

Date: - 12 March, 2018

Data Sheet Issue:- P1

Tentative Data

Insulated Gate Bi-Polar Transistor Type T0600NC17A

Absolute Maximum Ratings

	VOLTAGE RATINGS	MAXIMUM LIMITS	UNITS
V_{CES}	Collector – emitter voltage	1700	V
$V_{DC\ link}$	Permanent DC voltage for 100 FIT failure rate.	900	V
V_{GES}	Peak gate – emitter voltage	±20	V

	RATINGS	MAXIMUM LIMITS	UNITS	
I _C	DC collector current, IGBT	600	Α	
I _{CRM}	Repetitive peak collector current, t _p =1ms, IGBT	1200	Α	
I _{F(DC)}	Continuous DC forward current, Diode	600	Α	
I _{FRM}	Repetitive peak forward current, tp=1ms, Diode	1200	Α	
I _{FSM}	Peak non-repetitive surge t _p =10ms, V _{RM} =60%V _{RRM} , Diode (Note 4)	2410	Α	
I _{FSM2}	Peak non-repetitive surge t _p =10ms, V _{RM} ≤10V, Diode (Note 4)	2650	Α	
P_{MAX}	Maximum power dissipation, IGBT (Note 2)	1.85	kW	
(di/dt) _{cr}	Critical diode di/dt (note 3)	3500	A/µs	
T_j	Operating temperature range.	-40 to +125	°C	
T_{stg}	Storage temperature range.	-40 to +125	°C	

Notes: -

- 1) Unless otherwise indicated T_i = 125°C.
- 2) $T_{sink} = 25^{\circ}C$, double side cooled.
- 3) Maximum commutation loop inductance 240nH.
- 4) Half-sinewave, 125°C T_i initial.



Characteristics

IGBT Characteristics

	PARAMETER	MIN	TYP	MAX	TEST CONDITIONS	UNITS
V	Callactor emitter acturation valtage	-	2.35	2.65	I _C = 600A, V _{GE} = 15V, T _j = 25°C	V
V _{CE(sat)}	Collector – emitter saturation voltage	-	3.0	3.3	I _C = 600A, V _{GE} = 15V	V
V _{T0}	Threshold voltage	-	-	1.22	Current range: 2004 GOOA	V
r _T	Slope resistance	-	-	3.48	Current range: 200A – 600A	mΩ
$V_{\text{GE(TH)}}$	Gate threshold voltage	-	5	-	$V_E = V_{GE}$, $I_C = 20$ mA	V
I _{CES}	Collector – emitter cut-off current		3.5	10	V _{CE} = V _{CES} , V _{GE} = 0V	mA
I_{GES}	Gate leakage current	-	-	±10	$V_{GE} = \pm 20V$	μA
C _{ies}	Input capacitance	-	47	-	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz	nF
$t_{d(on)}$	Turn-on delay time	-	0.22	-		μs
$t_r(V)$	Rise time	-	8.0	-	I _C =600A, V _{CE} =900V, di/dt=3000A/μs	μs
$Q_{g(on)}$	Turn-on gate charge	-	2.6	-	$V_{GE} = \pm 15V$, $L_s = 240$ nH	μC
E _{on}	Turn-on energy	-	0.29	-	$R_{g(ON)}$ = 3.3 Ω , $R_{g(OFF)}$ =24 Ω , C_{GE} =75nF	J
$t_{d(off)}$	Turn-off delay time	-	2	-	Integral diode used as freewheel diode	μs
$t_f(I)$	Fall time	-	0.54	-	(Note 3)	μs
$Q_{g(off)}$	Turn-off gate charge	-	1.5	-		μC
E_{off}	Turn-off energy	-	0.5	-		J
I _{SC}	Short circuit current	-	1500	-	V_{GE} =+15V, V_{CC} =900V, V_{CEmax} \leq V_{CES} , t_p \leq 10 μ s	Α

