

MD1802FX

High voltage NPN power transistor for standard definition CRT display

Features

- State-of-the-art technology:
 - Diffused collector "Enhanced generation"
- Stable performances versus operating temperature variation
- Low base-drive requirements
- Tight h_{FE} range at operating collector current
- Fully insulated power package U.L. compliant

Applications

- Horizontal deflection output for TV
- Switch mode power supplies for CRT TV



The MD1802FX is manufactured using Diffused Collector in Planar Technology adopting new and enhanced high voltage structure. The new MD product series show improved silicon efficiency bringing updated performance to the Horizontal Deflection stage.

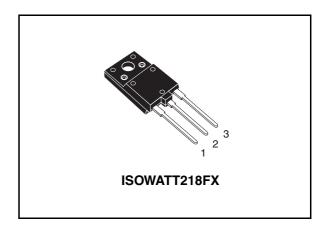


Figure 1. Internal schematic diagram

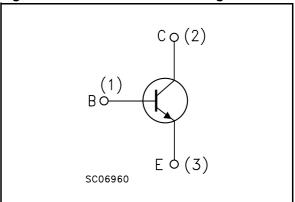


Table 1. Device summary

Order code	Marking	Package	Packing
MD1802FX	MD1802FX	ISOWATT218FX	Tube

Content MD1802FX

Content

1	Electrical ratings		
2	Elec	trical characteristics	4
	2.1	Electrical characteristics (curves)	5
	2.2	Test circuits	7
3	Pack	age mechanical data	8
4	Revie	sion history	10

MD1802FX Electrical ratings

1 Electrical ratings

Table 2. Absolute maximum rating

Symbol	Parameter	Value	Unit
V _{CES}	Collector-emitter voltage (V _{BE} = 0)	1500	V
V _{CEO}	Collector-emitter voltage (I _B = 0)	700	V
V _{EBO}	Collector-base voltage (I _C = 0)	9	V
I _C	Collector current	10	Α
I _{CM}	Collector peak current (t _P < 5ms)	15	Α
I _B	Base current	5	Α
P _{TOT}	Total dissipation at T _c = 25°C	57	W
V _{ins}	Insulation withstand voltage (RMS) from all three leads to external heatsink 2500		V
T _{stg}	Storage temperature	-65 to 150	°C
T _J Max. operating junction temperature		150	

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R _{thj-case}	Thermal resistance junction-case max	2.2	°C/W

5/

Electrical characteristics MD1802FX

2 Electrical characteristics

 $(T_{case} = 25^{\circ}C \text{ unless otherwise specified})$

Table 4. Electrical characteristics

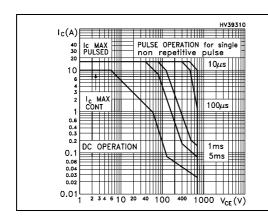
Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
I _{CES}	Collector cut-off current (V _{BE} =0)	V _{CE} = 1500V V _{CE} = 1500V; T _C = 125°C			0.2 2	mA mA
I _{EBO}	Emitter cut-off current (I _C =0)	V _{EB} = 9V			1	mA
V _{CEO(sus)} (1)	Collector-emitter sustaining voltage (I _C =0)	I _C = 100mA	700			V
V _{CE(sat)} (1)	Collector-emitter saturation voltage	I _C = 5A I _B = 1.25A			1.5	V
V _{BE(sat)} (1)	Base-emitter saturation voltage	$I_C = 5A$ $I_B = 1.25A$			1.2	V
h _{FE} ⁽¹⁾	DC current gain	$\begin{split} I_{C} &= 1 A & V_{CE} &= 5 V \\ I_{C} &= 5 A & V_{CE} &= 1 V \\ I_{C} &= 5 A & V_{CE} &= 5 V \end{split}$		23 5.5	8.5	
t _s	Inductive load Storage time Fall time	$\begin{split} I_C = 4A & I_{B(on)} = 500 \text{mA} \\ V_{BE(off)} = -2.7 V & f_h = 16 \text{KHz} \\ L_{BB(off)} = 4.5 \mu \text{H} \end{split}$		2.4 0.2		μs μs

