

APPLICATIONS

- High Frequency Applications.
- High Power Choppers And Inverters.
- Welding.
- Ultrasonic Generators.
- Induction Heating.
- 400Hz UPS.
- PWM Inverters.

KEY PARAMETERS

V_{DRM}	1400V
$I_{T(RMS)}$	370A
I_{TSM}	2000A
dV/dt	1000V/μs
dI/dt	1000A/μs
t_q	7.0μs

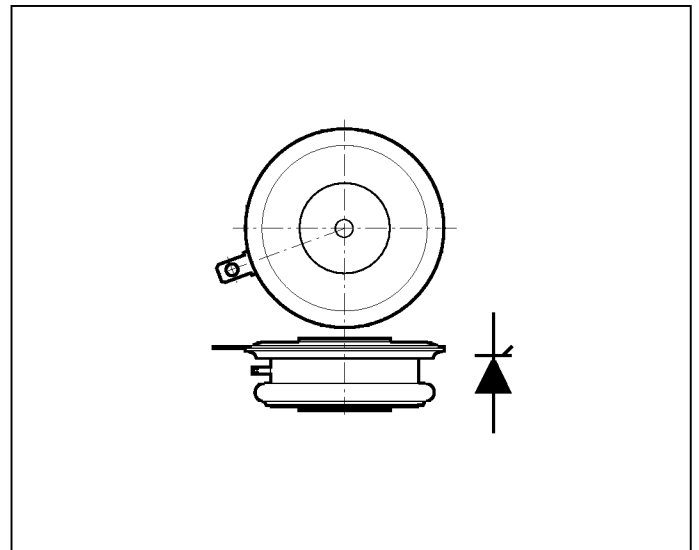
FEATURES

- Low Loss Asymmetrical Diffusion Structure.
- High Interdigitated Amplifying Gate.
- Gate Assisted Turn-off With Exclusive Bypass Diode.
- Fully Characterised For Operation up to 40kHz..
- Directly Compatible With 220-480 A.c. Mains..

VOLTAGE RATINGS

Type Number	Repetitive Peak Off-state Voltage V_{DRM} V	Repetitive Peak Reverse Voltage V_{RRM} V
TA329 14 Q	1400	10
TA329 12 Q	1200	10
TA329 10 Q	1000	10

Lower voltage grades available.



Outline type code: MU86. See package outlines for further information.

CURRENT AND SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
Double Side Cooled				
$I_{T(RMS)}$	RMS value	Half sine wave, duty cycle 50%, $T_{case} = 80^{\circ}C$, $T_j = 125^{\circ}C$.	370	A
I_{TSM}	Surge (non-repetitive) on-state current	$T_j = 125^{\circ}C$, $t_p = 1ms$, $V_R = 0$	2000	A
I^2t	I^2t for fusing	$t_p \geq 10ms$	20×10^3	A ² s

THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions		Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	Double side cooled	dc	-	0.085	°C/W
		Single side cooled	Anode dc	-	0.153	°C/W
			Cathode dc	-	0.204	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Clamping force 4.0kN with mounting compound	Double side	-	0.02	°C/W
			Single side	-	0.04	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)		-	135	°C
		Reverse (blocking)		-	125	°C
T_{stg}	Storage temperature range			-40	150	°C
-	Clamping force			3.6	4.4	kN

DYNAMIC CHARACTERISTICS

Symbol	Parameter	Conditions		Min.	Max.	Units
V_{TM}	Maximum on-state voltage	At 600A peak, $T_{case} = 125^{\circ}C$		-	2.5	V
I_{RRM}	Peak reverse current	At V_{RRM} , $T_{case} = 125^{\circ}C$		-	30	mA
I_{DRM}	Off-state current	At V_{DRM} , $T_{case} = 125^{\circ}C$		-	1	mA
dV/dt	Maximum linear rate of rise of off-state voltage	To 60% V_{DRM} , $T_j = 125^{\circ}C$, Gate open circuit		-	1000	V/ μ s
dI/dt	Rate of rise of on-state current	Gate source 20V, 20 Ω $t_r \leq 5\mu$ s.	Non-repetitive	-	1000	A/ μ s
			Repetitive	-	500	A/ μ s
t_q^{\dagger}	Max. gate assisted turn-off time (with feedback diode)	$T_j = 125^{\circ}C$, $I_{T(PK)} = 200A$, $t_p = 25\mu$ s (half sine wave), $V_R = DF451$ Diode voltage drop, dV/dt = 600V/ μ s (linear to 60% V_{DRM}), $V_{GK} = -5V$		-	7	μ s
t_q	Max. turn-off time (with feedback diode)	$T_j = 125^{\circ}C$, $I_{TM} = 100A$, $t_p > 100\mu$ s, dI _R /dt = 30A/ μ s, $V_R = 1V$, dV/dt = 600V/ μ s (linear to 60% V_{DRM}), Gate open.		-	10	μ s

