THOMSON-CSF
DIVISION SEMICONDUCTEURS DISCRETS

ESM 750
ESM 750 A

SUPERSWITCH

NPN HIGH VOLTAGE SWITCHING TRANSITORS

TRANSISTORS NPN HAUTE TENSION DE COMMUTATION

SUPERSWITCH

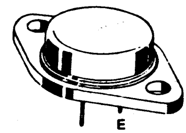
VERY HIGH VOLTAGE , HIGH SPEED TRANSISTOR SUITED FOR:
- THE 380/440 V MAINS
- THE PARALLEL AND DARLINGTON CONFIGURATIONS
- DC/DC AND DC/AC INVERTERS
- MOTOR CONTROL

Data sheet tailored for switching applications

- Key parameters characterized at 100°C
- High blocking capability - 1000 V
- Information for parallel mounting
- Information for use in darlington configuration

	ESM 750	ESM 750 A
V_{CEOsus}	600 V	700 V
V_{CEX}	900 V	1000 V
I_{Csat}	6 A	6 A
I_{CSM}	45 A	45 A
t_f (100 °C) max	0,6 μs	0,6 μs

Case
Boitier TO 3



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

			ESM 750	ESM 750 A	
Collector-emitter voltage *Tension collecteur-émetteur*		V_{CEO}	600	700	V
Collector-emitter voltage *Tension collecteur-émetteur*	$V_{BE} = -3V$	V_{CEX}	900	1000	V
Emitter-base voltage *Tension émetteur-base*		V_{EBO}	7	7	V
Collector current *Courant collecteur*	$t_p \leq 10$ ms	I_C I_{CM}	12 25	12 25	A
Base current *Courant base*	$t_p \leq 10$ ms	I_B I_{BM}	4 10	4 10	A
Power dissipation *Dissipation de puissance*	T_{case} 25 °C	P_{tot}	150	150	W
Junction temperature *Température de jonction*	max	T_j	175	175	°C

Junction-case thermal resistance *Résistance thermique jonction-boitier*	max	$R_{th(j-c)}$	1	1	°C/W

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

THOMSON-CSF
COMPOSANTS

ELECTRICAL CHARACTERISTICS – CARACTÉRISTIQUES ÉLECTRIQUES **

SYMBOLS	Min	Typ	Max	UNIT		TEST CONDITIONS – CONDITIONS DE MESURE
OFF CHARACTERISTICS – CARACTÉRISTIQUES A L'ÉTAT BLOQUÉ						
V_{CEOsus}	600			V	ESM 750	$I_B = 0$, $I_C = 0,2$ A, L = 25 mH
	700				ESM 750 A	
$V_{(BR)EBO}$	7			V		$I_C = 0$, $I_B =$ 50 mA
I_{CEX}			0,3	mA		$T_{case} = 25$ °C $V_{CE} = V_{CEX}$, $V_{BE} = -3$ V
			2			$T_{case} = 125$ °C
I_{CER}			0,5	mA		$T_{case} = 25$ °C $V_{CE} = V_{CEX}$, $R_{BE} \leqslant 10\ \Omega$
			4			$T_{case} = 125$ °C
I_{EBO}			1	mA		$I_C = 0$, $V_{EB} = 5$ V
ON CHARACTERISTICS – CARACTÉRISTIQUES A L'ÉTAT CONDUCTEUR						
V_{CEsat}*			1,8	V		$I_C =$ 6 A, $I_B = 1,5$ A $T_{case} = 100$ °C
			2,5			$I_C = 10$ A, $I_B = 5$ A
V_{BEsat}*			2	V		$I_C =$ 6 A, $I_B = 1,5$ A
DYNAMIC CHARACTERISTICS – CARACTÉRISTIQUES DYNAMIQUES						
f_T		5		MHz		f = 1 MHz, $I_C = 1$ A, $V_{CE} = 10$ V
C_{22b}		230		pF		f = 1 MHz, $V_{CE} = 10$ V
SWITCHING CHARACTERISTICS – CARACTÉRISTIQUES DE COMMUTATION						
Resistive load – Charge résistive						
t_{on}		0,4	0,8	µs		$V_{CC} = 300$ V, $I_C =$ 6 A, $I_{B1} = -I_{B2} = 1,5$ A
t_s		2,2	4			
t_f		0,35	0,7			
Inductive load – Charge inductive						
t_s		3,5		µs		$T_j = 25$ °C $V_{CC} = 300$ V, $I_C =$ 6 A, $L_B =$ 3 µH, $I_{Bend} = 1,5$ A
t_f		0,15				
t_s		4,2	7			$T_j = 100$ °C $V_B = -5$ V
t_f		0,33	0,6			

* Pulse - Impulsions $t_p = 300$ µs δ $\leqslant 2$ %   ** $T_{case} = 25$ °C Unless otherwise stated - Sauf indications contraires