^{1.} Pulsed: Pulse duration = 300 ms, duty cycle 1.5 %

2.1 Electrical characteristics (curves)

Figure 2. Safe operating area

Figure 3. Derating curve



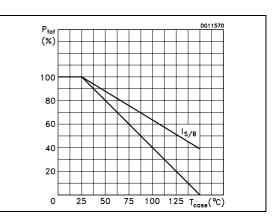
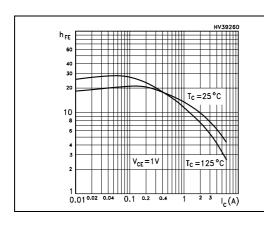


Figure 4. DC current gain

Figure 5. DC current gain



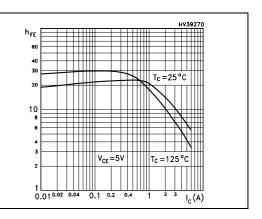
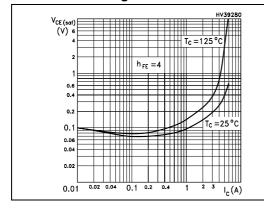
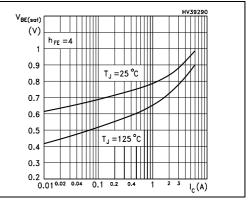


Figure 6. Collector-emitter saturation voltage

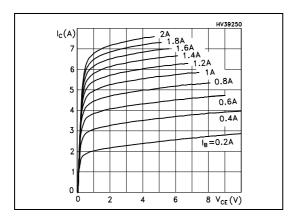
Figure 7. Base-emitter saturation voltage





Electrical characteristics MD1802FX

Figure 8. Output characteristics



2.2 Test circuits

Figure 9. Power losses and inductive load switching

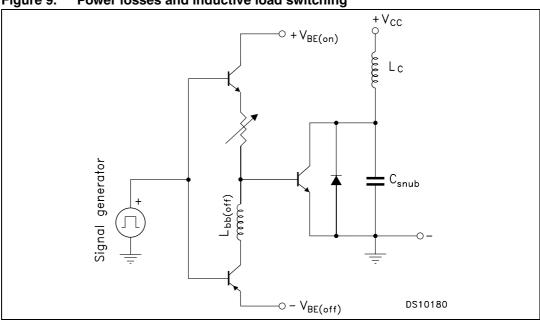
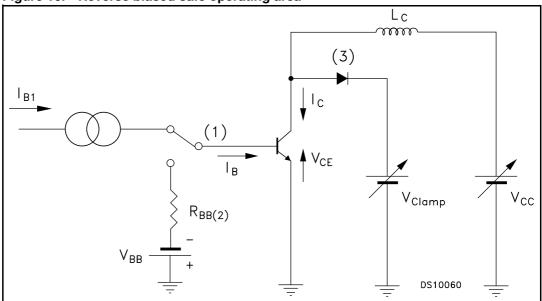


Figure 10. Reverse biased safe operating area



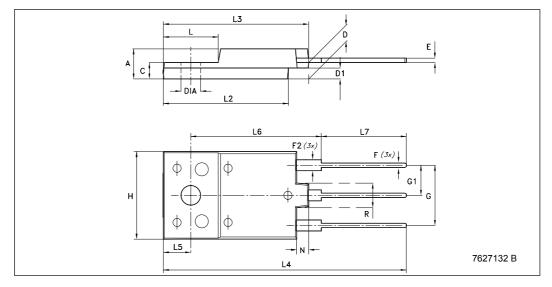
577

3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

ISOWATT218FX mechanical data

Dim.		mm.	
Dim.	Min.	Тур	Max.
Α	5.30		5.70
С	2.80		3.20
D	3.10		3.50
D1	1.80		2.20
E	0.80		1.10
F	0.65		0.95
F2	1.80		2.20
G	10.30		11.50
G1		5.45	
Н	15.30		15.70
L	9		10.20
L2	22.80		23.20
L3	26.30		26.70
L4	43.20		44.40
L5	4.30		4.70
L6	24.30		24.70
L7	14.60	15	
N	1.80		2.20
R	3.80		4.20
Dia	3.40		3.80



577

Revision history MD1802FX

4 Revision history

Table 5. Document revision history

Date	Revision	Changes
02-Aug-2006	1	Initial release.
14-Aug-2007	2	Complete document, added all curves (2.1: Electrical characteristics (curves)

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