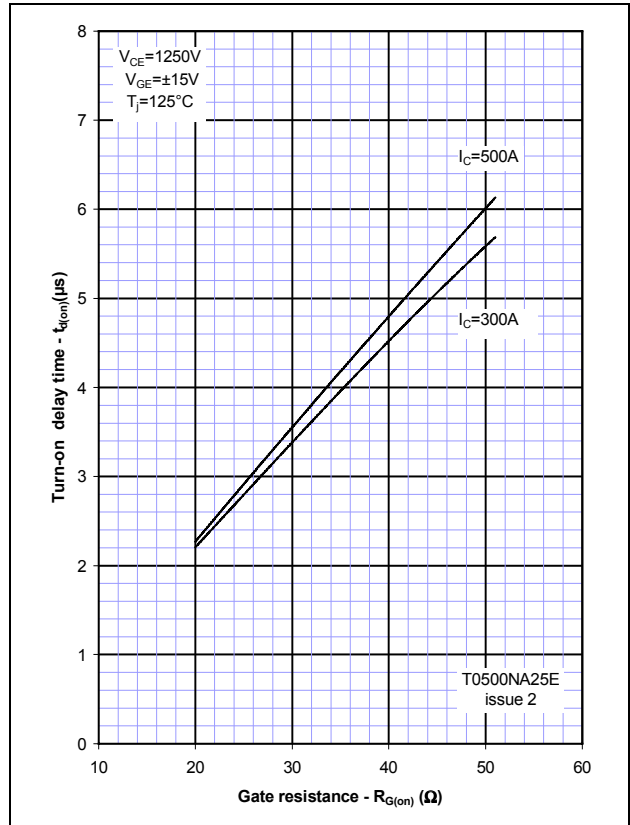


Figure 7 – Typical turn-off delay time vs. gate resistance

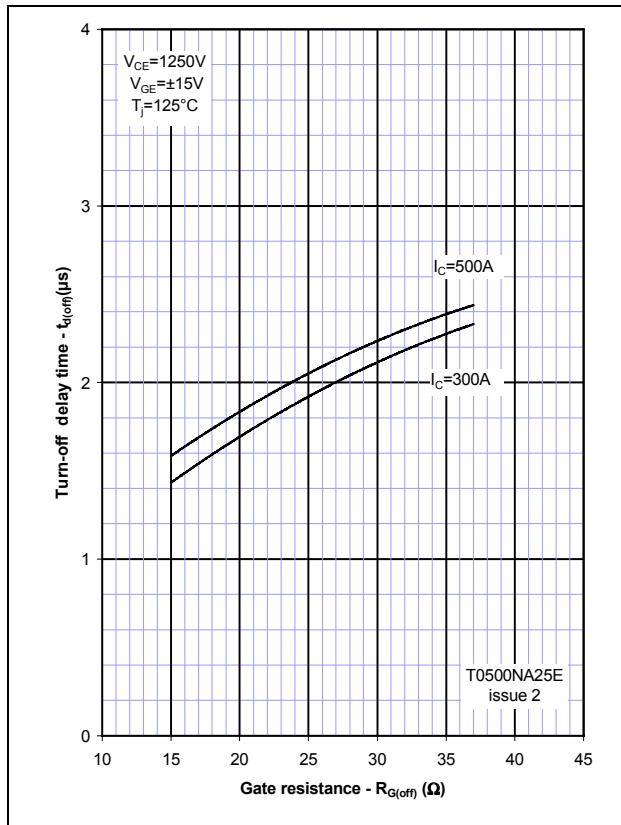


Figure 8 – Typical turn-on energy vs. collector current