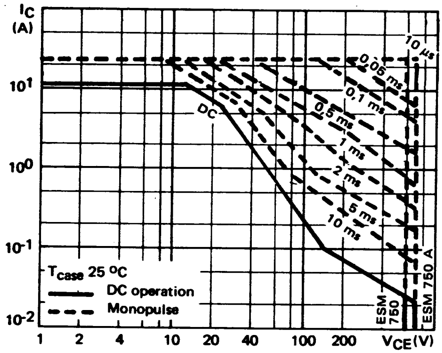


FIGURE 1 : DC and pulse area

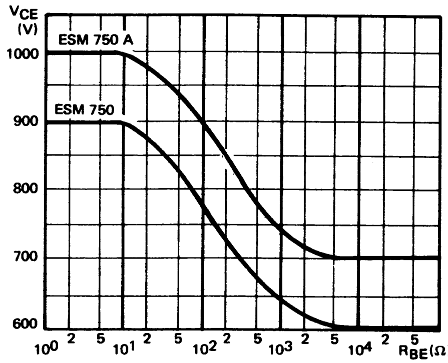


FIGURE 2 : Collector-emitter voltage vs base-emitter resistance

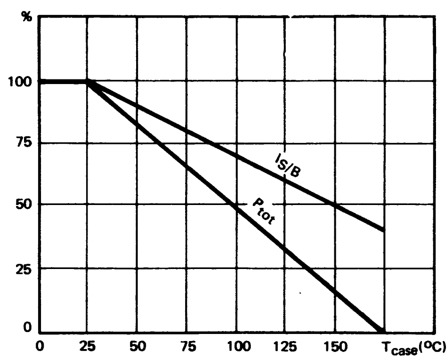


FIGURE 3 : Power and $I_{S/B}$ derating vs case temperature

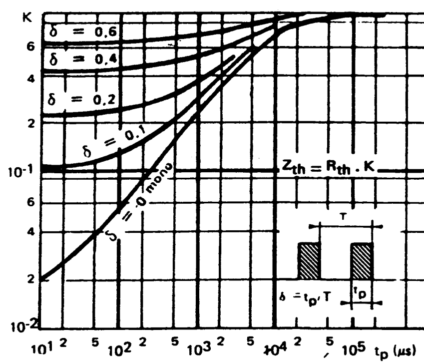


FIGURE 4 : Transient thermal response

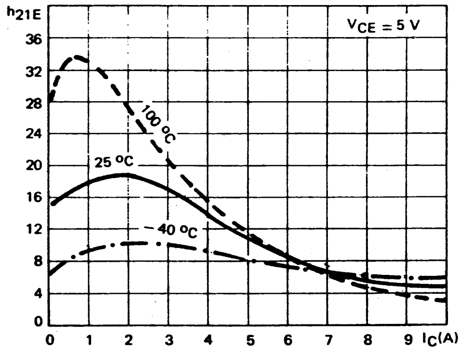


FIGURE 6 : DC current gain

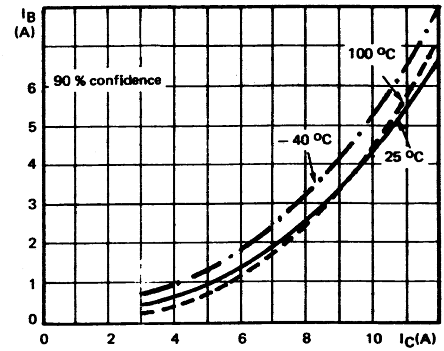


FIGURE 7 : Minimum base current to saturate the transistor

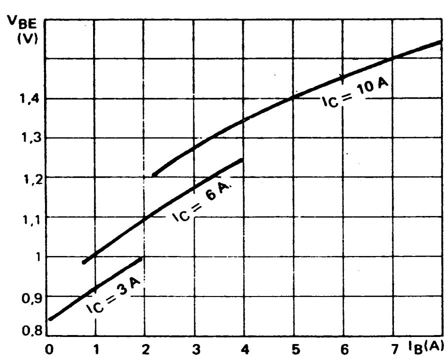


FIGURE 8 : Base characteristics

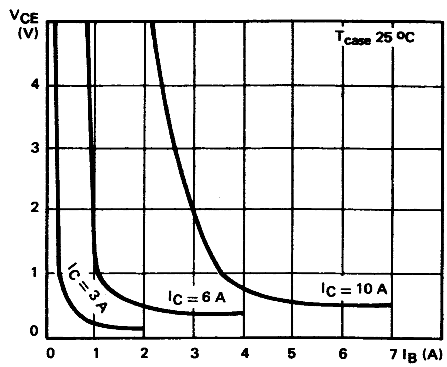


FIGURE 9 : Collector saturation region

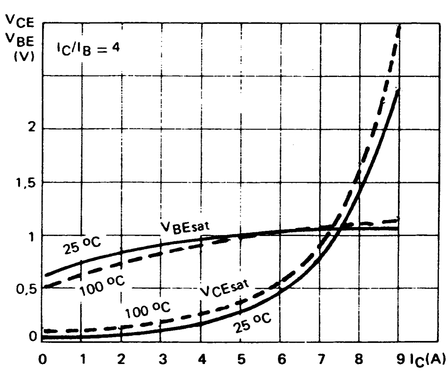


FIGURE 10 : Saturation voltage

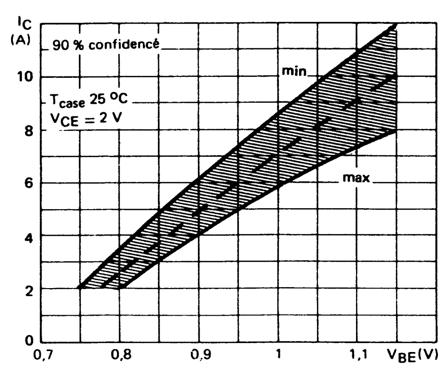
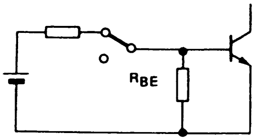
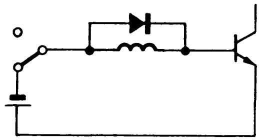


FIGURE 11 : Collector current spread vs base-emitter voltage

SWITCHING OPERATING AND OVERLOAD AREAS



TRANSISTOR FORWARD BIASED
- During the turn on
- During the turn off without negative base-emitter voltage and $R_{BE} \leqslant 100\ \Omega$



TRANSISTOR REVERSE BIASED
- During the turn off with negative base-emitter voltage

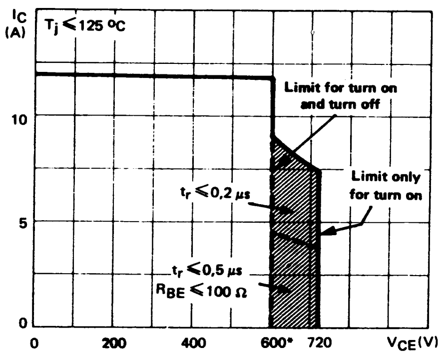


FIGURE 12 : Forward biased safe operating area (FBSOA)

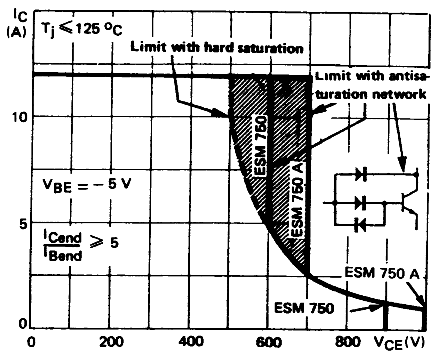


FIGURE 13: Reverse biased safe operating area (RBSOA)

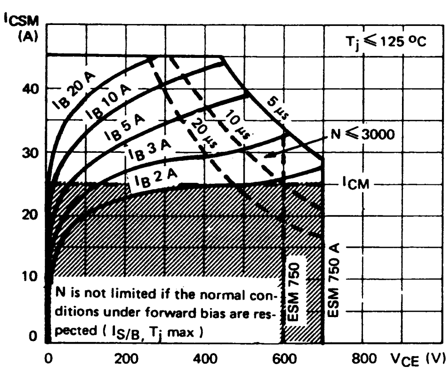


FIGURE 14 : Forward biased accidental overload area (FBAOA)

* ESM 750 A = 700 V

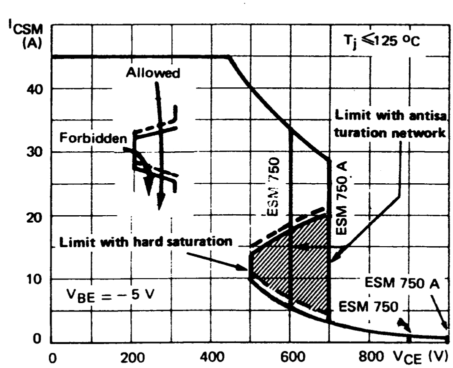


FIGURE 15 :Reverse biased accidental overload area (RBAOA)

Figure 12 : The hatched zone can only be used for turn on.