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{GT}	Gate trigger voltage	$V_{DWM} = 12V, R_L = 3\Omega, T_{case} = 25^\circ C$	-	4	V
I_{GT}	Gate trigger current	$V_{DWM} = 12V, R_L = 3\Omega, T_{case} = 25^\circ C$	-	250	mA
V_{RGM}	Peak reverse gate voltage	-	-	7	V
I_{FGM}	Peak forward gate current	-	-	10	A
P_{GM}	Peak gate power	-	-	50	W
$P_{G(AV)}$	Average gate power	-	-	15	W

CURVES

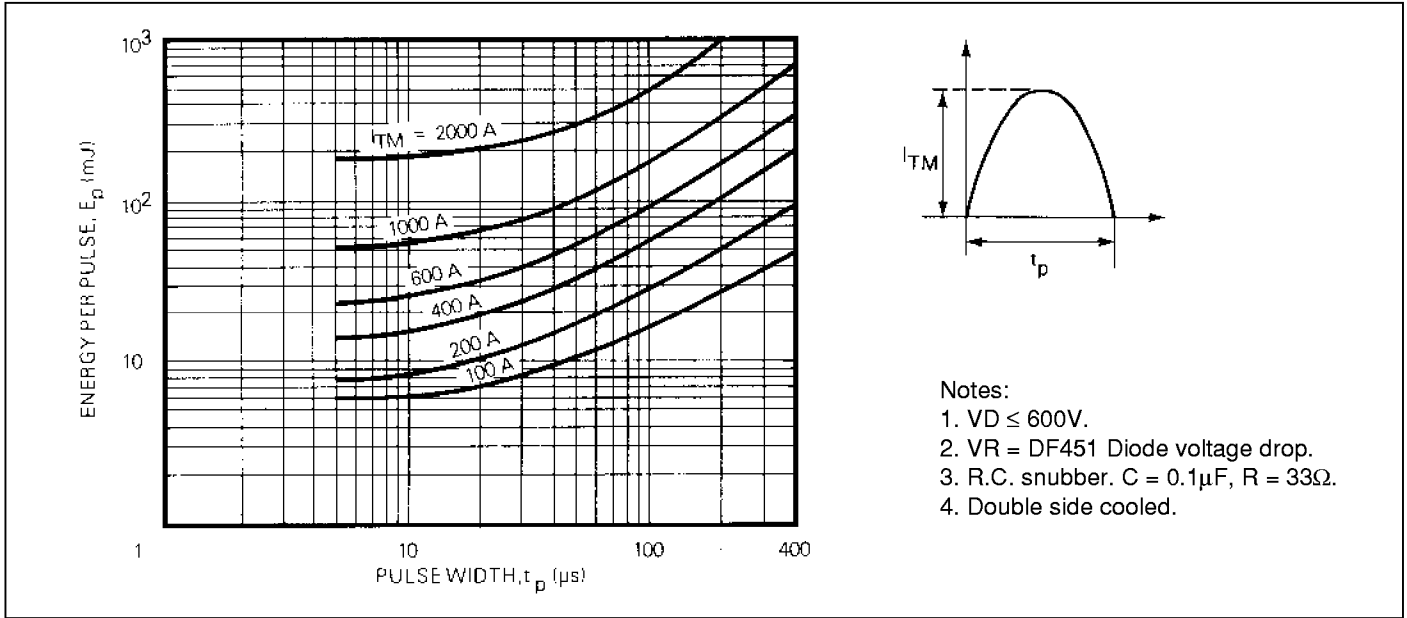


Fig.1 Energy per pulse for sinusoidal pulses.