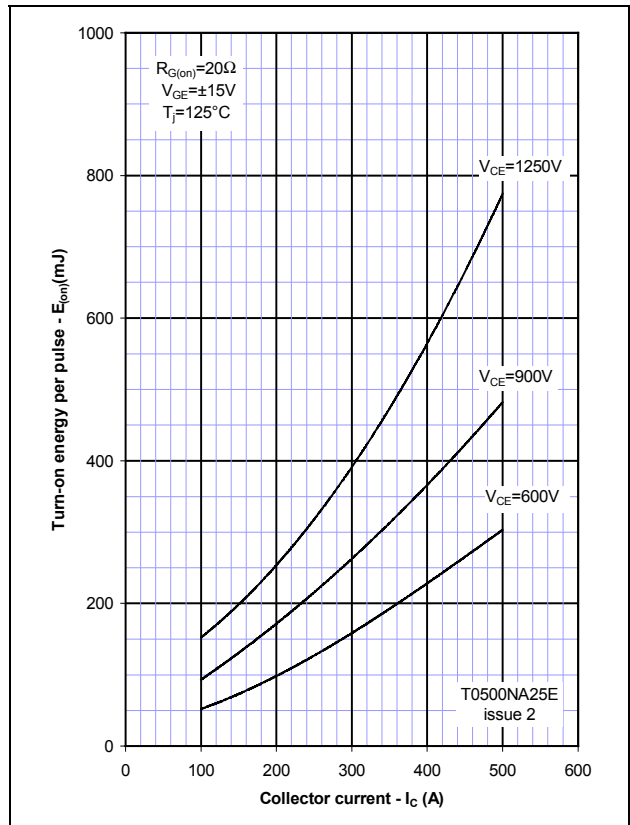


Figure 9 – Typical turn-on energy vs. di/dt

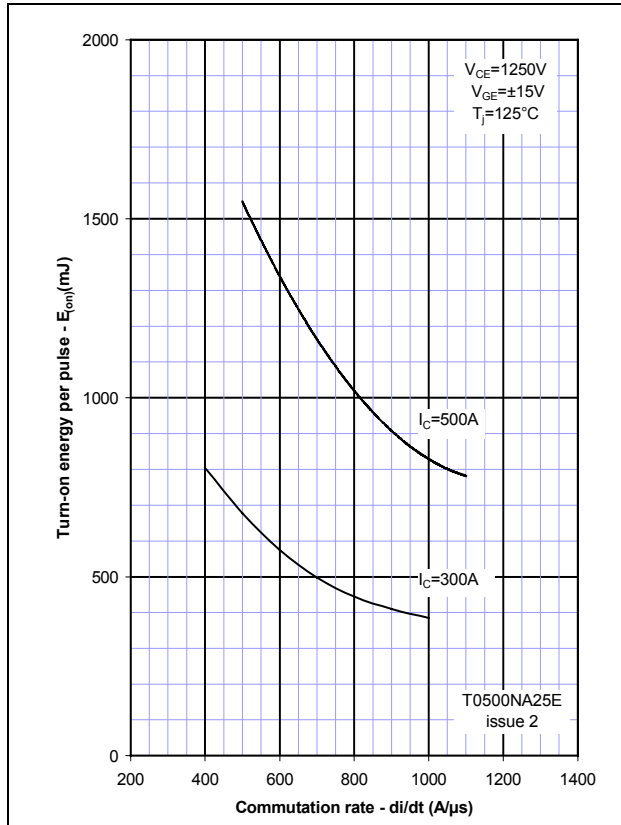


Figure 10 – Typical turn-off energy vs. collector current