Figures 13 and 15 : Switch off starting from the quasi saturated state ($V_{CE} \geqslant$ 1'5 V) allows to extend the RBSOA and the RBAOA to the hatched zone.

Figures 14 and 15 : High accidental surge currents ($I > I_{CM}$) are allowed if they are non repetitive and applied less than 3000 times during the component life.

Figure 14 : The Kellog network (heavy point) allows the calculation of the maximum value of the short-circuit current for a given base current I_B (90 % confidence).

Figure 15 : After the accidental overload current, the RBAOA has to be used for the turn off. As in traffic regulation one is allowed to cross the broken line before the continuous line. One is forbidden to cross the single continuous line.

Figure 12 : *La zone hachurée ne doit être utilisée que pour la mise en conduction.*

Figures 13 et 15 : *Le blocage à partir de l'état quasi-saturé ($V_{CE} \geqslant$ 1,5 V) permet d'étendre les aires de fonctionnement et de surcharge en inverse jusqu'à la zone hachurée.*

Figures 14 et 15 : *De forts courants de surcharge ($I > I_{CM}$) sont permis s'ils sont non répétitifs et appliqués moins de 3000 fois dans la vie du composant.*

Figure 14 : *Le réseau de Kellog (trait gras) permet le calcul de la valeur maximale du courant de court-circuit pour un courant de base donné I_B (90 % de confiance).*

Figure 15 : *Après le passage du courant de surcharge accidentelle on doit utiliser l'aire de surcharge accidentelle en polarisation inverse pour l'ouverture. Il est permis de traverser la ligne continue à condition de traverser d'abord la ligne pointillée.*

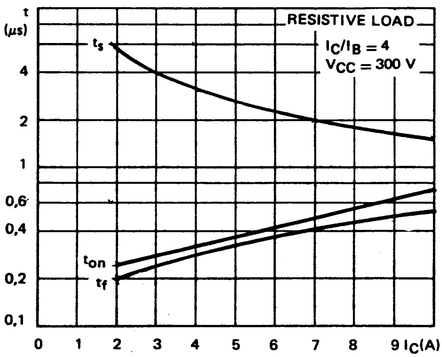


FIGURE 16 : Switching times vs collector current (resistive load)

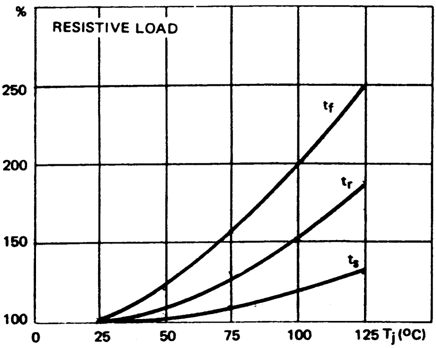


FIGURE 17 : Switching times vs junction temperature (resistive load)

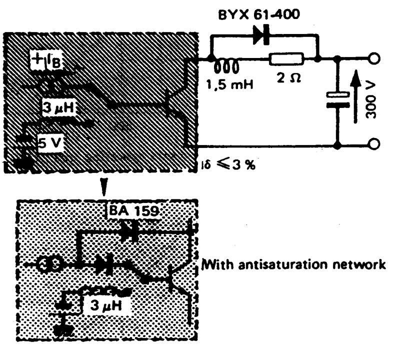


FIGURE 18 : Switching times test circuit on inductive load (with and without antisaturation network)

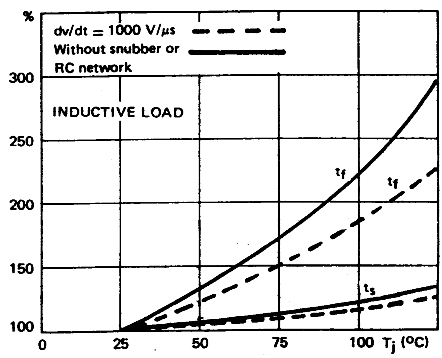


FIGURE 19 : Switching times vs junction temperature (inductive load)

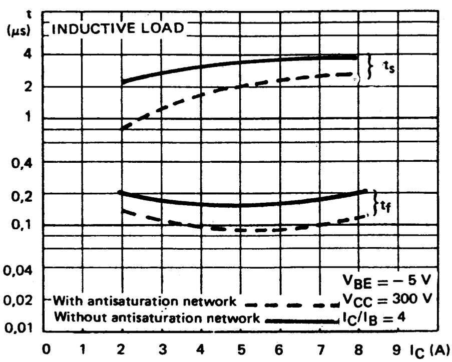


FIGURE 20 : Switching times vs collector current (with and without antisaturation network)

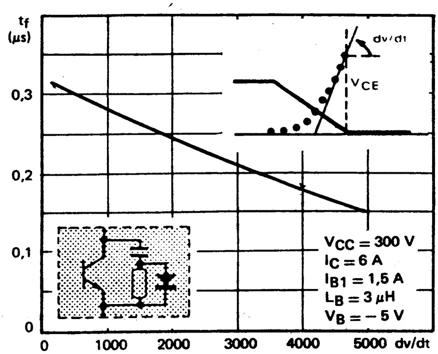


FIGURE 21 : Fall times vs reapplied voltage slope

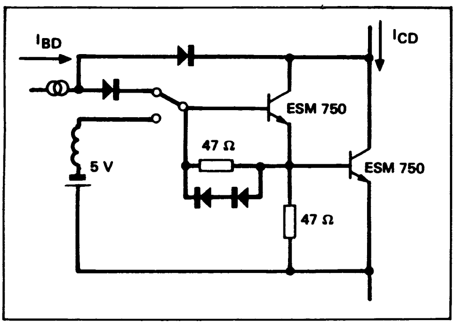
applications

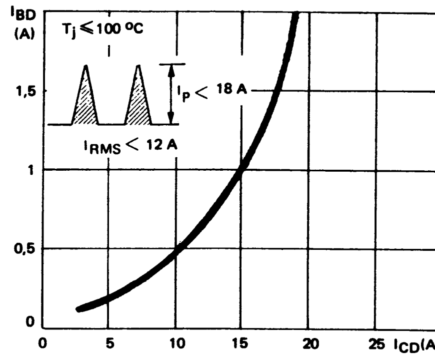
The ESM 750 is designed for high voltage (380/440 V mains) and high current applications.

$I_{Csat} = 6\ A$ P_S switchable power = $V_{CEO} \cdot I_{Csat} = 4{,}2\ KW$

To increase its power switching capability, it can be used in discrete Darlington configurations.