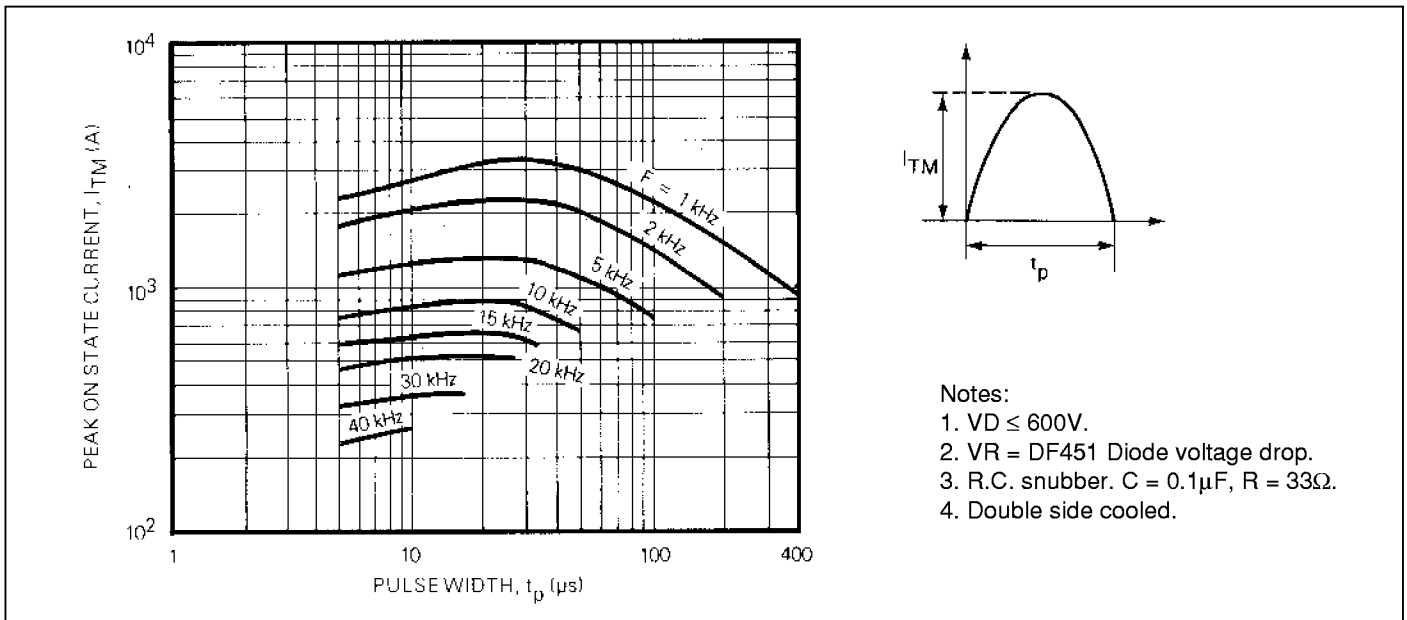


Fig.2 Maximum allowable peak on-state current vs pulse width for $T_{case} = 65^\circ C$.

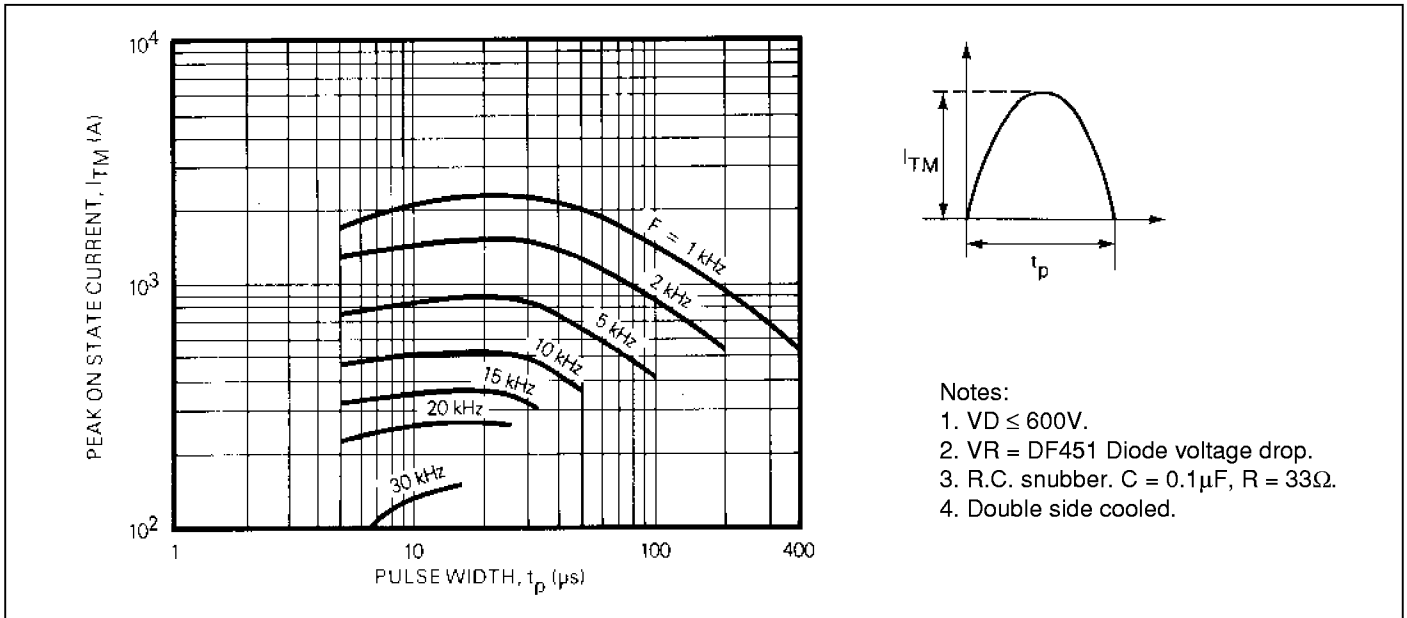


Fig.3 Maximum allowable peak on-state current vs pulse width for $T_{case} = 90^\circ C$.

