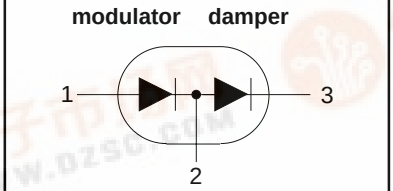
Damper-Modulator fast, high-voltage

BYM357DX

FEATURES

- Low forward volt drop
- Fast switching
- Soft recovery characteristic
- High thermal cycling performance
- Isolated mounting tab

SYMBOL



QUICK REFERENCE DATA

DAMPER	MODULATOR
V_R=1500 V	V_R=600 V
$V_F \leq 1.3$ V	$V_F \leq 1.03$ V
$I_{F(RMS)}$ =15.7 A	$I_{F(peak)}$ = 7 A
$I_{FSM} \leq 60$ A	$I_{FSM} \leq 70$ A
$t_{rr} \leq 300$ ns	$t_{rr} \leq 60$ ns

GENERAL DESCRIPTION

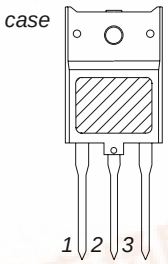
Combined damper and modulator diodes in an isolated plastic envelope for horizontal deflection in colour TV and PC monitors.
The BYM357DX contains diodes with performance characteristics designed specifically for applications from 16kHz to 70kHz

The BYM357DX series is supplied in the conventional leaded SOT399 package.

PINNING

PIN	DESCRIPTION
1	modulator anode.
2	common anode/cathode
3	damper cathode

SOT399



LIMITING VALUES

T_j = 25 ˚C unless otherwise stated

			DAMPER		MODULATOR		
SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	MIN	MAX	UNIT
V_{RSM}	Peak non-repetitive reverse voltage.		-	1500	-	600	V
V_{RRM}	Peak repetitive reverse voltage		-	1500	-	600	V
V_{RWM}	Crest working reverse voltage		-	1300	-	600	V
$I_{F(peak)}$	Peak forward current	31-70kHz monitor	-	7	-	7	A
$I_{F(RMS)}$	RMS forward current	sinusoidal;a=1.57	-	15.7	-	14.1	A
I_{FSM}	Peak non-repetitive forward current	t = 10ms t = 8.3 ms sinusoidal; with reapplied $V_{RWM(MAX)}$	- -	60 66	- -	70 77	A A
T_{stg}	Storage temperature		-40	150	-40	150	˚C
T_J	Operating junction temperature		-	150	-	150	˚C

ISOLATION LIMITING VALUE & CHARACTERISTIC

T_{hs} = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{isol}	Repetitive peak voltage from all three terminals to external heatsink	R.H. ≤ 65 % ; clean and dustfree	-	-	2500	V
C_{isol}	Capacitance from T2 to external heatsink	f = 1 MHz	-	22	-	pF

THERMAL RESISTANCES

			DAMPER		MODULATOR		
SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}hs}$	Thermal resistance junction to heatsink	with heatsink compound	-	3.5	-	4	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	in free air.	32	-	32	-	K/W

STATIC CHARACTERISTICS OF DAMPER

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	TYP	MAX.	UNIT
V_F	Forward voltage	I_F = 6.5 A	1.1	1.45	V
		I_F = 6.5 A; T_j = 125˚C	1.05	1.3	V
I_R	Reverse current	$V_R = V_{RWM}$	10	250	µA
		$V_R = V_{RWM}$; T_j = 100 ˚C	50	500	µA

STATIC CHARACTERISTICS OF MODULATOR

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	TYP	MAX.	UNIT
V_F	Forward voltage	I_F = 8 A	1.05	1.25	V
		I_F = 8 A; T_j = 125˚C	0.9	1.03	V
		I_F = 20 A	1.3	1.45	V
I_R	Reverse current.	$V_R = V_{RWM}$	10	50	µA
		$V_R = V_{RWM}$; T_j = 100 ˚C	100	350	µA

ELECTRICAL CHARACTERISTICS OF DAMPER

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
t_{rr}	Reverse recovery time	I_F = 1 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 50 A/µs	200	300	ns
Q_s	Reverse recovery charge	2 A,30 V,20 A/µs	1.2	2.0	µC
V_{fr}	Peak forward recovery voltage	I_F = 6.5 A; dI_F/dt = 50 A/µs	27	-	V