EXAMPLE 1 :



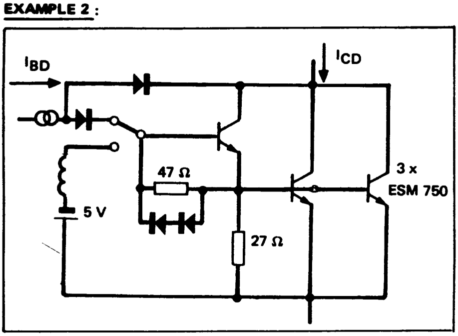


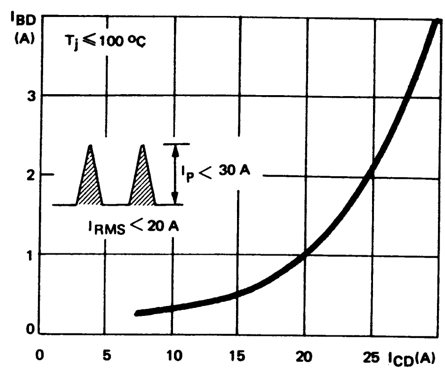
Minimum base current I_{BD} to driver the discrete Darlington

In this configuration the discrete Darlington can switch:

$I_{CD} = 15\ A$	with	$I_{BD} = 1\ A$
$I_{CD} = 10\ A$	with	$I_{BD} = 0{,}5\ A$

EXAMPLE 2 :





Minimum base current I_{BD} to driver the discrete Darlington

In this configuration the discrete Darlington can switch :

$I_{CD} = 20\ A$	with	$I_{BD} = 1\ A$
$I_{CD} = 10\ A$	with	$I_{BD} = 0{,}3\ A$

ESM 752, (V) - ESM 752 A, (V)

NPN HIGH VOLTAGE SWITCHING TRANSISTORS
TRANSISTORS NPN HAUTE TENSION DE COMMUTATION

SUPERSWITCH

VERY HIGH VOLTAGE, HIGH SPEED TRANSISTORS SUITED FOR :

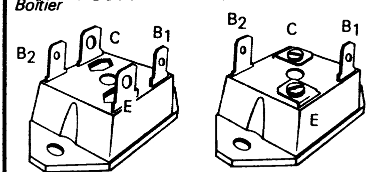
- THE 380/440 V MAINS
- THE PARALLEL AND DARLINGTON CONFIGURATIONS
- DC/DC AND DC/AC CONVERTERS
- MOTOR CONTROL

Data sheet tailored for switching applications

- ISOTOP : isolated collector package
- Key parameters characterized at 100°C
- High blocking capability - 1000 V
- Information for parallel mounting
- Information for use in darlington configuration

	ESM 752,(V)	ESM 752 A, (V)
$V_{CEO(sus)}$	600 V	700 V
V_{CEV}	900 V	1000 V
I_{Csat}	12 A	
I_{CSM}	90 A	
t_f (100°C) (max)	600 ns	

Case *Boîtier* **: ISOTOP**



ESM 752-ESM 752A CB-285 **ESM 752 V-ESM 752 AV CB-416**

Isolation voltage : 2,5 kV(RMS)

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

$T_{case} = 25°C$

			ESM 752,(V)	ESM 752 A, (V)	Units
Collector-emitter voltage *Tension collecteur-émetteur*		V_{CEO}	600	700	V
Collector-emitter voltage *Tension collecteur-émetteur*	$V_{BE} = -3$ V	V_{CEV}	900	1000	V
Emitter-base voltage *Tension émetteur-base*		V_{EBO}	7		V
Collector current *Courant collecteur*	$t_p \leqslant 10$ ms	I_C I_{CM}	24 50		A
Base current *Courant base*	$t_p \leqslant 10$ ms	I_B I_{BM}	8 20		A
Power dissipation *Dissipation de puissance*		P_{tot}	150		W
Junction temperature *Température de jonction*	max	T_j	150		°C

Junction-case thermal resistance *Résistance thermique jonction-boîtier*	max.	$R_{th(j-c)}$	0,83	°C/W

October 1982 - 1/7

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

ELECTRICAL CHARACTERISTICS - *CARACTÉRISTIQUES ÉLECTRIQUES***

SYMBOLS	Min.	Typ.	Max.	UNITS	TEST CONDITIONS - *CONDITIONS DE MESURE*
OFF CHARACTERISTICS - *CARACTÉRISTIQUES A L'ÉTAT BLOQUÉ*					
$V_{CEO\ (sus)}$	600			V	ESM 752, (V) } $I_B = 0$, $I_C = 0{,}2$ A, L = 25mH
	700			V	ESM 752 A, (V) } $I_B = 0$, $I_C = 0{,}2$ A, L = 25mH
$V_{(BR)EBO}$	7			V	$I_C = 0$, $I_B = 0{,}1$ A
I_{CEV}			0,4	mA	} $V_{CE} = V_{CEV}$, $= V_{BE} = -3$ V
			4	mA	$T_{case} = 125°C$ } $V_{CE} = V_{CEV}$, $= V_{BE} = -3$ V
I_{CER}			1	mA	} $V_{CE} = V_{CEV}$, $R_{BE} \leqslant 5\Omega$
			8	mA	$T_{case} = 125°C$ } $V_{CE} = V_{CEV}$, $R_{BE} \leqslant 5\Omega$
I_{EBO}			2	mA	$I_C = 0$, $V_{EB} = 5$ V
ON CHARACTERISTICS - *CARACTÉRISTIQUES A L'ÉTAT CONDUCTEUR*					
V_{CEsat}*			1,8	V	$I_C = 12$ A, $I_B = 3$ A $T_{case} = 100°C$
			2,5	V	$I_C = 20$ A, $I_B = 10$ A
V_{BEsat}*			2	V	$I_C = 12$ A, $I_B = 3$ A
DYNAMIC CHARACTERISTICS - *CARACTÉRISTIQUES DYNAMIQUES*					
f_T		5		MHz	f = 1 MHz, $I_C = 1$ A, $V_{CE} = 10$ V
C_{22b}		460		pF	f = 1 MHz, $V_{CE} = 10$ V
SWITCHING CHARACTERISTICS - *CARACTÉRISTIQUES DE COMMUTATION*					
Résistive load - *Charge résistive*					
t_{on}		0,4	0,8	µs	$V_{CC} = 300$ V, $I_C = 12$ A, $I_{B1} = -I_{B2} = 3$ A
t_s		2,2	4	µs	$V_{CC} = 300$ V, $I_C = 12$ A, $I_{B1} = -I_{B2} = 3$ A
t_f		0,35	0,7	µs	$V_{CC} = 300$ V, $I_C = 12$ A, $I_{B1} = -I_{B2} = 3$ A
Inductive load - *Charge inductive*					
t_s		3,5		µs	} $V_{CC} = 300$ V, $I_C = 12$ A, $L_B = 1{,}5\mu$H, $I_{Bend} = 3$ A, $V_B = -5$ V
t_f		0,15		µs	} $V_{CC} = 300$ V, $I_C = 12$ A, $L_B = 1{,}5\mu$H, $I_{Bend} = 3$ A, $V_B = -5$ V
t_s		4,2	7	µs	$T_j = 100°C$ } $V_{CC} = 300$ V, $I_C = 12$ A, $L_B = 1{,}5\mu$H, $I_{Bend} = 3$ A, $V_B = -5$ V
t_f		0,33	0,6	µs	$T_j = 100°C$ } $V_{CC} = 300$ V, $I_C = 12$ A, $L_B = 1{,}5\mu$H, $I_{Bend} = 3$ A, $V_B = -5$ V