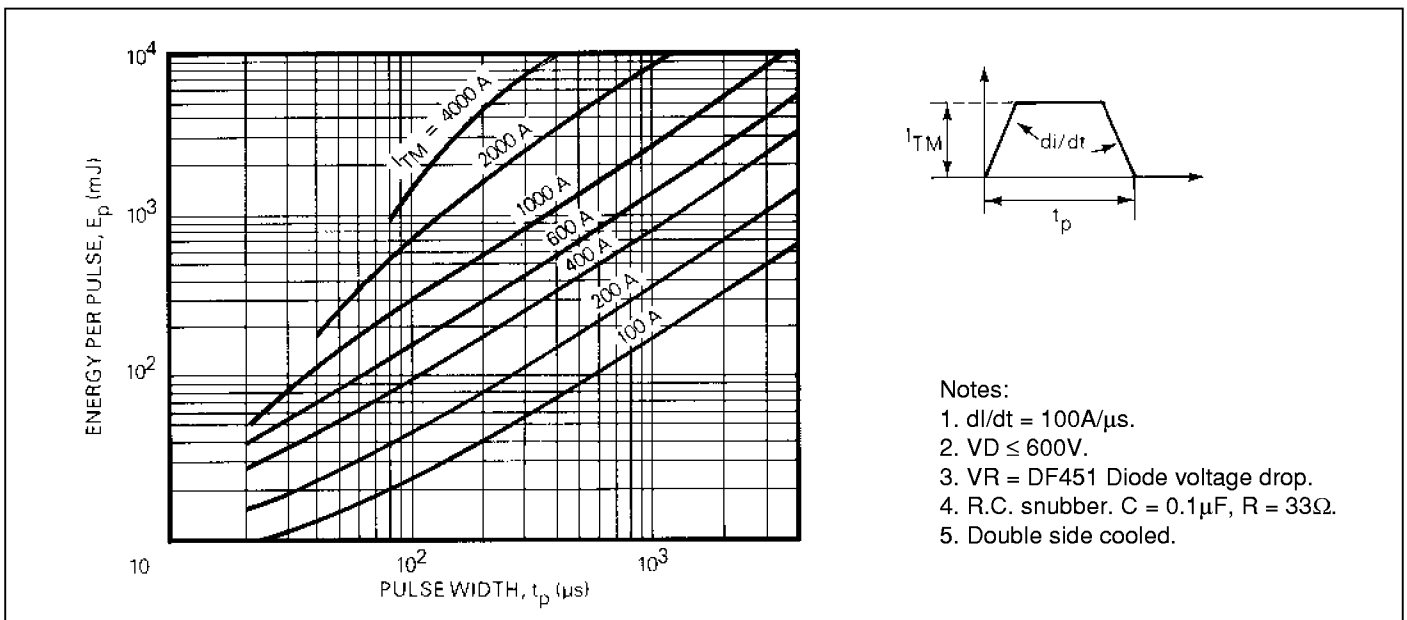


Fig.4 Energy per pulse for trapezoidal pulses

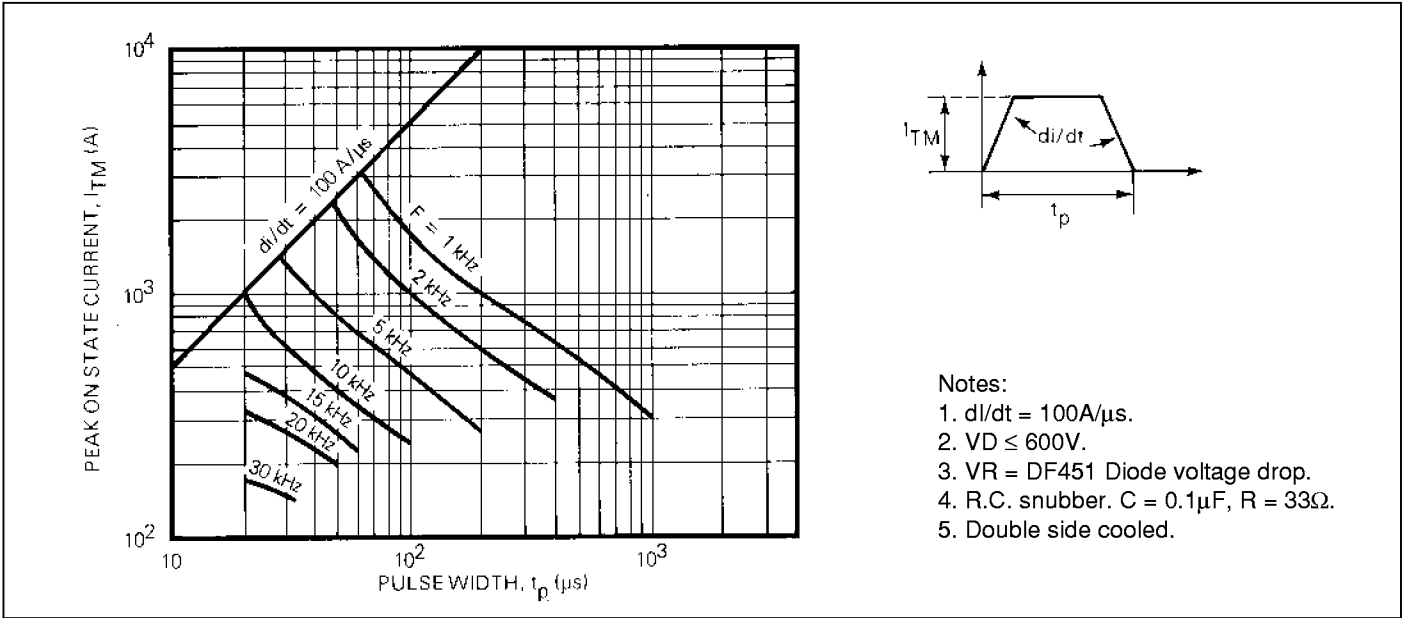


Fig.5 Maximum allowable peak on-state current