



DIVISION SEMICONDUCTEURS

59C 02690 D T-11-23

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  $\mu$ s 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/1 ms expo.  
18 kW/8-20  $\mu$ s expo.
- TEMPS D'ECRETAGE TRES RAPIDE :  
1 ps pour types unidirectionnels  
5 ns pour types bidirectionnels
- GAMME DE TENSION ETENDUE : 5V → 45V

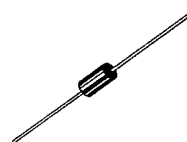
$P_p$  : 1,5 kW/1 ms expo.  
18 kW/8-20  $\mu$ s expo.

$V_{RM}$  : 5V → 45V

Type number → Unidirectional types

Type number + suffix C → Bidirectional types

Case : CB-429 plastic  
Boîtier : note 2

**ABSOLUTE RATINGS (LIMITING VALUES)**  
**VALEURS LIMITEES ABSOLUES D'UTILISATION**

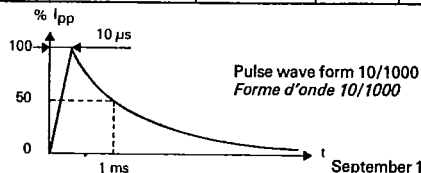
Peak pulse power for 1 ms exponential pulse <i>Puissance de crête pour une onde exponentielle de 1 ms</i>	$T_J$ initial = 25°C (cf note 1)	$P_p$	1,5	kW
Power dissipation on infinite heatsink <i>Dissipation de puissance sur radiateur infini</i>	$T_{amb}$ = 75°C	P	5	W
Non repetitive surge peak forward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



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

365

September 1983 - 1/4  
**THOMSON**  
COMPOSANTS

ICTE5S, C → ICTL 45, C

59C 02691 D T-11-23

**ELECTRICAL CHARACTERISTICS**  
**CARACTERISTIQUES ELECTRIQUES**

Stand-off voltage :  $V_{RM}$   
Tension de veille :  $V_{RM}$   
Peak pulse current :  $I_{pp}$   
Courant de crête :  $I_{pp}$

Breakdown voltage :  $V_{(BR)}$   
Tension d'avalanche :  $V_{(BR)}$   
Temperature coefficient of  $V_{(BR)}$  :  $\alpha T$   
Coefficient de température de  $V_{(BR)}$  :  $\alpha T$

Clamping voltage :  $V_{(CL)}$   
Tension d'écrêtage :  $V_{(CL)}$   
Capacitance :  $C$   
Capacité

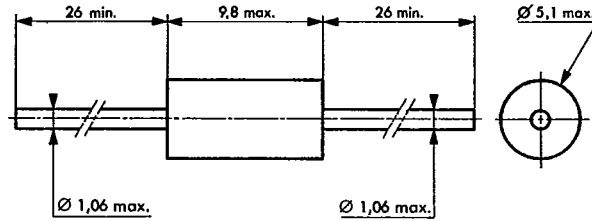
Clamping time (0 Volt to  $V_{(BR)}$ ) :  $t_{clamping} < 1$  ps for unidirectional types  
Temps de réponse (0 Volt à  $V_{(BR)}$ ) :  $t_{clamping} < 5$  ns for bidirectional types

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 $\mu$ s expo	$\alpha T$ max	$C^{**}$ typ $V_R = 0$ $f = 1$ MHz
Unidirectional	Bidirectional	( $\mu$ A)	(V)	(V)	(mA)	(V)	(A)	(V)	(A)	(A)	(A)	(10 <sup>-4</sup> /°C)	(pF)
ICTE 5S	ICTE 5 SC	300	5	6,5	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 : 0,9 g  
Poids

ICTE 55, C → ICTE 45, C

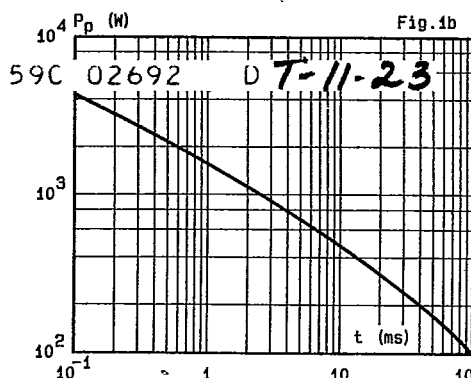
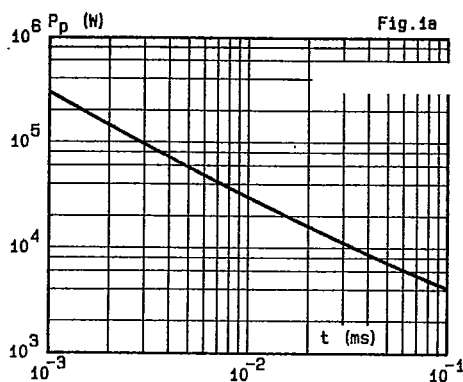


Fig. 1a-1b - Peak pulse power versus exponential pulse duration.

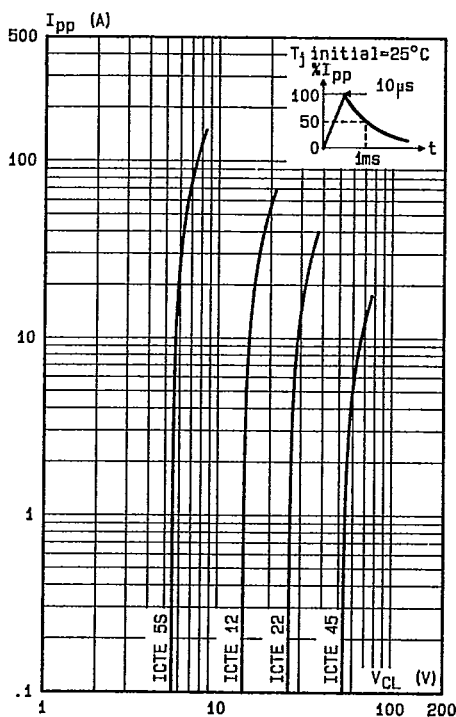


Fig. 2 - Peak pulse current versus clamping voltage (exponential waveform t=1ms).