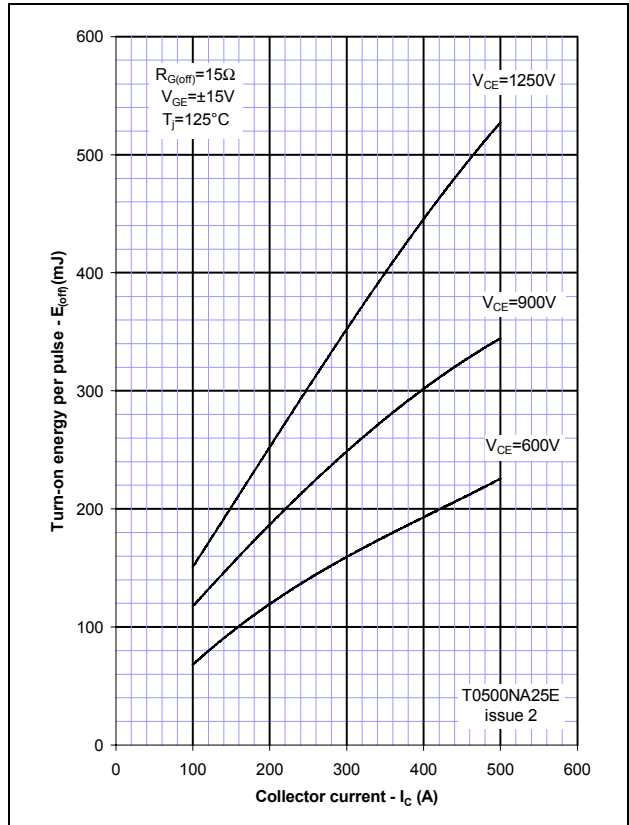


Figure 11 – Turn-off energy vs voltage

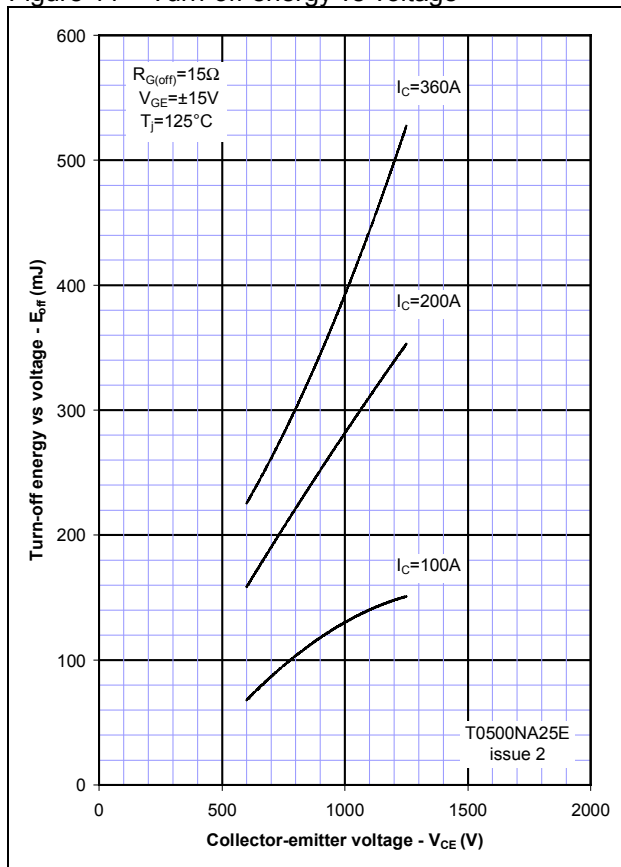


Figure 12 – Safe operating area

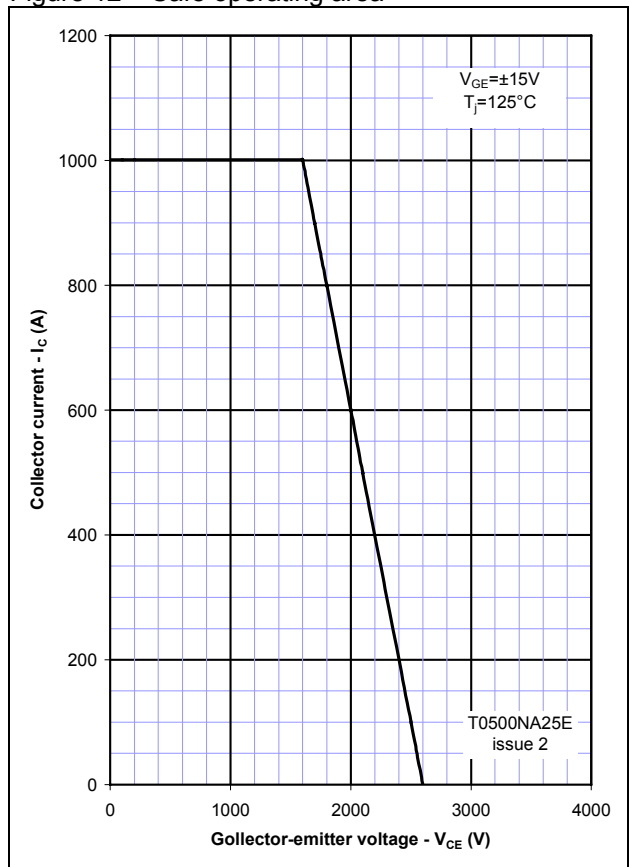