vs pulse width for $T_{case} = 65^\circ C$.

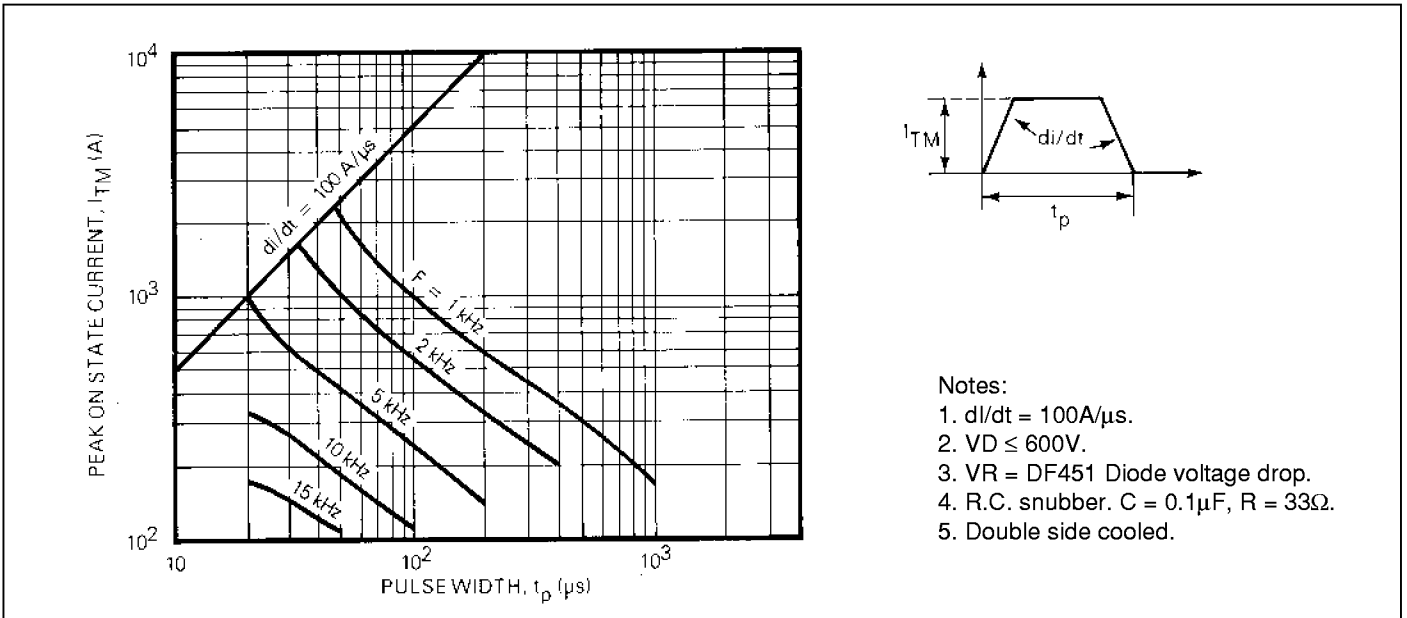


Fig.6 Maximum allowable peak on-state current vs pulse width for $T_{case} = 90^\circ C$.

