59C 02690 D T-11-23

THOMSON-CSF
DIVISION SEMICONDUCTEURS

ICTE 5S, C → ICTE 45, C

UNI — AND BIDIRECTIONAL TRANSIENT VOLTAGE SUPPRESSORS
DIODES DE PROTECTION UNI — ET BIDIRECTIONNELLES

TRANSIL

TRANSIENT VOLTAGE SUPPRESSOR DIODES ESPECIALLY USEFUL IN PROTECTING INTEGRATED CIRCUITS, MOS, HYBRIDS AND OTHER VOLTAGE—SENSITIVE SEMICONDUCTORS AND COMPONENTS

- HIGH SURGE CAPABILITY : 1,5 kW/1 ms expo.
  18 kW/8-20 µs expo.
- VERY FAST CLAMPING TIME : 1 ps for unidirectional types
  5 ns for bidirectional types
- LARGE VOLTAGE RANGE : 5V → 45V

DIODES ECRETEUSES ADAPTEES A LA PROTECTION DES CIRCUITS INTEGRES, MOS, CIRCUITS HYBRIDES, AUTRES SEMICONDUCTEURS ET COMPOSANTS SENSIBLES AUX SURTENSIONS.

- *GRANDE CAPACITE DE SURCHARGE : 1,5 kW/1ms expo.*
  18 kW/8-20 µs expo.
- *TEMPS D'ECRETAGE TRES RAPIDE :*
  1 ps pour types unidirectionnels
  5 ns pour types bidirectionnels
- *GAMME DE TENSION ETENDUE : 5V → 45V*

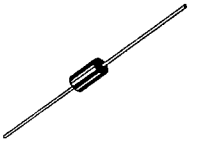
P_p : 1,5 kW/1ms expo.
18 kW/8-20 µs expo.

V_{RM} : 5V → 45V

Type number → Unidirectional types

Type number + suffix C → Bidirectional types

Case
Boîtier : CB-429 plastic
note 2



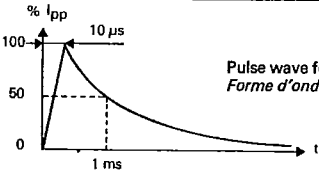
ABSOLUTE RATINGS (LIMITING VALUES)
VALEURS LIMITES ABSOLUES D'UTILISATION

Peak pulse power for 1 ms exponential pulse *Puissance de crête pour une onde exponentielle de 1 ms*	T_J initial = 25°C (cf note 1)	P_p	1,5	kW
Power dissipation on infinite heatsink *Dissipation de puissance sur radiateur infini*	T_{amb} = 75°C	P	5	W
Non repetitive surge peak forward current for unidirectional types *Courant direct non répétitif de surcharge accidentelle pour types unidirectionnels*	T_J initial = 25°C t = 10 ms	I_{FSM}	250	A
Storage and junction temperatures *Températures de jonction et de stockage*		T_J T_{stg}	175 −65 → + 175	°C °C
Maximum lead temperature for soldering during 10 s at 4 mm from case *Température maximum de soudure des connexions pendant 10 s à 4 mm du boîtier*		T_L	230	°C

Junction - connexions thermal resistance on infinite heatsink (L_{lead} = 10 mm) *Résistance thermique jonction - connexions sur radiateur infini ($L_{connex.}$ = 10 mm)*	$R_{th\ (j-c)}$	20	°C/W

Note 1 : For surges upper than the maximum values, the diode will present a short-circuit anode-cathode.
Pour des surcharges supérieures aux valeurs maximales, la diode présentera un court-circuit anode-cathode.

Note 2 : Please consult us for types in DO 13 case.
Nous consulter pour version en boîtier DO 13.