Diode Characteristics

	PARAMETER	MIN	TYP	MAX	TEST CONDITIONS	UNITS
V_{F}	Forward voltage	-	2.12	2.40	I _F = 600A, T _j =25°C	V
		-	2.24	2.55	I _F = 600A	V
V _{To}	Threshold voltage	-	-	1.42	Current renge 2004 6004	V
r _T	Slope resistance	-	-	1.88	Current range 200A - 600A	mΩ
I _{rm}	Peak reverse recovery current	-	300	-		Α
Q_{rr}	Recovered charge	-	175	-	$I_F = 600A$, $V_r = 900V$, $V_{GE} = -15V$,	μC
t _{rr}	Reverse recovery time, 50% chord	-	0.5	-	di/dt=3000A/µs	μs
Er	Reverse recovery energy	-	0.12	-		J

Thermal Characteristics

	PARAMETER	MIN	TYP	MAX	TEST CONDITIONS	UNITS
		-	-	54.1	Double side cooled	K/kW
R_{thJK}	Thermal resistance junction to sink, IGBT	-	-	93	Collector side cooled	K/kW
		-	-	131	Emitter side cooled	K/kW
		-	-	125	Double side cooled	K/kW
R_{thJK}	Thermal resistance junction to sink, Diode	-	-	205	Cathode side cooled	K/kW
		-	-	319	Anode side cooled	K/kW
F	Mounting force	8	-	12	Note 2	kN
W_t	Weight	-	0.5	-		kg

Notes:-

- 1) Unless otherwise indicated T_j=125°C.
- 2) Consult application note 2008AN01 for detailed mounting requirements
- 3) C_{GE} is additional gate emitter capacitance added to output of gate drive



Curves

Figure 1 – Typical collector-emitter saturation voltage characteristics

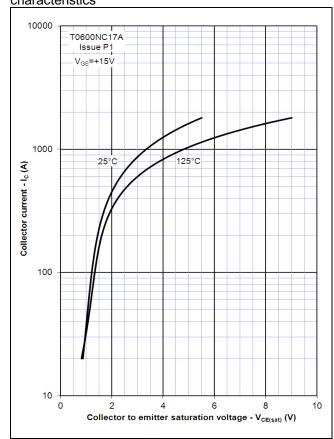


Figure 2 - Typical output characteristic

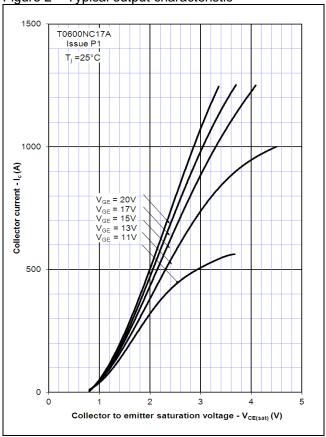


Figure 3 - Typical output characteristic

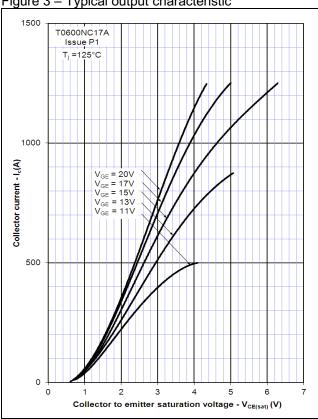


Figure 4 - Safe operating area (IGBT)

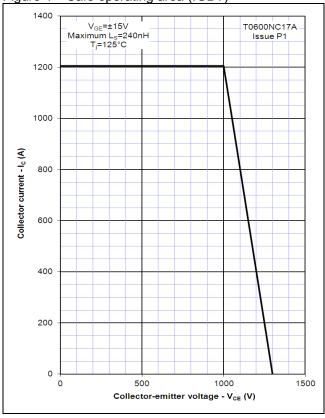




Figure 5 – Typical diode forward characteristics



Figure 6 – Safe operating area (Diode)

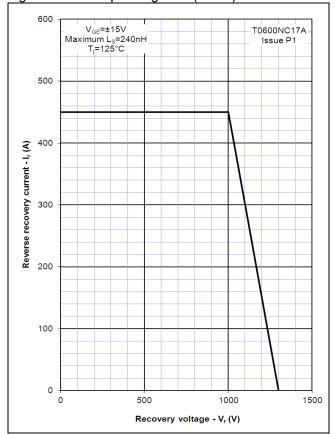


Figure 7 - Transient thermal impedance (IGBT)

