

59C 02167 - D 7-03-21

BYT 60 - 200 → 400, (R)


FAST RECOVERY RECTIFIER
 REDRESSEUR RAPIDE

ADVANCE INFORMATION

FAST RECOVERY RECTIFIER

- Very low reverse recovery time
- Very low switching losses
- Low noise turn-off switching

SUITABLE APPLICATIONS :

- Free wheeling diode in converters and motor control circuits
- Rectifier in S.M.P.S.

 V_{RRM} 200 to 400 V

 $I_{F(AV)}$ 60 A at T_{case} 80°C

 t_{rr}^* < 50 ns

 t_{IRM} < 75 ns } $di/dt = - 240$ A/ μ s

 I_{RM} < 18 A } $T_{(vj)}$ 100°C

 Case
 Boîtier DO-5 (CB-34)

 Type number : Cathode is connected to case
 Type number + suffix R : anode is connected to case

ABSOLUTE RATINGS (LIMITING VALUES) VALEURS LIMITES ABSOLUES D'UTILISATION		BYT 60			
		200, (R)	300, (R)	400, (R)	
Repetitive peak reverse voltage <i>Tension inverse de pointe répétitive</i>	V_{RRM}	200	300	400	V
Non repetitive peak reverse voltage <i>Tension inverse de pointe non répétitive</i>	V_{RSM}	220	330	440	V
Repetitive peak forward current <i>Courant direct de pointe répétitive</i> $t_p < 10 \mu s$	I_{FRM}	800			A
RMS forward current <i>Courant direct efficace</i>	$I_{F(RMS)}$	100			A
Average forward current <i>Courant direct moyen</i> $T_{case} = 80^\circ C$ $\delta = 0,5$	$I_{F(AV)}$	60			A
Surge non repetitive forward current <i>Courant direct de pointe de surcharge</i>	I_{FSM}	800			A
Power dissipation <i>Dissipation de puissance</i> $T_{case} = 80^\circ C$	P	100			W
Junction temperature (max.) <i>Température de jonction maximale</i>	$T_{(vj)}$	- 40 + 150			°C

Junction-case thermal resistance <i>Résistance thermique jonction-boîtier</i> max.	$R_{th(j-c)}$	0,7	°C/W
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* See figure 1

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ELECTRICAL CHARACTERISTICS CARACTÉRISTIQUES ÉLECTRIQUES*

SYMBOLS	Min	Typ	Max	UNITS	TEST CONDITIONS - CONDITIONS DE MESURE
I_R			60	μA	$T_{(vj)} = 100^\circ C$ $V_R = V_{RRM}$
			10	mA	
V_F			1,5	V	$T_{(vj)} = 100^\circ C$ $I_F = 60 A$
			1,4		
t_{rr}			100	ns	$I_F = 1 A, di_F/dt = - 15 A/\mu s, V_R = 30 V$
t_{rr}^{**}			50	ns	$I_F = 0,5 A, I_R = 1 A, \text{measured at } 0,25 A$

** See figure 1

TURN-OFF SWITCHING CHARACTERISTICS WITHOUT SERIES INDUCTANCE

t_{IRM}			75	ns	$di_F/dt = - 240 A/\mu s$ $di_F/dt = - 480 A/\mu s$	$V_{CC} = 200 V$ $I_F = 60 A$ $L_p \leq 0,05 \mu H$ $T_{(vj)} = 100^\circ C$ See figure 2
		50				
I_{RM}			18	A	$di_F/dt = - 240 A/\mu s$ $di_F/dt = - 480 A/\mu s$	
		24				

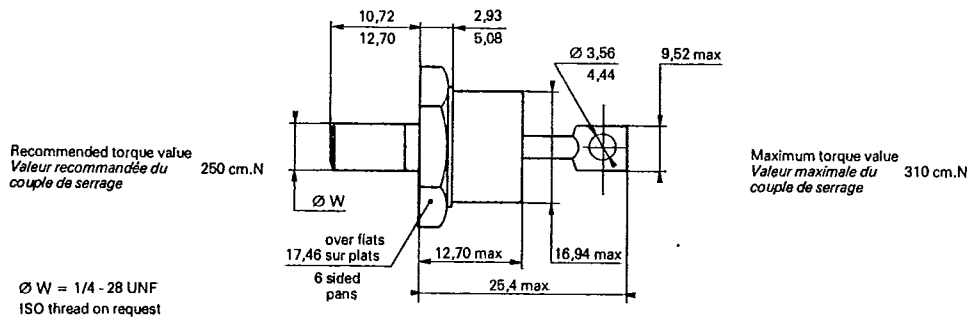
TURN-OFF OVERVOLTAGE COEFFICIENT WITH SERIES INDUCTANCE

$C = \frac{V_{RM}}{V_{CC}}$		3		$V_{CC} = 120 V, I_{F(AV)},$ *** $di_F/dt = - 60 A/\mu s, L_p = 1,3 \mu H,$ $T_{(vj)} = 100^\circ C$ - See figure 3.
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* $T_{(vj)} = 25^\circ C$ unless otherwise stated.