Pulse wave form 10/1000
Forme d'onde 10/1000

50, rue Jean-Pierre Timbaud - B P. 5
F - 92403 Courbevoie Cedex FRANCE
Tél. : (1) 788-50-01 Telex : 610560 F

THOMSON COMPOSANTS

ICTE 5S, C → ICTE ..., C

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ELECTRICAL CHARACTERISTICS
CARACTERISTIQUES ELECTRIQUES

Stand-off voltage / *Tension de veille* : V_{RM}

Breakdown voltage / *Tension d'avalanche* : $V_{(BR)}$

Clamping voltage / *Tension d'écrêtage* : $V_{(CL)}$

Peak pulse current / *Courant de crête* : I_{pp}

Temperature coefficient of $V_{(BR)}$ / *Coefficient de température de* $V_{(BR)}$: αT

Capacitance / *Capacité* : C

Clamping time (0 Volt to $V_{(BR)}$) / *Temps de réponse (0 Volt à* $V_{(BR)}$*)* : $t_{clamping} < 1$ ps for unidirectional types
$t_{clamping} < 5$ ns for bidirectional types

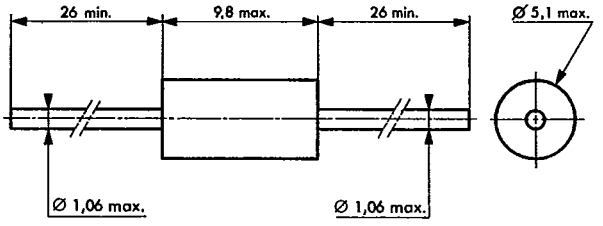
Types		I_{RM} @ V_{RM}		$V_{(BR)}$* @ I_R min		$V_{(CL)}$ @ I_{pp} max 1 ms expo		$V_{(CL)}$ @ I_{pp} max 1 ms expo		I_{pp} max 1 ms expo	I_{pp} max 8-20 µs expo	αT max	C** typ $V_R = 0$ f = 1 MHz
Unidirectional	Bidirectional	(µ A)	(V)	(V)	(mA)	(V)	(A)	(V)	(A)	(A)	(A)	(10^{-4}/°C)	(pF)
ICTE 5S	ICTE 5 SC	300	5	5,5	1	6,6	1	6,9	10	170	1570	5,7	26000
ICTE 5	ICTE 5 C	300	5	6,0	1	7,1	1	7,5	10	160	1340	5,7	22000
ICTE 8	ICTE 8 C	25	8	9,4	1	11,3	1	11,5	10	100	920	7,3	13000
ICTE 10	ICTE 10 C	2	10	11,7	1	13,7	1	14,1	10	90	830	8,1	8800
ICTE 12	ICTE 12 C	2	12	14,1	1	16,1	1	16,5	10	70	630	8,4	7800
ICTE 15	ICTE 15 C	2	15	17,6	1	20,1	1	20,6	10	60	550	8,8	6200
ICTE 18	ICTE 18 C	2	18	21,2	1	24,2	1	25,2	10	50	440	9,4	4600
ICTE 22	ICTE 22 C	2	22	25,9	1	29,8	1	32,0	10	40	360	9,6	4200
ICTE 36	ICTE 36 C	2	36	42,4	1	50,6	1	54,3	10	23	230	10,1	2200
ICTE 45	ICTE 45 C	2	45	52,9	1	63,3	1	70,0	10	19	170	10,3	1850

* Pulse test / *Mesure en impulsion* $t_p \leq 50$ ms $\delta < 2$ %

** Divide these values by 2 for bidirectional types / *Diviser ces valeurs par 2 pour les types bidirectionnels*

For bidirectional types, electrical characteristics apply in both directions.
Pour les types bidirectionnels, les caractéristiques électriques sont applicables dans les 2 sens.