*Pulse - *Impulsions* $t_p = 300\,\mu s$, $\delta \leqslant 2$ % - **$T_{case} = 25°C$ Unless otherwise stated - *Sauf indications contraires*

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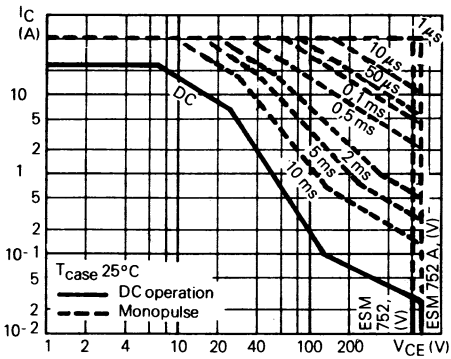


FIGURE 1 : DC and pulse area

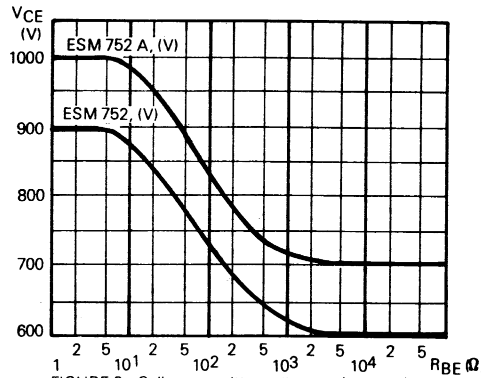


FIGURE 2 : Collector-emitter voltage vs base-emitter resistance

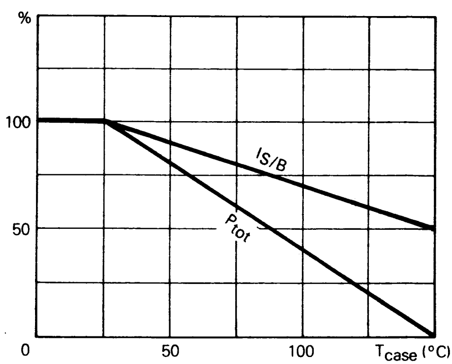


FIGURE 3 : Power and $I_{S/B}$ derating vs case temperature

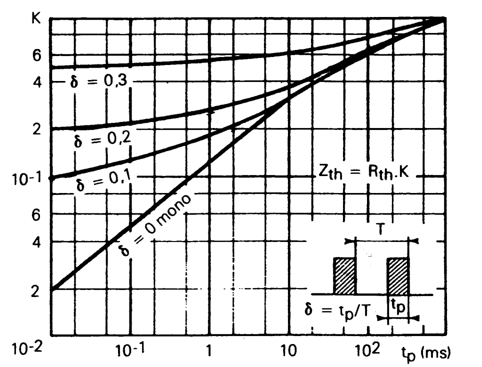
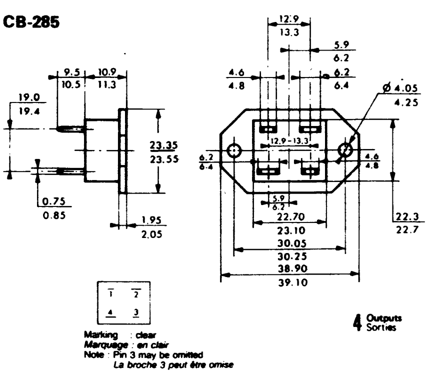


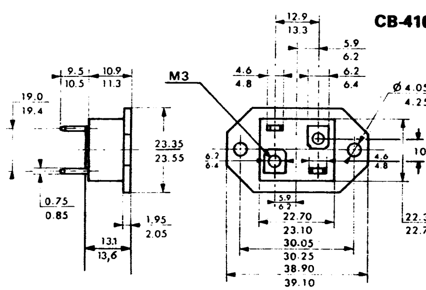
FIGURE 4 : Transient thermal response

CASE OUTLINES

CB-285



CB-416



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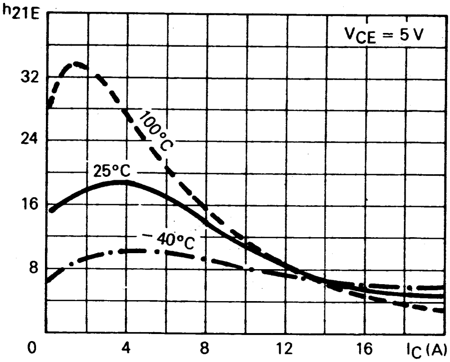


FIGURE 6 : DC curent gain

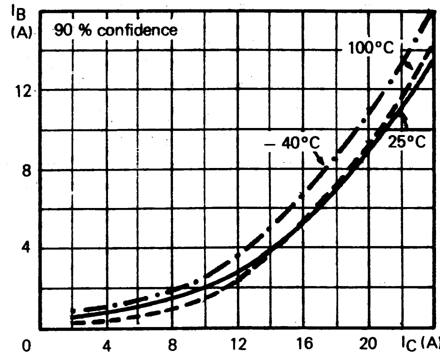


FIGURE 7 : Minimum base current to saturate the transistor

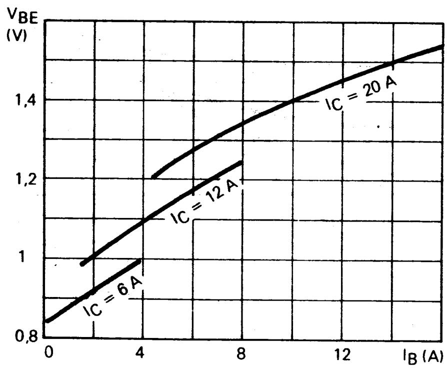


FIGURE 8 : Base characteristics

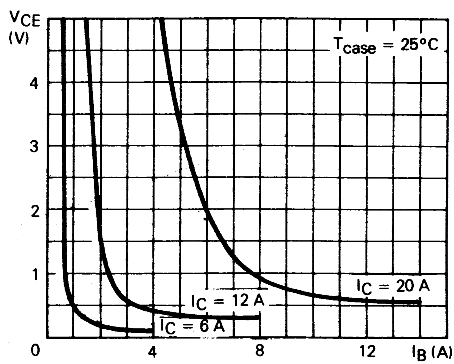


FIGURE 9 : Collector saturation region

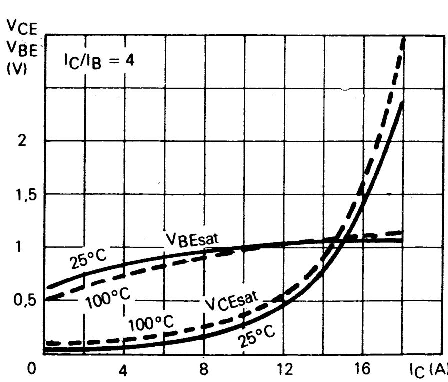


FIGURE 10 : Saturation voltage

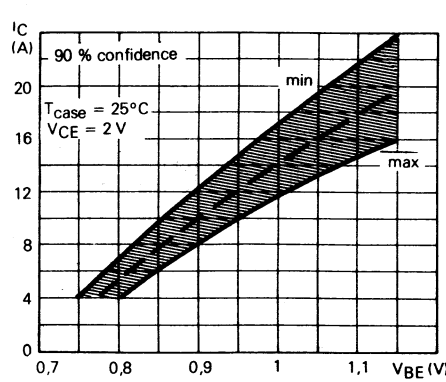
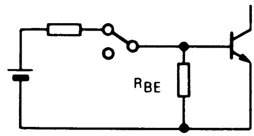
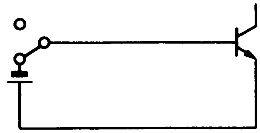


