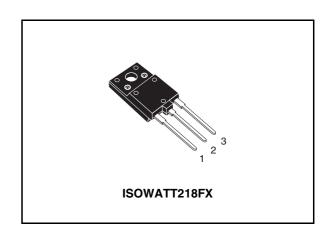


MD2103DFX

High voltage NPN power transistor for standard definition CRT display

General 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



Description

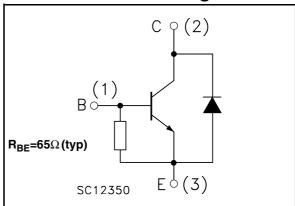
The MD2103DFX is manufactured using Diffused Collector in Planar technology adopting new and enhanced high voltage structure.

The new MD product series show improved silicon efficiency briging updated performance to the horizontal deflection stage.

Applications

■ Horizontal deflection output for TV

Internal schematic diagram



Order codes

Part number	Marking	Package	Packing
MD2103DFX	MD2103DFX	ISOWATT218FX	Tube

Contents MD2103DFX

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MD2103DFX Electrical ratings

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) 7		V
I _C	Collector current	6	Α
I _{CM}	Collector peak current (t _P < 5ms)	9	Α
I _B	Base current	3	Α
P _{tot}	Total dissipation at T _c ≤25°C	52	W
V _{INS}	Insulation withstand voltage (RMS) from all three leads to external heatsink 2500		V
T _{stg}	Storage temperature -65 to 150		°C
TJ	Max. operating junction temperature 150		°C

Table 2. Thermal data

Symbol	Parameter		Value	Unit
R _{thj-case}	Thermal resistance junction-case m	nax	2.4	°C/W

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Electrical characteristics MD2103DFX

2 Electrical characteristics

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

Table 3. Electrical characteristics

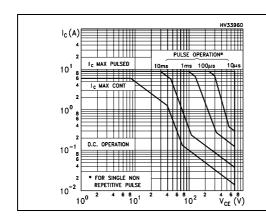
Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
I _{CES}	Collector cut-off current (V _{BE} =0)	V _{CE} = 1500V V _{CE} = 1500V T _C = 125°C			0.2 2	mA mA
I _{EBO}	Emitter cut-off current (I _C =0)	V _{EB} = 5V	50		125	mA
V _{(BR)EBO}	Emitter-base brakdown voltage (I _C = 0)	I _E = 700mA		11		V
V _{CE(sat)} (1)	Collector-emitter saturation voltage	$I_{C} = 3A$ $I_{B} = 0.75A$			1.8	V
V _{BE(sat)} (1)	Base-emitter saturation voltage	I _C = 3A I _B =0.75A			1.5	V
h _{FE} ⁽¹⁾	DC current gain	$\begin{split} I_{C} &= 1 A & V_{CE} = 5 V \\ I_{C} &= 3 A & V_{CE} = 1 V \\ I_{C} &= 3 A & V_{CE} = 5 V \end{split}$	6.5	17 6	9.5	
t _s	Inductive load Storage time Fall time	I_C =3A f_h =16kHz $I_{B(on)}$ =0.5A $V_{BE(off)}$ =-2.7V $I_{BB(off)}$ =6.3 μ H (see <i>Figure 9</i>)		3.8 0.25		μs μs
V _F	Diode forward voltage	I _F = 3A			2	V

Note (1) Pulsed duration = 300 µs, duty cycle ⊴ .5%

2.1 Electrical cMD2103DFXharacteristics (curves)

Figure 1. Safe operating area

Figure 2. Derating curve



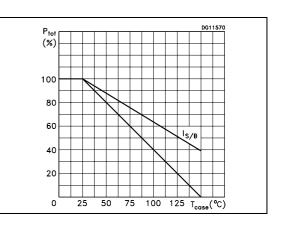
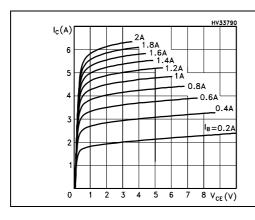


Figure 3. Output characteristics

Figure 4. Reverse biased SOA



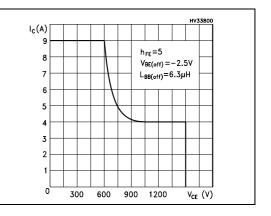
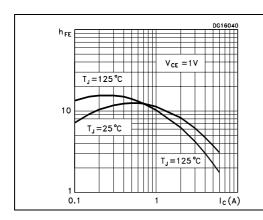
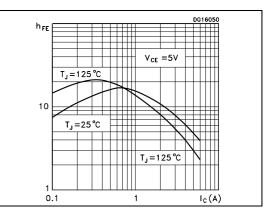


Figure 5. DC current gain

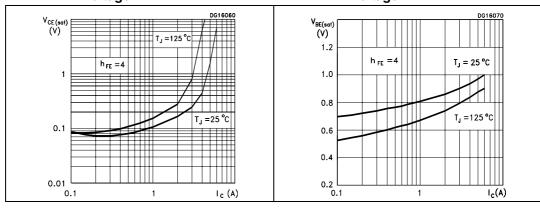
Figure 6. DC current gain





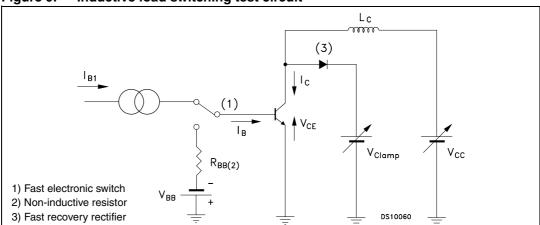
Electrical characteristics MD2103DFX

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



2.2 Test circuits

Figure 9. Inductive load switching test circuit

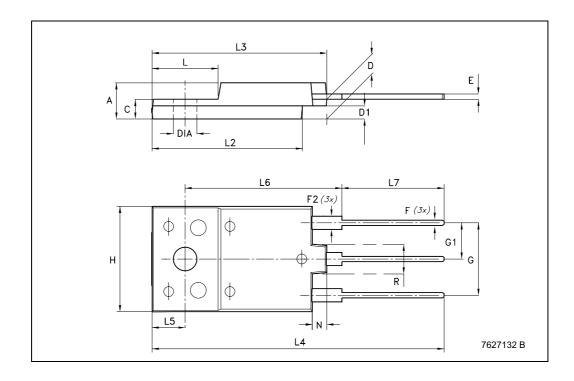


3 Package mechanical data

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

DIM.	mm.		
	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	11.9	
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



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Revision history MD2103DFX

4 Revision history

Table 4. Revision history

Date	Revision	Changes
16-Oct-2006	1	First release

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