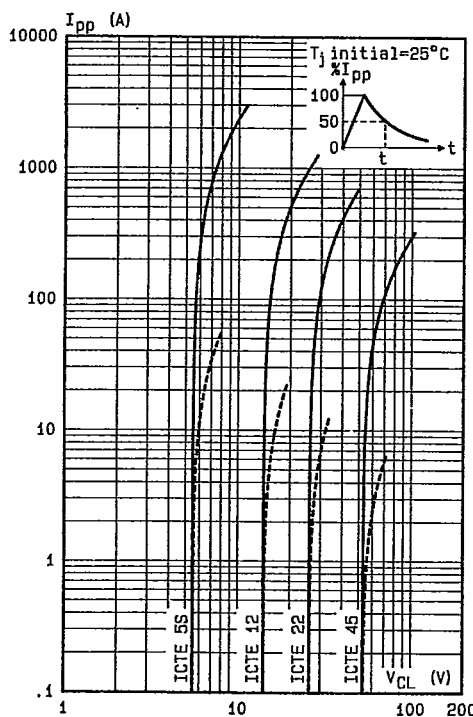


Fig. 3 - Peak pulse current versus clamping voltage (exponential waveform t=10μs — and t=10ms ---).

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.

ICTE 5S, C → ICTE 45, C

59C 02693 DT-11-23

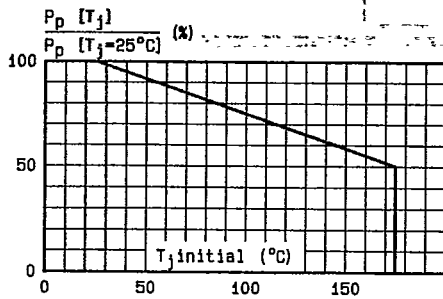


Fig. 4 - Allowable power dissipation versus junction temperature.

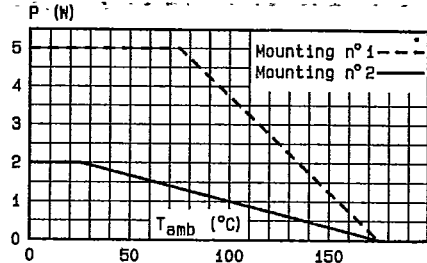


Fig. 5 - Power dissipation versus ambient temperature.

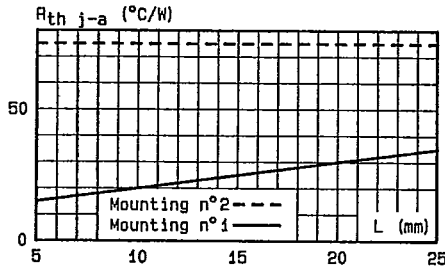


Fig. 6 - Thermal resistance junction-ambient versus lead length.

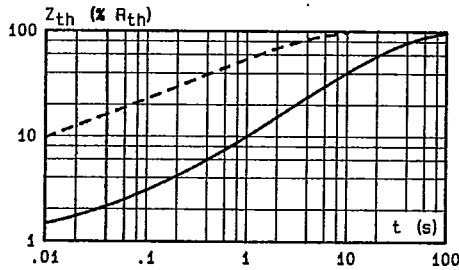
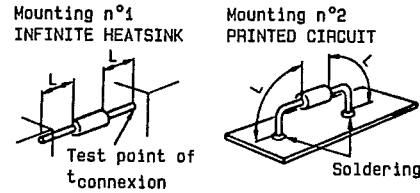


Fig. 7 - Transient thermal impedance junction-connexions for mounting n°1 (curve ---) and junction-ambient for mounting n°2 (curve —) versus pulse duration (L=10mm).

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

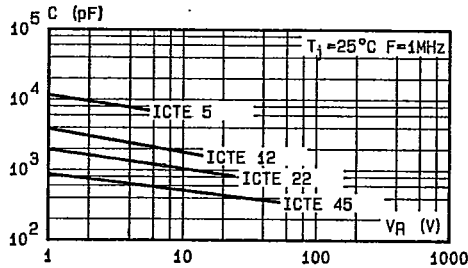
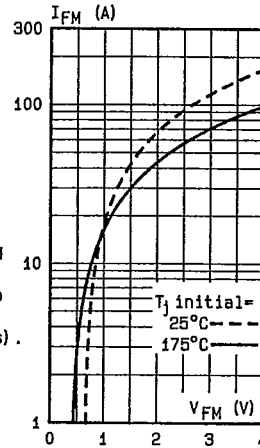


Fig. 9 - Capacitance versus reverse applied voltage for unidirectional types (typical values).

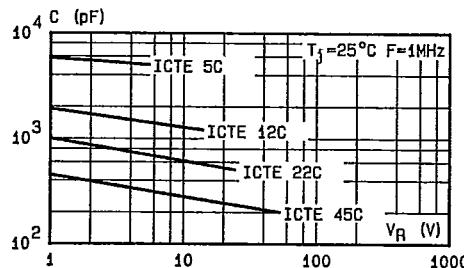


Fig. 10 - Capacitance versus reverse applied voltage for bidirectional types (typical values).