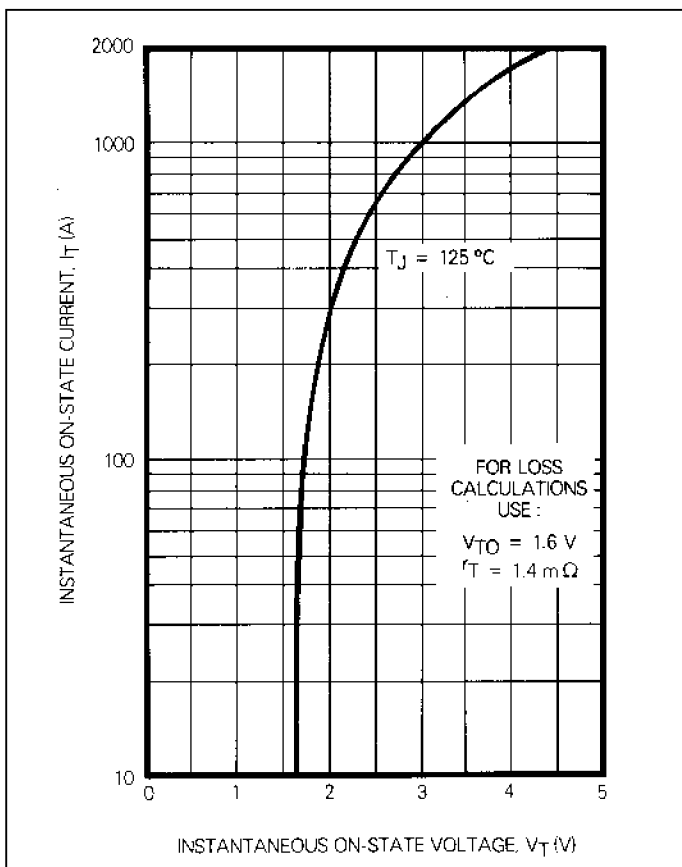


Fig.7 Maximum on-state conduction characteristic

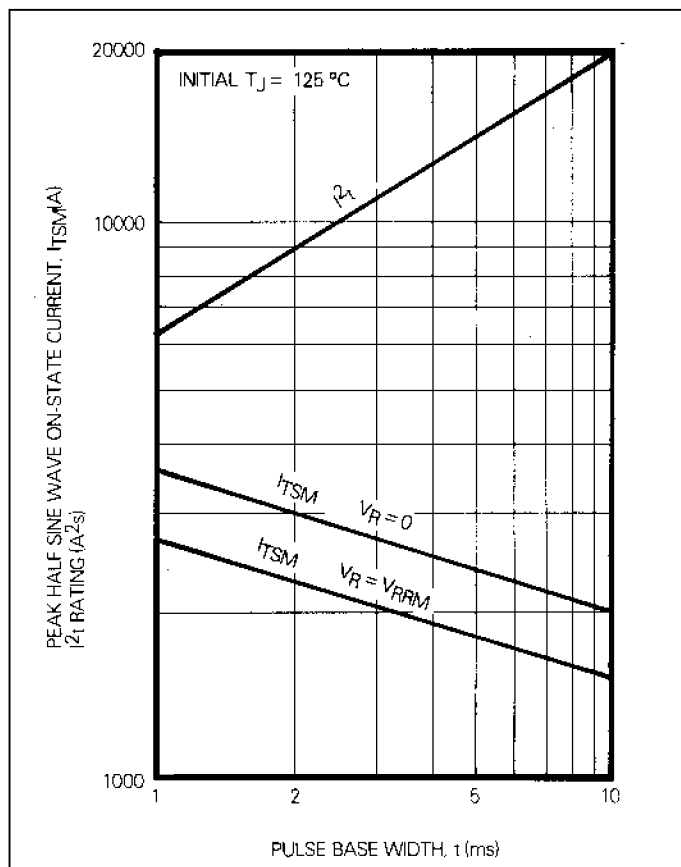


Fig.8 Non-repetitive sub-cycle surge on-state current and \hat{P}_t rating.

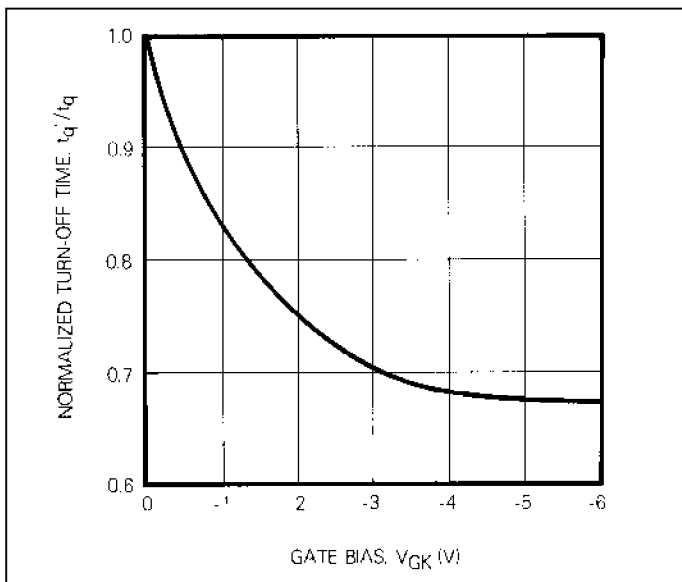


Fig.9 Typical variation of effective turn-off time (t_q^+) with negative gate bias.