FIGURE 11 : Collector current spread vs base-emitter voltage

SWITCHING OPERATING OVERLOAD AREAS



TRANSISTOR FORWARD BIASED
- **During the turn-on**
- **During the tur-off without negative base-emitter voltage and $R_{BE} \geq 50\,\Omega$**



TRANSISTOR REVERSE BIASED
- **During the turn-off with negative base-emitter voltage**

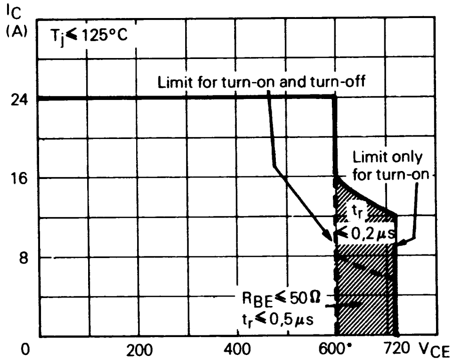


FIGURE 12 : Forward biased safe operating area (V) (FBSOA)

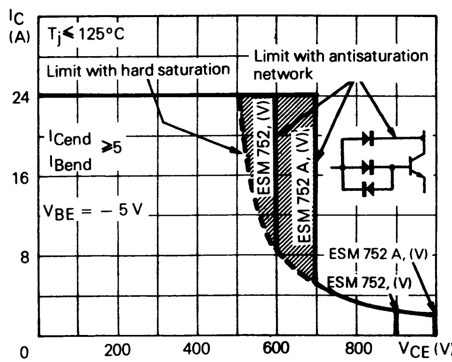


FIGURE 13 : Reverse biased safe operating (RBSOA)

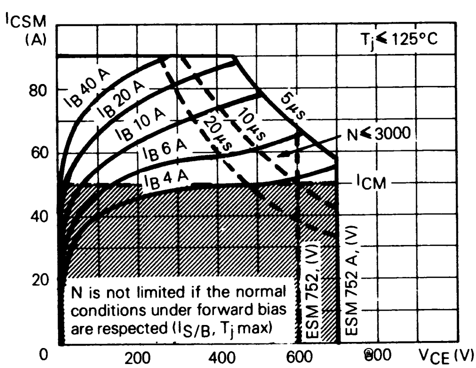


FIGURE 14 : Forward biased accidental overload area (FBAOA)

* ESM 752 A, (V) : 700 V

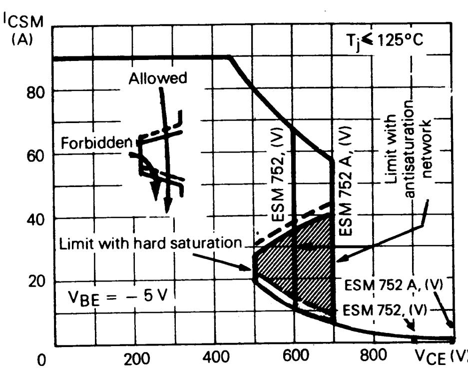


FIGURE 15 : Reverse biased accidental overload area (RBAOA)

Figure 12 : The hatched zone can only be used for turn on.

Figures 13 and 15 : Switch off starting from the quasi saturated state ($V_{CE} \geq 1{,}5$ V) allows to extend the RBSOA and the RBAOA to the hatched zone.

Figures 14 and 15 : High accidental surge current ($I > I_{CM}$) are allowed if they are non repetitive and applied less than 3000 times during the component life.

Figure 14 : The Kellog network (heavy point) allows the calculation of the maximum value of the short-circuit current for a given base current I_B (90 % confidence).

Figure 15 : After the accidental overload current, the RBAOA has to be used for the turn off. As in traffic regulation one is allowed to cross the broken line before the continuous line. One is forbidden to cross the single continuous line.

Figure 12 : *La zone hachurée ne doit être utilisée que pour la mise en conduction.*

Figures 13 et 15 : *Le blocage à partir de l'état quasi-saturé ($V_{CE} \geq 1{,}5$ V) permet d'étendre les aires de fonctionnement et de surcharge en inverse jusqu'à la zone hachurée.*

Figures 14 et 15 : *De forts courants de surcharge ($I > I_{CM}$) sont permis s'ils sont non répétitifs et appliqués moins de 3000 fois dans la vie du composant.*

Figure 14 : *Le réseau de Kellog (trait gras) permet le calcul de la valeur maximale du courant de court-circuit pour un courant de base donné I_B (90 % de confiance).*

Figure 15 : *Après le passage du courant de surcharge accidentelle on doit utiliser l'aire de surcharge accidentelle en polarisation inverse pour l'ouverture. Il est permis de traverser la ligne continue à condition de traverser d'abord la ligne pointillée.*

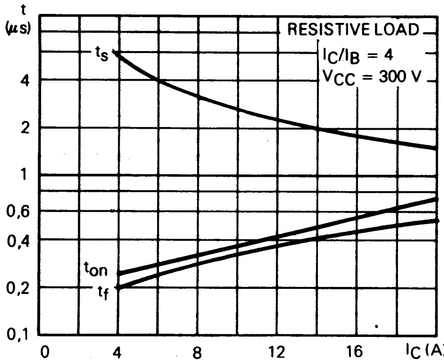


FIGURE 16 : Switching times vs collector current (resistive load)

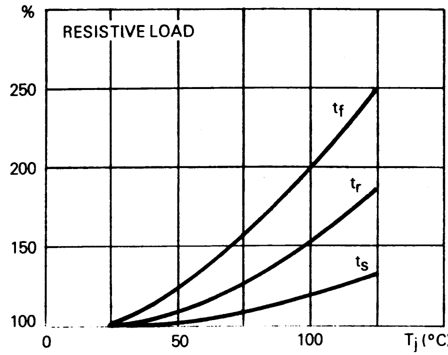


FIGURE 17 : Switching times vs junction temperature (resistive load)