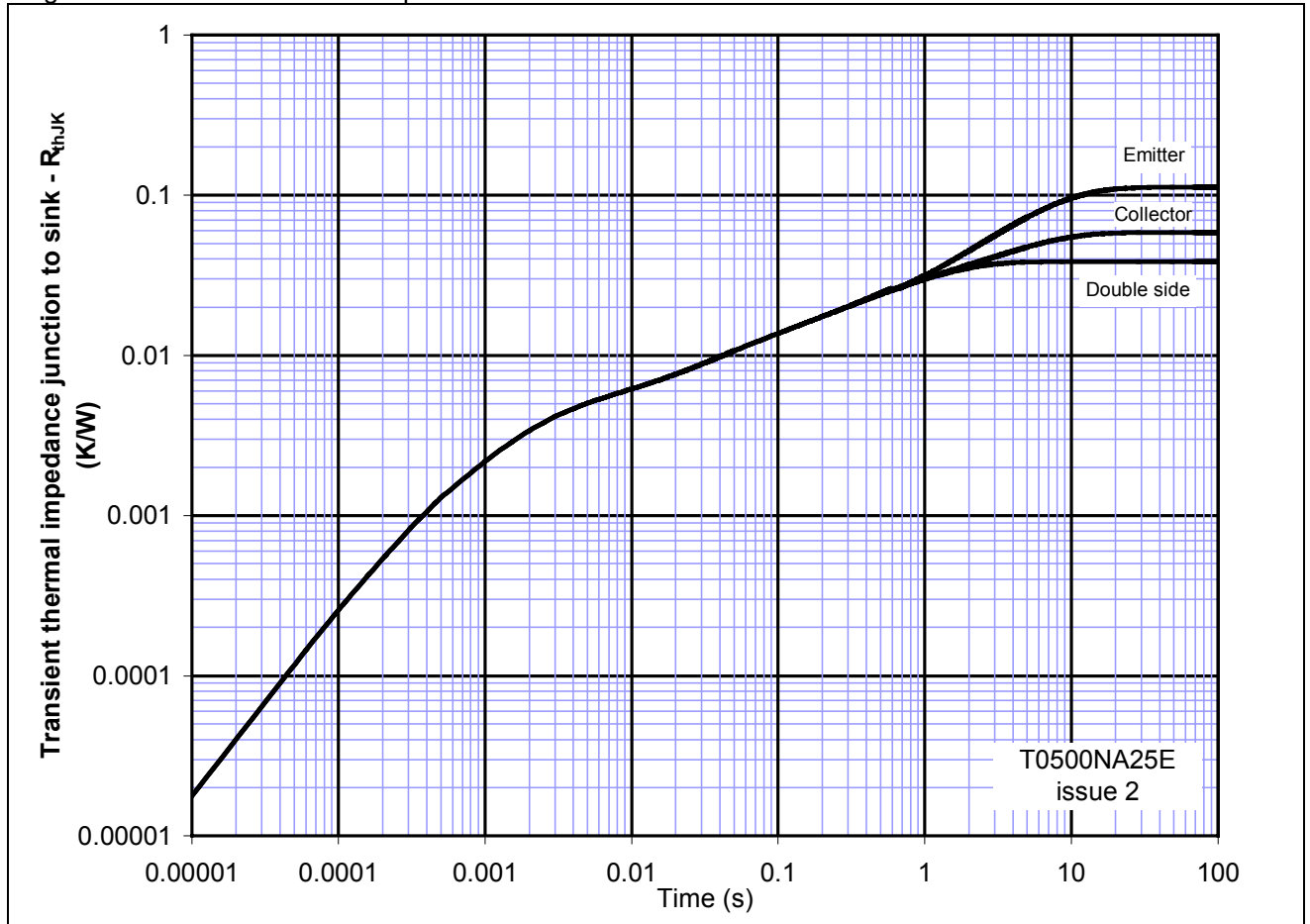
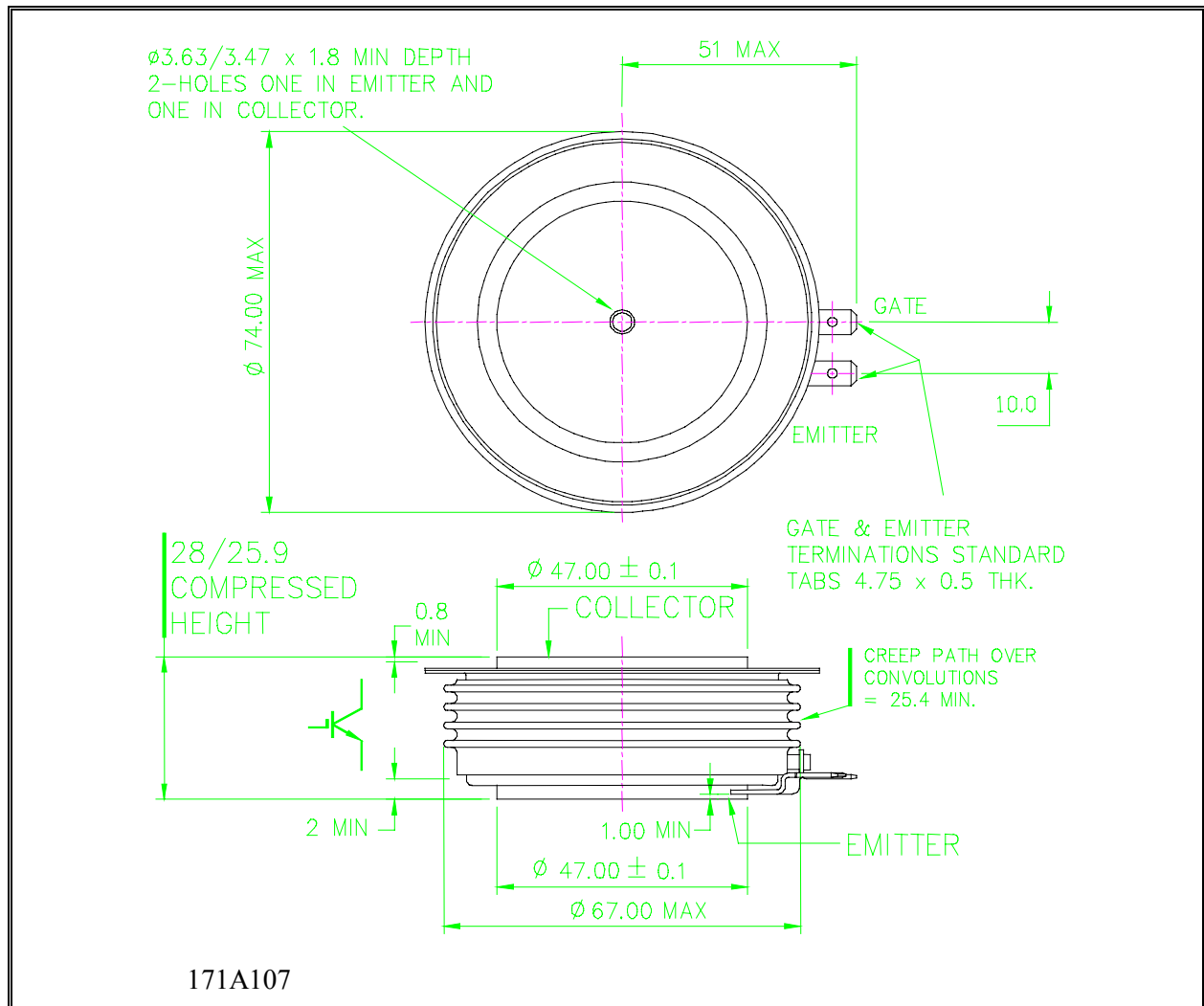


Figure 13 – Transient thermal impedance



Outline Drawing & Ordering Information



ORDERING INFORMATION			
(Please quote 10 digit code as below)			
T0500	NA	25	E
Fixed type code	Fixed Outline Code	Voltage Grade 2500V	Fixed format code

Typical order code: T0500NA25E (V_{CES} = 2500V)

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