ELECTRICAL CHARACTERISTICS OF MODULATOR

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
t_{rr}	Reverse recovery time	I_F = 1 A; $V_R \geq$ 30 V; $-dI_F/dt$ = 100 A/µs	35	60	ns
I_{rrm}	Peak reverse recovery current	I_F = 10 A to $V_R \geq$ 30 V; dI_F/dt = 50 A/µs; T_j = 100˚C	3.0	5.5	A
Q_s	Reverse recovery charge	2 A,30 V,20 A/µs	40	70	nC
V_{fr}	Peak forward recovery voltage	I_F = 10 A; dI_F/dt = 10 A/µs	3.2	-	V

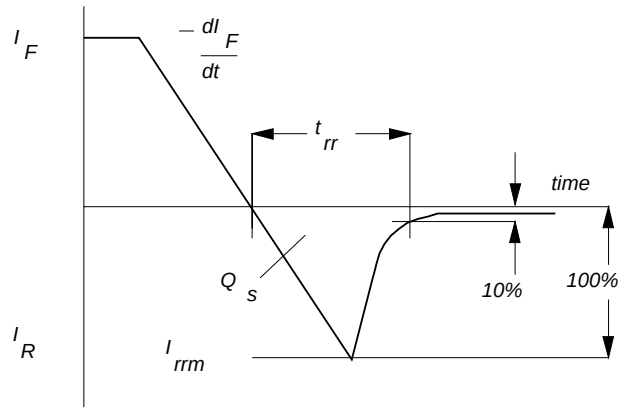


Fig.1. Definition of t_{rr}, Q_s and I_{rrm} Modulator

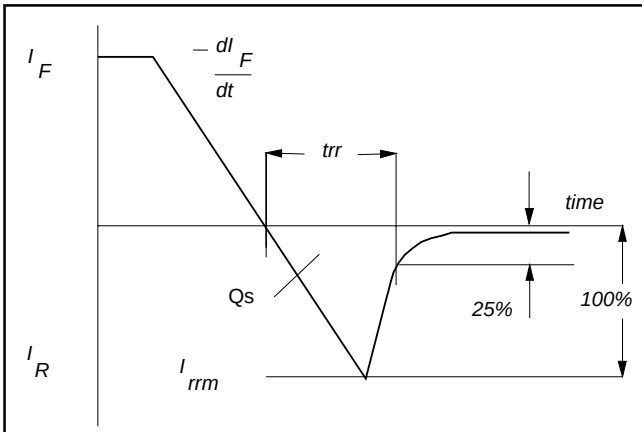


Fig.2. Definition of t_{rr}, Q_s and I_{rrm} of damper.