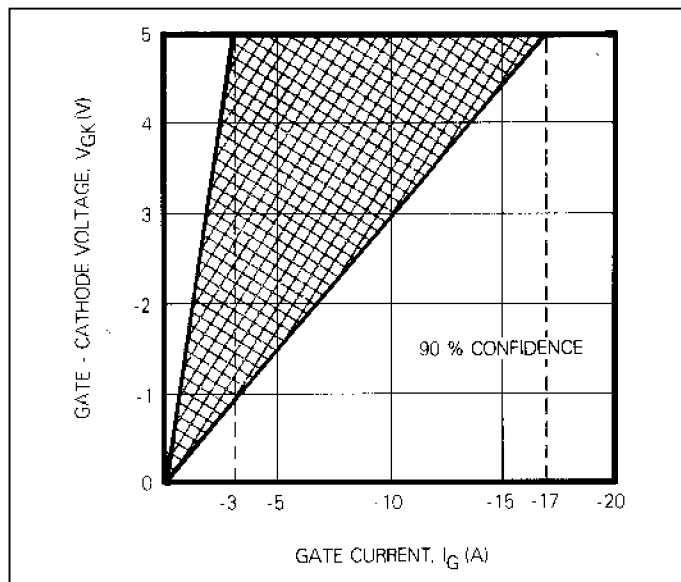


Fig.10 Reverse gate characteristics

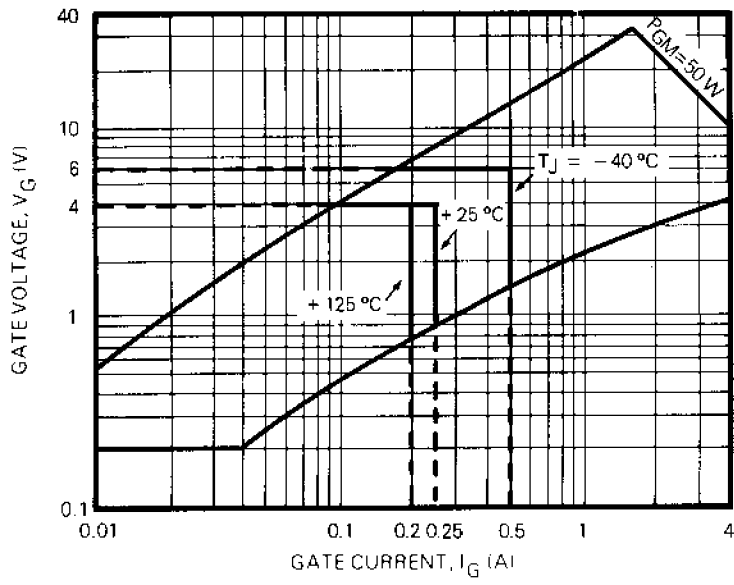


Fig.11 Gate trigger characteristics

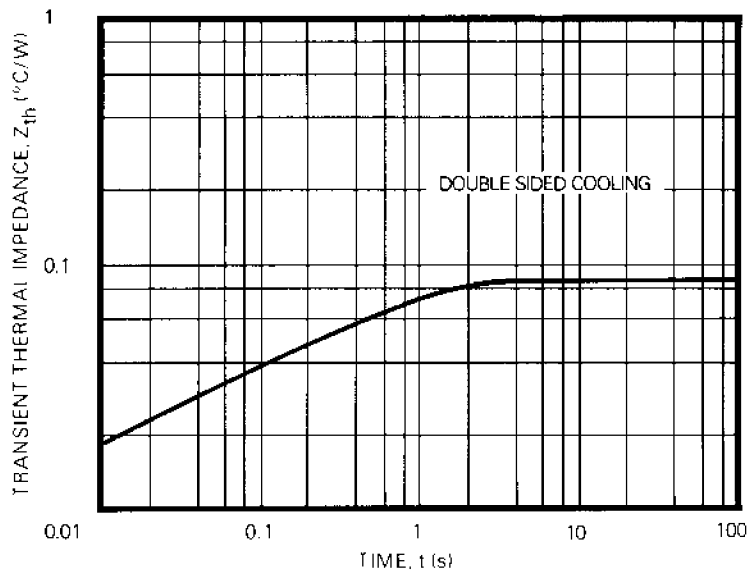
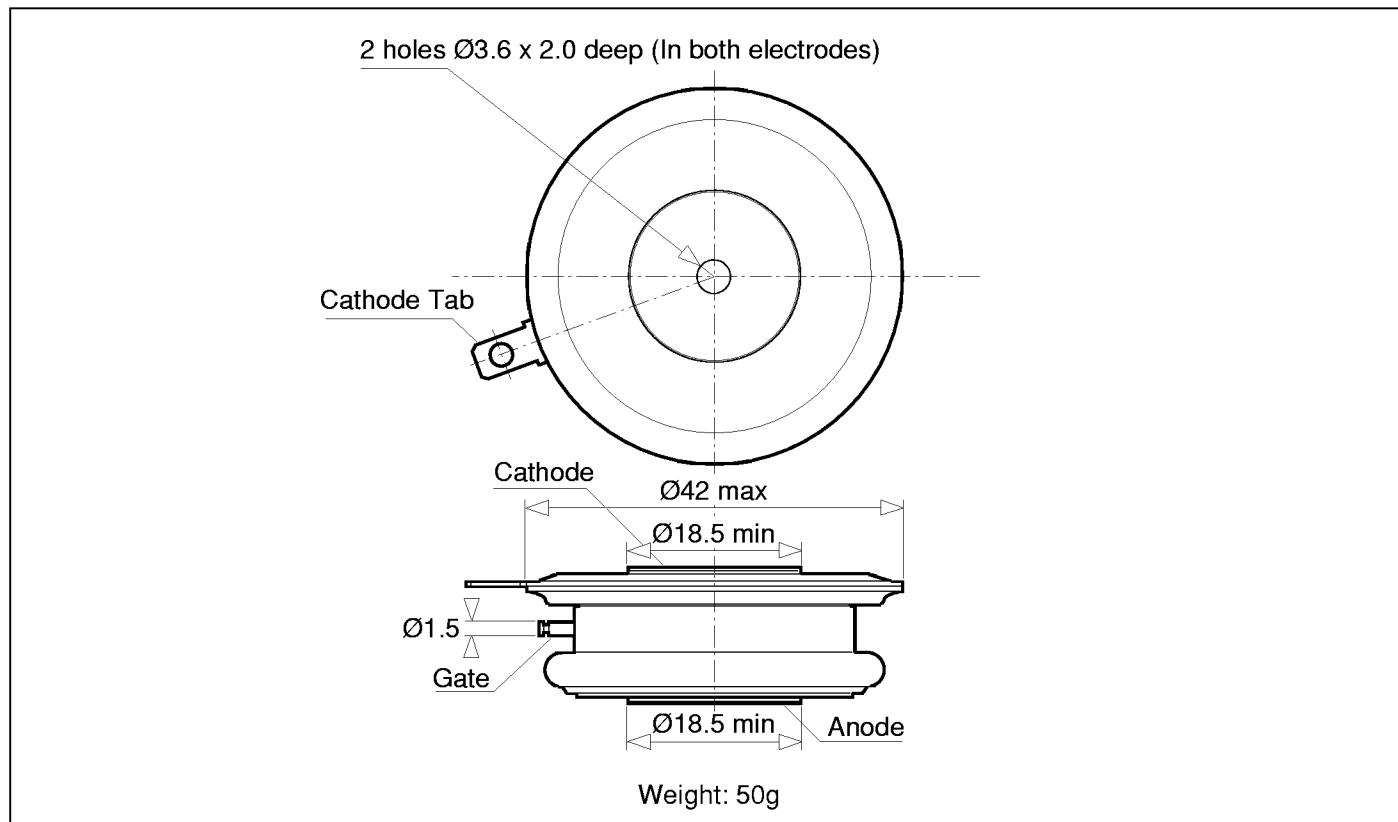


Fig.12 Transient thermal impedance - junction to case

PACKAGE DETAILS - MU86

For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



HEADQUARTERS OPERATIONS
MITEL SEMICONDUCTOR
 Cheney Manor, Swindon,
 Wiltshire SN2 2QW, United Kingdom.
 Tel: (01793) 518000
 Fax: (01793) 518411

MITEL SEMICONDUCTOR
 1500 Green Hills Road,
 Scotts Valley, California 95066-4922
 United States of America.
 Tel (408) 438 2900
 Fax: (408) 438 5576/6231

Internet: <http://www.gpsemi.com>

POWER PRODUCT CUSTOMER SERVICE CENTRES

- **FRANCE, BENELUX & SPAIN** Les Ulis Cedex Tel: (1) 69 18 90 00 Fax : (1) 64 46 54 50
- **GERMANY** Munich Tel: (089) 419508-20 Fax : (089) 419508-55
- **NORTH AMERICA** Dedham, USA Tel: (781) 251 0126 Fax: (781) 251 0106
- **UK** Lincoln Tel: (01522) 500500 Fax : (01522) 510550

These are supported by Agents and Distributors in major countries world-wide.

© Mitel Corporation 1998 Publication No. DS4680-2 Issue No. 2.1 March 1998

TECHNICAL DOCUMENTATION – NOT FOR RESALE. PRINTED IN UNITED KINGDOM

This publication is issued to provide information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose nor form part of any order or contract nor to be regarded as a representation relating to the products or services concerned. No warranty or guarantee express or implied is made regarding the capability, performance or suitability of any product or service. The Company reserves the right to alter without prior notice the specification, design or price of any product or service. Information concerning possible methods of use is provided as a guide only and does not constitute any guarantee that such methods of use will be satisfactory in a specific piece of equipment. It is the user's responsibility to fully determine the performance and suitability of any equipment using such information and to ensure that any publication or data used is up to date and has not been superseded. These products are not suitable for use in any medical products whose failure to perform may result in significant injury or death to the user. All products and materials are sold and services provided subject to the Company's conditions of sale, which are available on request.

All brand names and product names used in this publication are trademarks, registered trademarks or trade names of their respective owners.