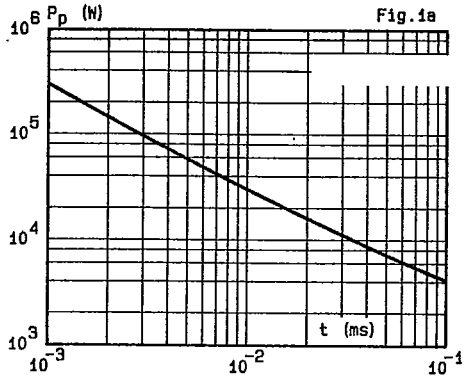
CASE DESCRIPTION
DESCRIPTION DU BOITIER

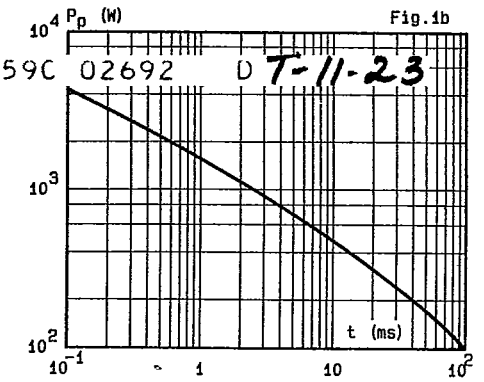


Cooling method : by convection (method A)
Mode de refroidissement : par convection (mode A)

Marking : type number ; white band indicates cathode for unidirectional types
Marquage : n° de type ; anneau blanc côté cathode pour les types unidirectionnels.

Weight / *Poids* : 0,9 g





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Fig.1a-1b - Peak pulse power versus exponential pulse duration.

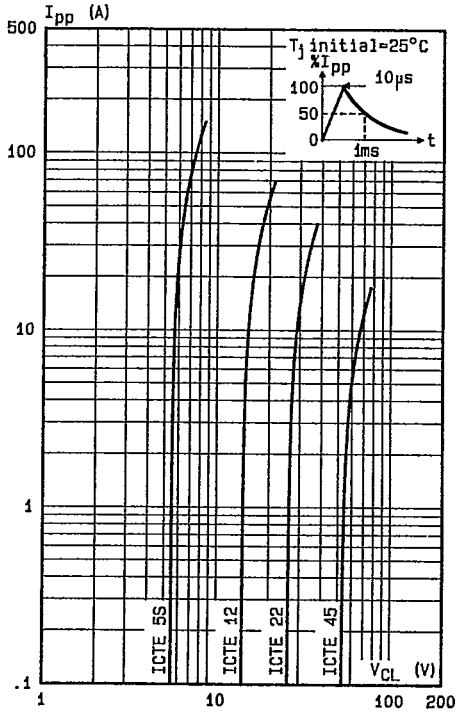


Fig.2 - Peak pulse current versus clamping voltage (exponential waveform t=1ms).

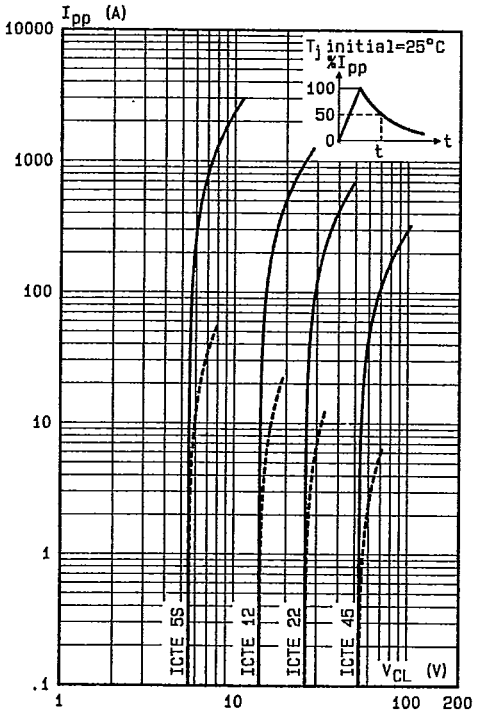


Fig.3 - Peak pulse current versus clamping voltage (exponential waveform t=10µs ——— and t=10ms - - -).

Note: The curves of figures 2 and 3 are specified for a junction temperature of 25°C before surge. The given results may be extrapolated for other junction temperatures by using the following formula :

$$\Delta V_{(BR)} = \alpha_{T(V(BR))} \times [T_j - 25] \times V_{(BR)}$$

For intermediate voltages, extrapolate the given results.