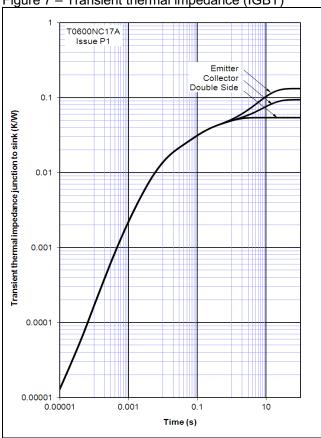
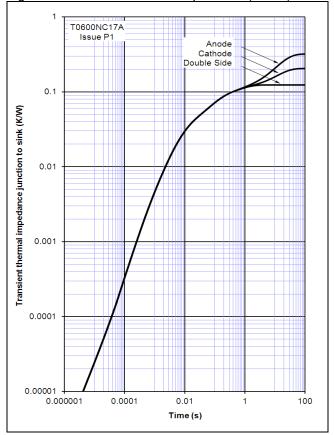
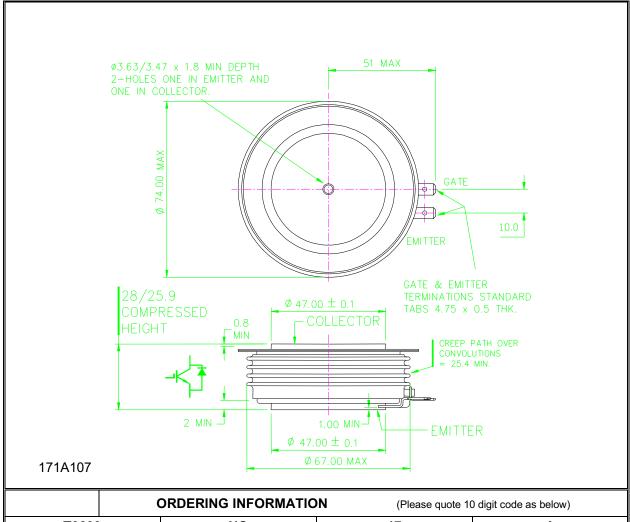


Figure 8 – Transient thermal impedance (Diode)





Outline Drawing & Ordering Information



	ORDERING INFORMATION		(Please quote 10 digit code as below)		
T0600	NC	17	Α		
Fixed type Code	Fixed Outline Code	Voltage Grade V _{CES} /100 17	Fixed format code		

Typical order code: T0600NC17A (Vces = 1700V)

IXYS Semiconductor GmbH

Edisonstraße 15 D-68623 Lampertheim Tel: +49 6206 503-0 Fax: +49 6206 503-627 E-mail: marcom@ixys.de

IXYS Corporation

1590 Buckeye Drive

Milpitas CA 95035-7418

Tel: +1 (408) 457 9000

Fax: +1 (408) 496 0670

E-mail: sales@ixys.net



www.ixysuk.com

www.ixys.net

IXYS UK Westcode Ltd

Langley Park Way, Langley Park, Chippenham, Wiltshire, SN15 1GE. Tel: +44 (0)1249 444524 Fax: +44 (0)1249 659448 E-mail: sales@ixysuk.com

IXYS Long Beach

IXYS Long Beach, Inc 2500 Mira Mar Ave, Long Beach CA 90815

Tel: +1 (562) 296 6584 Fax: +1 (562) 296 6585

E-mail: service@ixyslongbeach.com

The information contained herein is confidential and is protected by Copyright. The information may not be used or disclosed except with the written permission of and in the manner permitted by the proprietors IXYS UK Westcode Ltd.

In the interest of product improvement, IXYS UK Westcode Ltd reserves the right to change specifications at any time without

Devices with a suffix code (2-letter, 3-letter or letter/digit/letter combination) added to their generic code are not necessarily subject to the conditions and limits contained in this report.

© IXYS UK Westcode Ltd.