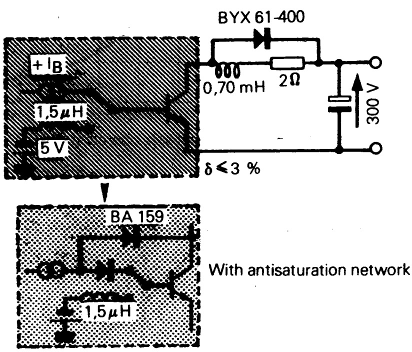


FIGURE 18 : Switching times test circuit on inductive load (with and without antisaturation network)

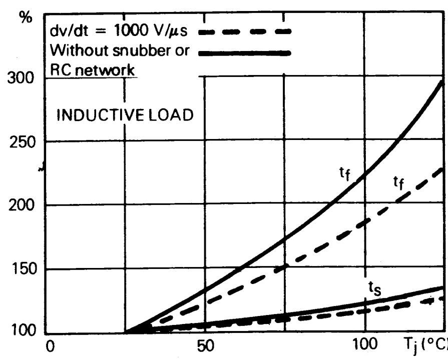


FIGURE 19 : Switching times vs junction temperature (inductive load)

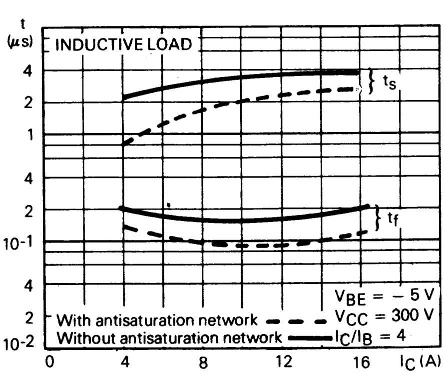


FIGURE 20 : Switching times vs collector current (with and without antisaturation network)

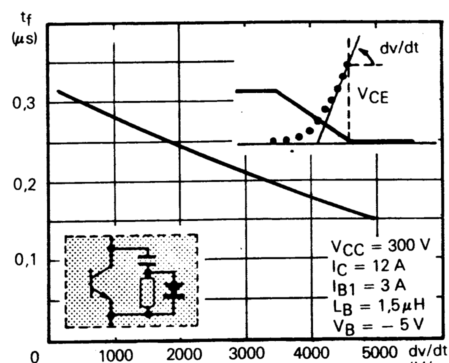


FIGURE 21 : Fall times vs reapplied voltage slope

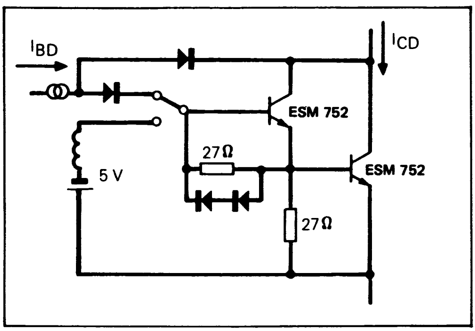
applications

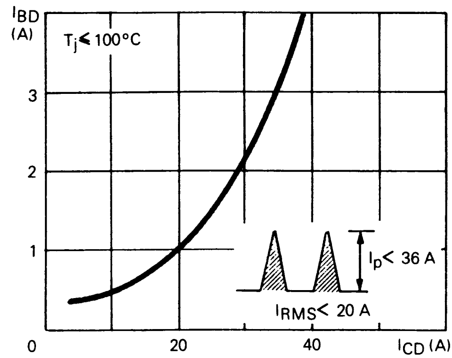
The ESM 752 is designed for high voltage (380/440 V mains) and high current applications.

I_{Csat} = 12 A P_S switchable power = $V_{CEO} \cdot I_{Csat}$ = 8,4 kW

To increase its power switching capability, it can be used in discrete Darlington configurations.

EXAMPLE 1 :

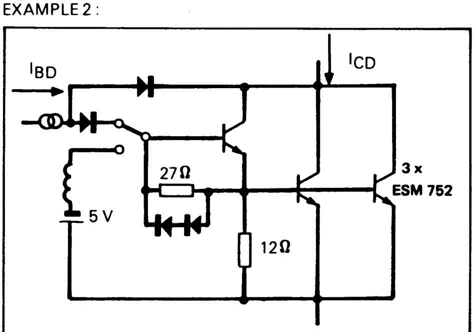


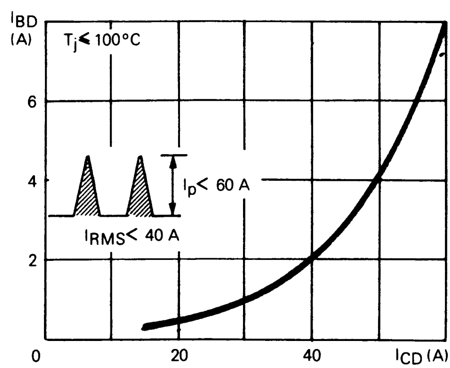


In this configuration the discrete Darlington can switch :

I_{CD} = 30 A	with	I_{BD} = 2 A
I_{CD} = 20 A	with	I_{BD} = 1 A

EXAMPLE 2 :





In this configuration the discrete Darlington can switch :

I_{CD} = 40 A	with	I_{BD} = 2 A
I_{CD} = 20 A	with	I_{BD} = 0,5 A

SUPERSWITCH

ESM 753 ,(V)
ESM 753 A ,(V)

NPN HIGH VOLTAGE SWITCHING DARLINGTON

DARLINGTON NPN HAUTE TENSION DE COMMUTATION

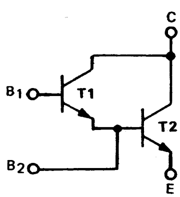
ADVANCE INFORMATION

SUPERSWITCH

HIGH VOLTAGE , HIGH CURRENT DARLINGTONS ESPECIALLY DESIGNED FOR FAST POWER SWITCHING IN BRIDGE CONVERTERS

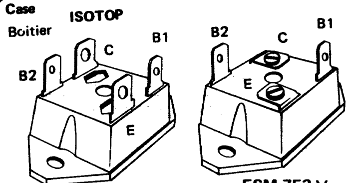
NO PARASITIC COLLECTOR-EMITTER DIODE . BASE OF OUTPUT STAGE AND OF DRIVER STAGE SEPARATELY CONNECTABLE.

WIDE ACCIDENTAL OVERLOAD AREA FOR EASY SHORT-CIRCUIT PROTECTION.