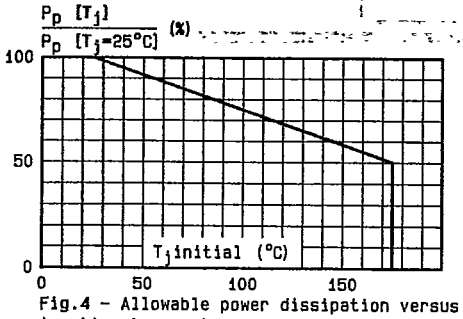


Fig.4 - Allowable power dissipation versus junction temperature.

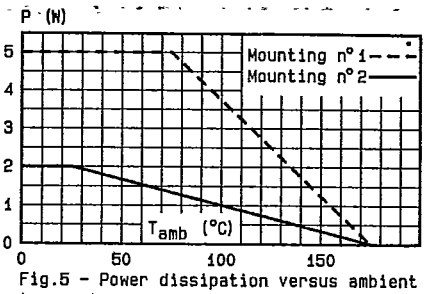


Fig.5 - Power dissipation versus ambient temperature.

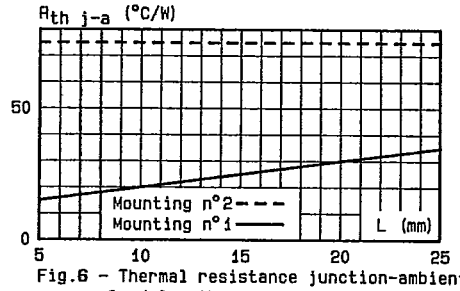
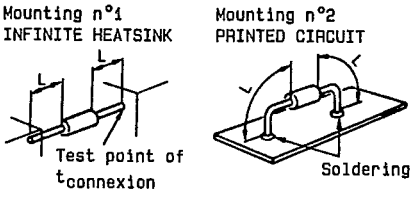


Fig.6 - Thermal resistance junction-ambient versus lead length.



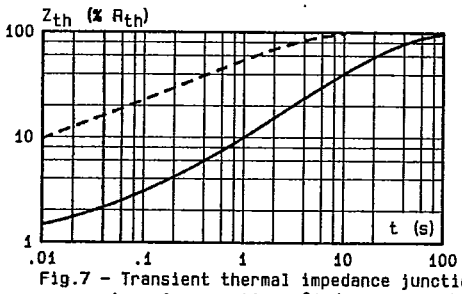


Fig.7 - Transient thermal impedance junction -connexions for mounting n°1 (curve - - -) and junction-ambient for mounting n°2 (curve ———) versus pulse duration (L=10mm).

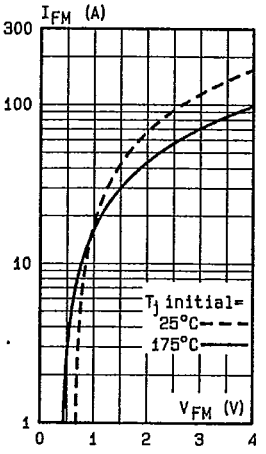


Fig.8 - Peak forward current versus peak forward voltage drop (typical values for unidirectional types).

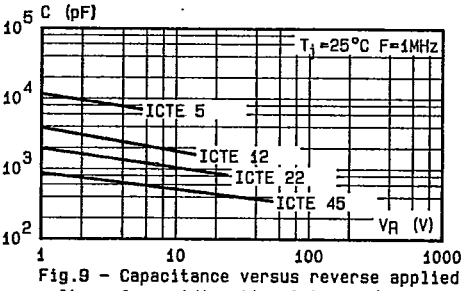


Fig.9 - Capacitance versus reverse applied voltage for unidirectional types (typical values).

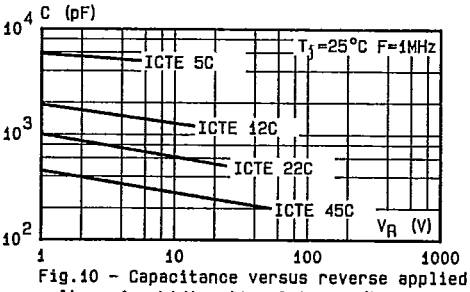


Fig.10 - Capacitance versus reverse applied voltage for bidirectional types (typical values).