*** Applicable to BYT 60-400 V only

CASE OUTLINE



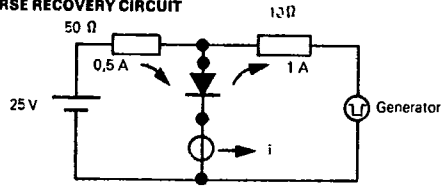
To evaluate the conduction losses use the following equation :

$$V_F = 1,1 + 0,0045 I_F$$

$$P = 1,1 \times I_{F(AV)} + 0,0045 I_F^2 (RMS)$$

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Figure 1: REVERSE RECOVERY CIRCUIT



- Pulse generator
HP 214 A
- i : current probe
Tektronix P 6021
- Oscilloscope $t_r \ll 3$ ns

Figure 2

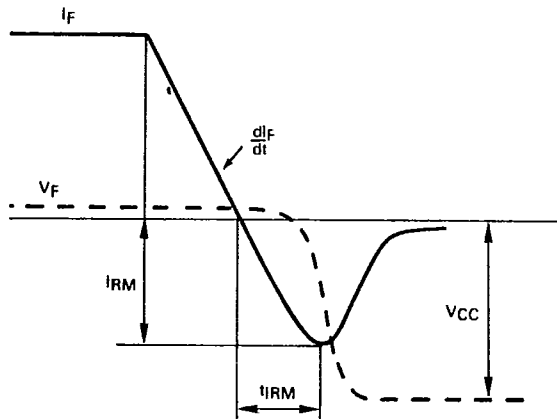
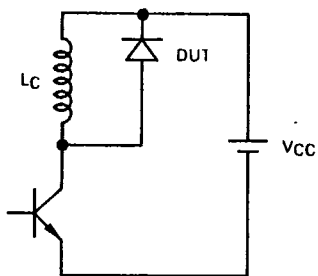
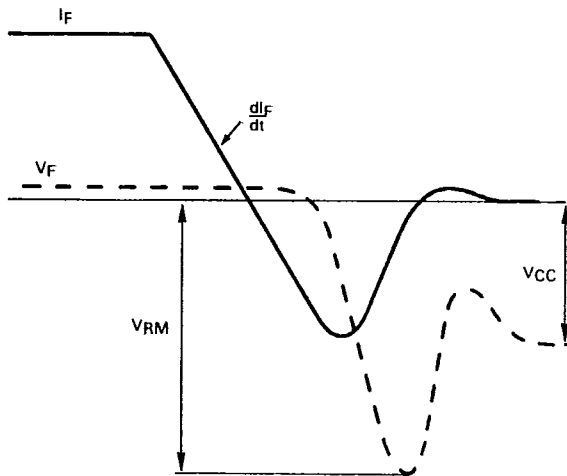
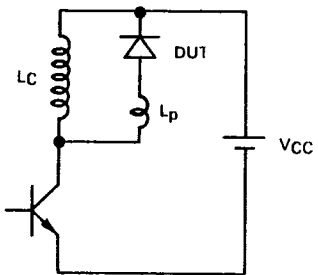


Figure 3



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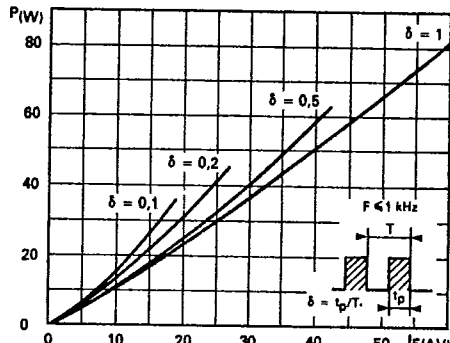


FIGURE 1: Low frequency power losses versus average current.

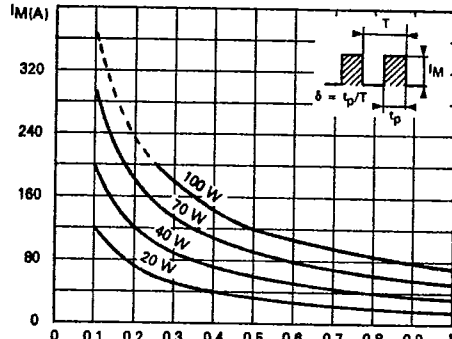


FIGURE 2: Peak current versus form factor.