	ESM 753, (V)	ESM 753 A, (V)
V_{CEW}	600 V	700 V
V_{CEV}	900 V	1000 V
I_{Csat}	12 A	12 A
t_f (max) (100°C)	0,5 µs	0,5 µs

Case
Boitier
ISOTOP



CB.285 ESM 753 ESM 753 A

ESM 753 V ESM 753 A V CB. 416

Isolation voltage 2,5 kV_{RMS}

ABSOLUTE RATINGS (LIMITING VALUES) VALEURS LIMITES ABSOLUES D'UTILISATION			ESM 753,(V)	ESM 753 A,(V)	
Collector-emitter voltage *Tension collecteur-émetteur*		V_{CEO}	600	700	V
Collector-emitter voltage *Tension collecteur-émetteur*	$V_{BE} = -5$ V	V_{CEV}	900	1000	V
Emitter-base voltage *Tension émetteur-base*		V_{EBO}	12	12	V
Collector current *Courant collecteur*	$t_p \leqslant 10$ ms	I_C I_{CM}	18 30	18 30	A
Base current *Courant base*	$t_p \leqslant 10$ ms	I_B I_{BM}	4 10	4 10	A
Power dissipation *Dissipation de puissance*	T_{case} 25 °C	P_{tot}	125	125	W
Junction temperature *Température de jonction*		T_j	– 40 + 150	– 40 + 150	°C

Junction-case thermal resistance *Résistance thermique jonction boitier*	max	$R_{th(j-c)}$	1	1	°C/W

June 1982 1/3

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

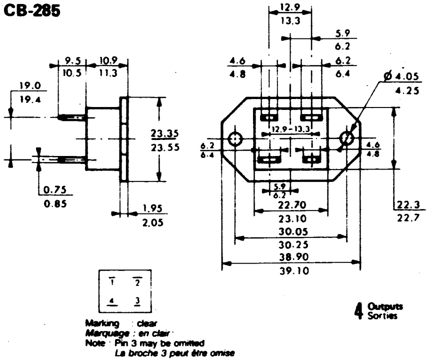
ELECTRICAL CHARACTERISTICS - CARACTÉRISTIQUES ÉLECTRIQUES **

SYMBOLS	Min	Typ	Max	UNITS	TEST CONDITIONS - CONDITIONS DE MESURE
OFF CHARACTÉRISTICS - CARACTÉRISTIQUES A L'ÉTAT BLOQUÉ					
V_{CEOsus}	600 (ESM 753, (V)) 700 (ESM 753 A, (V))			V	ESM 753, (V) / ESM 753 A, (V) $I_B = 0$, $I_C = 0{,}2$ A, L = 15 mH
$V_{(BR)EBO}$	12			V	$I_C = 0$, $I_B = 5$ mA
I_{CEV}			0,3	mA	T_{case} 25 °C — $V_{CE} = V_{CEV}$, $V_{BE} = -7$ V, R1 = 270 Ω R2 = 100 Ω Diode B1-B2 : PLQ 08
			2	mA	T_{case} 125 °C — $V_{CE} = V_{CEV}$, $V_{BE} = -7$ V, R1 = 270 Ω R2 = 100 Ω Diode B1-B2 : PLQ 08
I_{CER}			0,5	mA	T_{case} 25 °C — $V_{CE} = V_{CEV}$, R1 $\leqslant$ 27 Ω, R2 $\leqslant$ 10 Ω
			4	mA	T_{case} 125 °C — $V_{CE} = V_{CEV}$, R1 $\leqslant$ 27 Ω, R2 $\leqslant$ 10 Ω
I_{EBO} (T2)			1	mA	$I_C = 0$, $V_{BE2} = -7$ V
ON CHARACTÉRISTICS - CARACTÉRISTIQUES A L'ÉTAT CONDUCTEUR					
V_{CEsat}*			2	V	$I_C = 12$ A, $I_B = 1$ A, T_{case} 100 °C
			3,5	V	ESM 753, (V) $I_C = 18$ A, $I_B = 1{,}8$ A ESM 753 A, (V) $I_C = 16$ A, $I_B = 1{,}6$ A
V_{BEsat}*			2,6	V	$I_C = 12$ A, $I_B = 1$ A
SWITCHING CHARACTERISTICS - CARACTÉRISTIQUES DE COMMUTATION					
Resistive load - Charge résistive					
t_{on}			0,8	µs	$V_{CC} = 300$ V, $I_C = 12$ A, $V_{BE} = -7$ V, R1 = 270 Ω, R2 = 100 Ω, Diode B1-B2 : PLQ 08
t_s			4	µs	
t_f			1	µs	
Inductive load - Charge inductive (See figure 1)					
t_s			6,5	µs	$T_j = 100$ °C — $V_{CC} = 300$ V, $I_C = 12$ A, $I_{B1} = 1$ A, $V_{BB} = -7$ V, $L_B = 3$ µH
t_f			0,5	µs	

* Measured with pulses $t_p = 300$ µs $\delta \leqslant 2$ % ** T_{case} 25 °C Unless otherwise stated

CASE OUTLINES

CB-285



CB-416

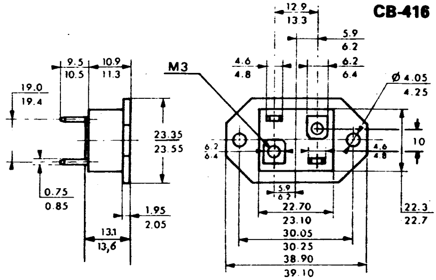


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FIGURE 1 : SWITCHING TIMES MEASUREMENT CIRCUIT FOR INDUCTIVE LOAD

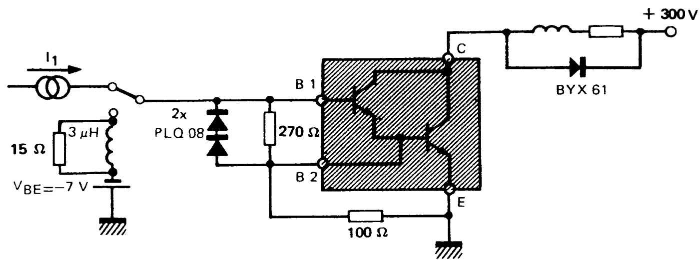
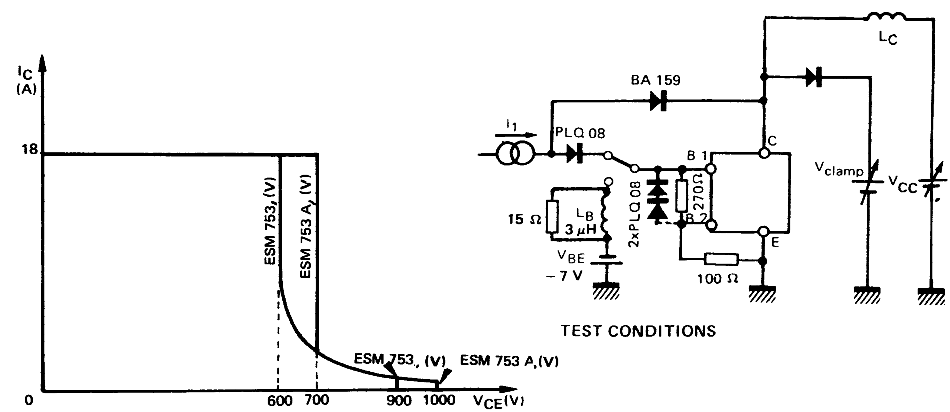


FIGURE 2 : REVERSE BIAS SAFE OPERATING AREA



TEST CONDITIONS