

MD1803DFX

High voltage NPN Power transistor for standard definition CRT display

Features

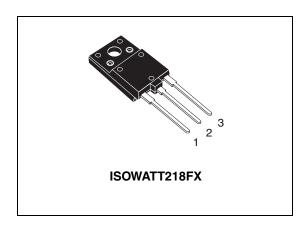
- State-of-the-art technology:
 - Diffused collector "enhanced generation"
- More stable performance versus operating temperature variation
- Low base drive requirement
- Tighter h_{FE} range at operating collector current
- Fully insulated power package U.L. compliant
- Integrated free wheeling diode
- In compliance with the 2002/93/EC european directive



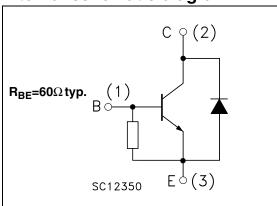
■ Horizontal deflection output for TV

Description

The MD1803DFX 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.



Internal schematic diagram



Order codes

Part number	Marking	Package	Packing
MD1803DFX MD1803DFX		ISOWATT218FX	TUBE

September 2006 Rev 6 1/10

Electrical ratings MD1803DFX

1 Electrical ratings

Table 1. 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}	Emitter-base voltage (I _C = 0)	10	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 _{isol}	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 2. Thermal data

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

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MD1803DFX Electrical characteristics

2 Electrical characteristics

 $(T_{CASE} = 25^{\circ}C; unless otherwise specified)$

Table 3. Electrical characteristics

Symbol	Parameter	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} = 5V		40		120	mA
V _{(BR)EBO}	Emitter-base breakdown voltage $(I_C = 0)$	I _E = 700 mA		10			V
V _{CE(sat)} Note 1	Collector-emitter saturation voltage	I _C = 5 A	I _B = 1.25 A			2	V
V _{BE(sat)} Note 1	Base-emitter saturation voltage	I _C = 5 A	I _B = 1.25 A			1.2	V
h _{FE} Note 1	DC current gain	$I_C = 1 A$ $I_C = 5 A$ $I_C = 5 A$	V _{CE} = 5 V V _{CE} = 1 V V _{CE} = 5 V	5.5	18 5	7.5	
V_{f}	Diode forward voltage	I _F = 5 A				1.6	V
t _s	Inductive load Storage time Fall time	$I_{C} = 4A$ $I_{B(on)} = 0.6A$ $L_{BB(off)} = 4.5\mu H$	$f_h = 16KHz$ $V_{BE(off)} = -2.7V$		2.5 0.3	3 0.6	μs μs

¹ Pulsed duration = 300 μ s, duty cycle \leq 1.5%.

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Electrical characteristics MD1803DFX

2.1 Electrical characteristics (curve)

Figure 1. Safe operating area

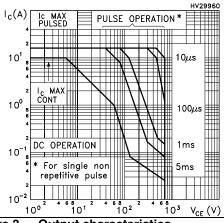


Figure 2. Derating curve

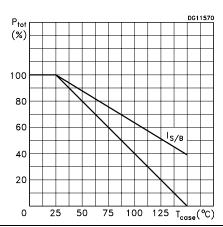
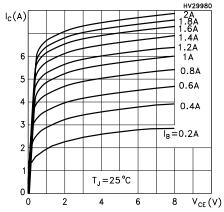


Figure 3. Output characteristics

Figure 4. Reverse biased SOA



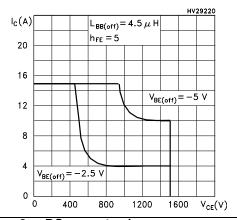


Figure 5. DC current gain

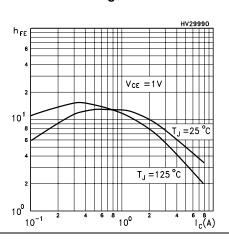
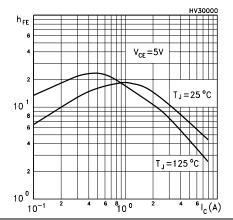
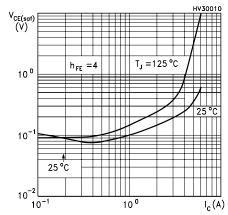


Figure 6. DC current gain



MD1803DFX Electrical characteristics

Figure 7. Collector-emitter saturation voltage Figure 8. Base-emitter saturation voltage



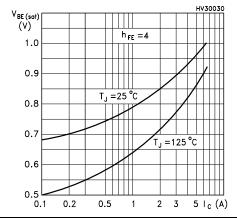
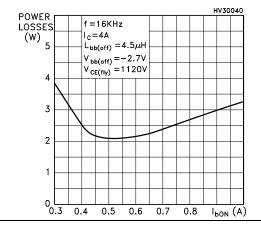
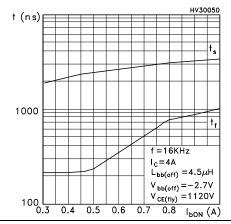


Figure 9. Power losses

Figure 10. Inductive load switching time





Electrical characteristics MD1803DFX

2.2 Test circuit

Figure 11. Power losses and inductive load switching test circuit

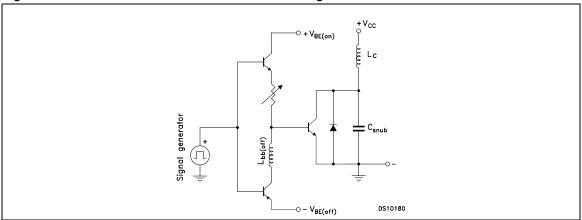
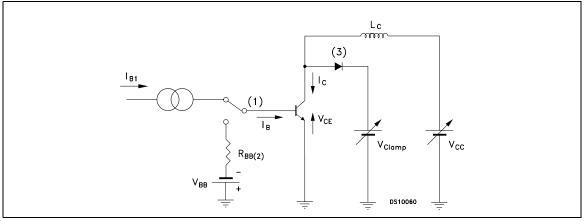


Figure 12. Reverse biased safe operating area test circuit



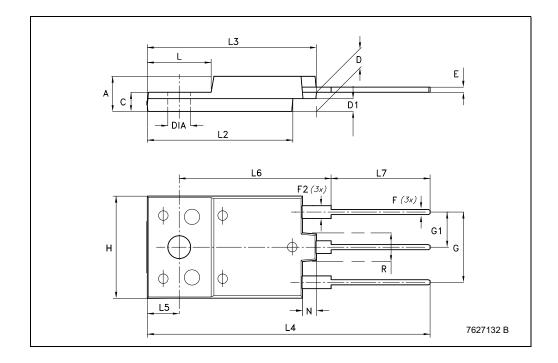
3 Package mechanical data

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

		mm.	
DIM.	MIN.	TYP	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



MD1803DFX Revision history

4 Revision history

Table 4. Revision history

Date	Revision	Changes
18-Oct-2005	1	First release
11-Nov-2005	2	New Template, no content change
15-Feb-2006	3	Complete version with curves
08-May-2006	4	Typo mistake on table1
23-May-2006	5	V _{(BR)EBO} value has been changed
22-Sep-2006	6	New h _{FE} limit



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