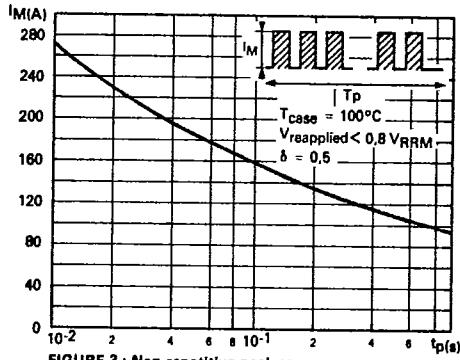


FIGURE 3: Non repetitive peak surge current versus overload duration.

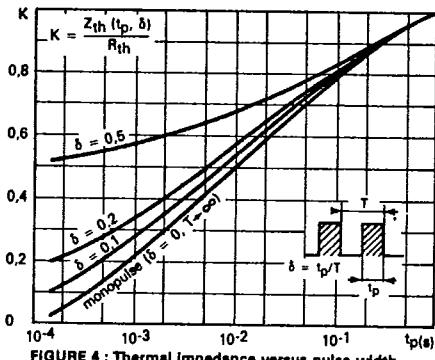


FIGURE 4: Thermal impedance versus pulse width.

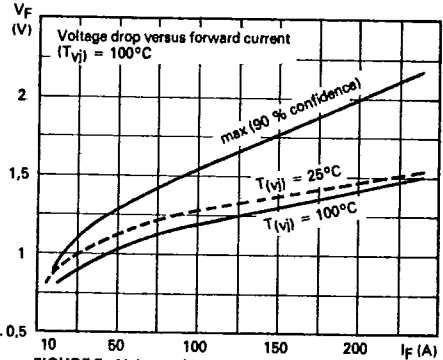


FIGURE 5: Voltage drop versus forward current.

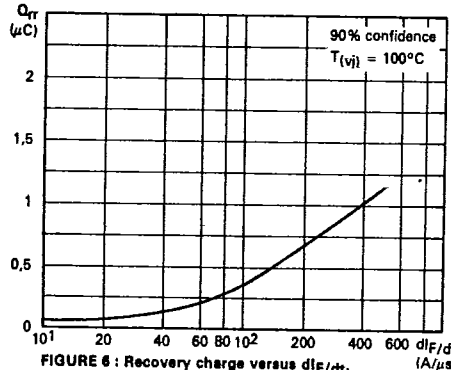


FIGURE 6: Recovery charge versus di/dt.

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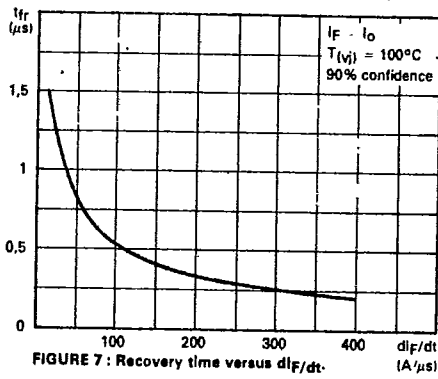


FIGURE 7: Recovery time versus di_F/dt .

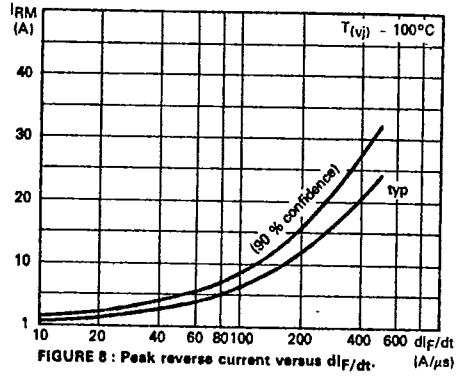


FIGURE 8: Peak reverse current versus di_F/dt .

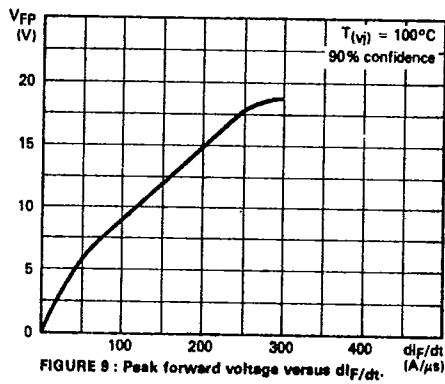


FIGURE 9: Peak forward voltage versus di_F/dt .

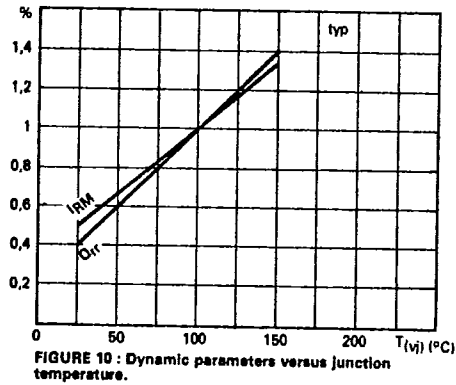


FIGURE 10: Dynamic parameters versus junction temperature.