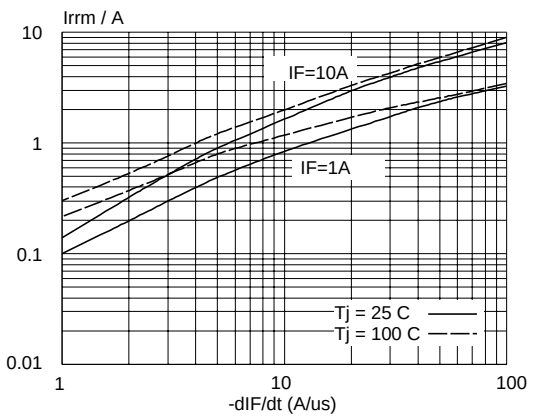


Fig.3. Modulator maximum I_{rrm} at T_j = 100˚C

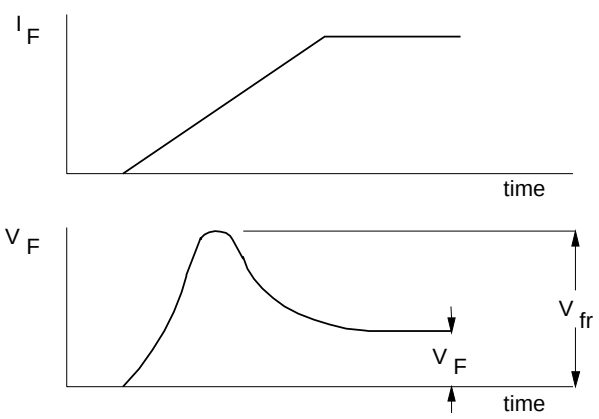


Fig.4. Definition of V_{fr}

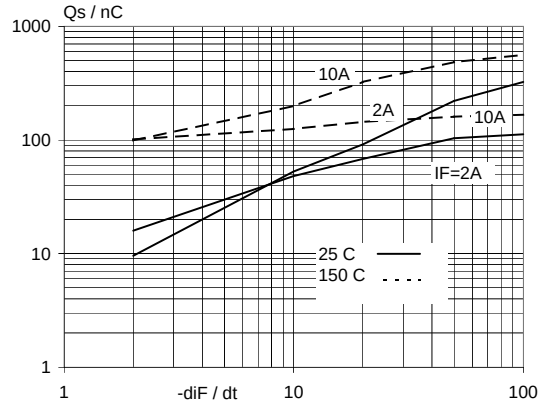


Fig.5. Modulator maximum Q_s at T_j = 25˚C and 150˚C

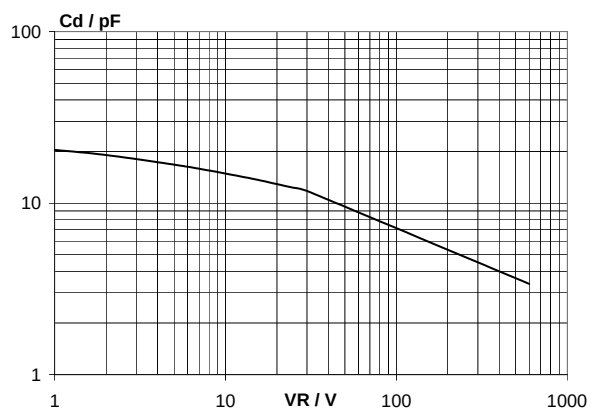


Fig.6. Modulator typical junction capacitance C_d at f = 1 MHz, T_j = 25˚C

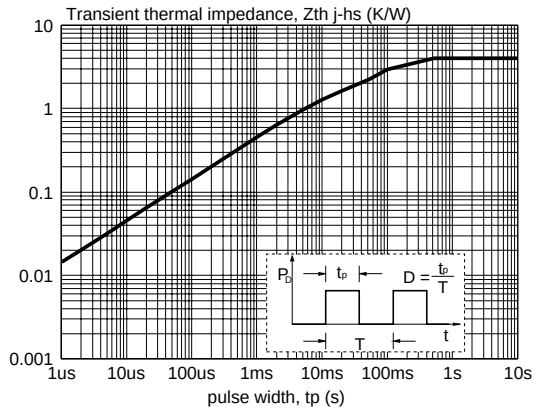


Fig.7. Modulator transient thermal impedance $Z_{th} = f(t_p)$

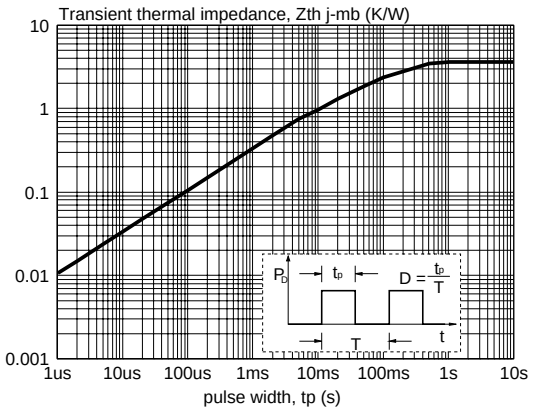


Fig.10. Damper transient thermal impedance $Z_{th} = f(t_p)$

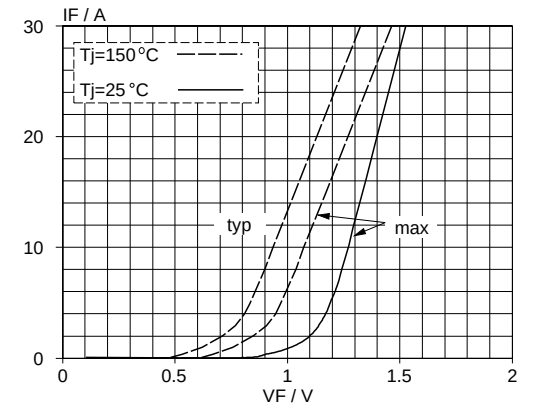


Fig.8. Modulator typical and maximum forward characteristic; $I_F = f(V_F)$; parameter T_j

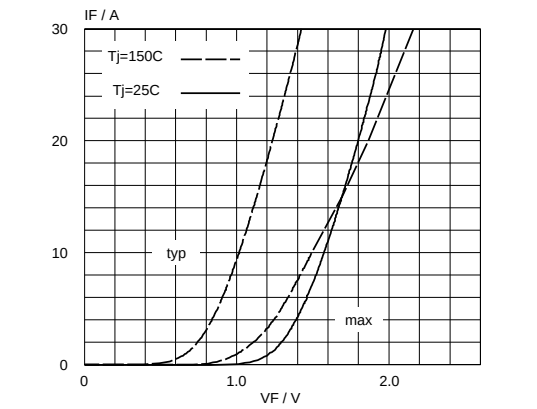


Fig.11. Damper forward characteristic $I_F = f(V_F)$; parameter T_j

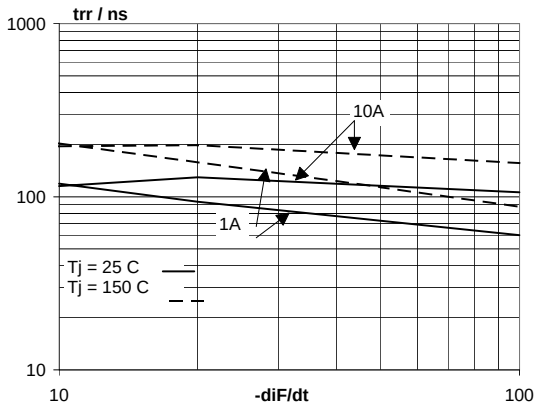


Fig.9. Modulator maximum t_{rr} measured to 25% of I_{rrm}; $T_j = 25^{\circ}C$ and $150^{\circ}C$

MECHANICAL DATA

Dimensions in mm

Net Mass: 5.88 g

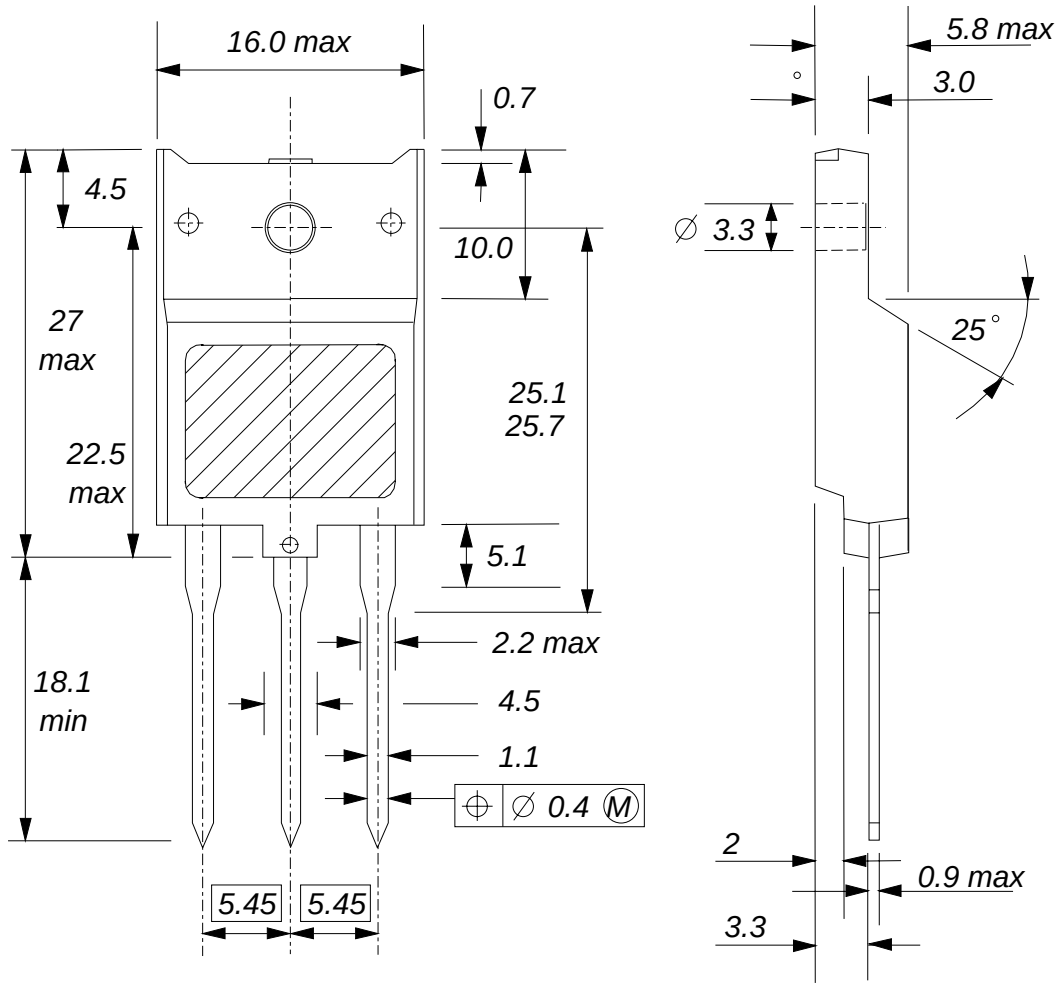


Fig.12. SOT399; The seating plane is electrically isolated from all terminals.

Notes
1. Refer to mounting instructions for F-pack envelopes.
2. Epoxy meets UL94 V0 at 1/8".

DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.