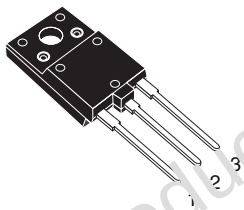
MD2103DFX

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



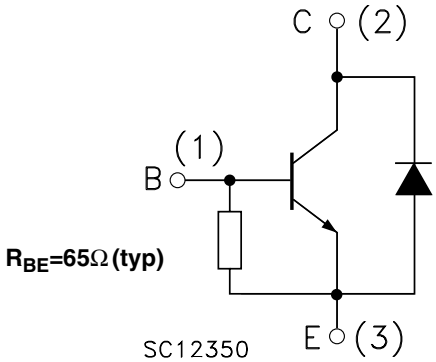
ISOWATT218FX

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.

Internal schematic diagram



Applications

- Horizontal deflection output for TV

Order codes

Part number	Marking	Package	Packing
MD2103DFX	MD2103DFX	ISOWATT218FX	Tube

Obsolete Product(s) - Obsolete Product(s)

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Obsolete Product(s) - Obsolete Product(s)

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	A
I_{CM}	Collector peak current (t_P < 5ms)	9	A
I_B	Base current	3	A
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
T_J	Max. operating junction temperature	150	°C

Table 2. Thermal data

Symbol	Parameter		Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case	max	2.4	°C/W

Obsolete Product(s) - Obsolete Product(s)

2 Electrical characteristics

(T_{case} = 25°C unless otherwise specified)

Table 3. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	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	I_C = 1A V_{CE} =5V I_C = 3A V_{CE} =1V I_C = 3A V_{CE} =5V	 6.5	17 6 	 9.5	
t_s t_f	Inductive load Storage time Fall time	I_C =3A f_h =16kHz $I_{B(on)}$ =0.5A $V_{BE(off)}$ =-2.7V $L_{BB(off)}$ =6.3µH (see *Figure 9*)		3.8 0.25		µs µs
V_F	Diode forward voltage	I_F = 3A			2	V

Note (1) Pulsed duration = 300 µs, duty cycle ≤1.5%

Obsolete Product(s) - Obsolete Product(s)

2.1 Electrical cMD2103DFXharacteristics (curves)

Figure 1. Safe operating area

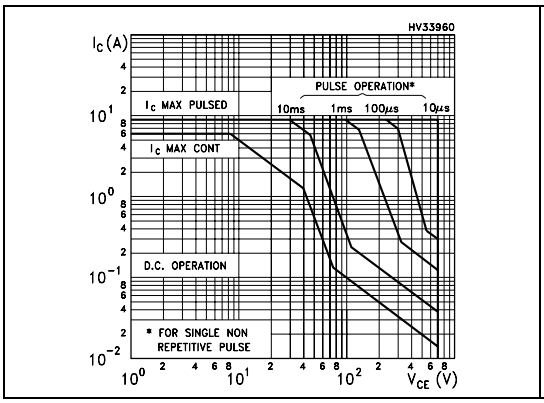


Figure 2. Derating curve

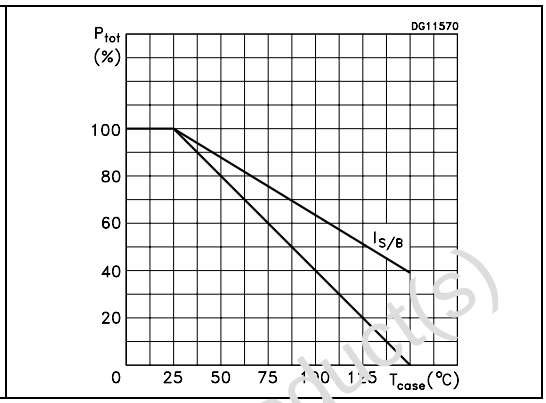


Figure 3. Output characteristics

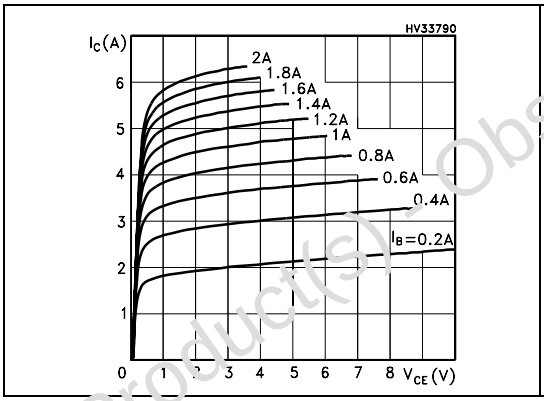


Figure 4. Reverse biased SOA

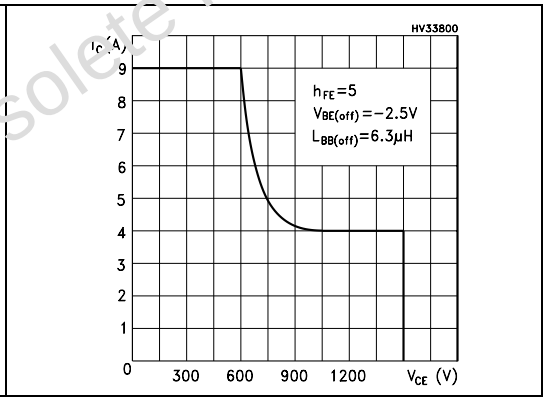


Figure 5. DC current gain

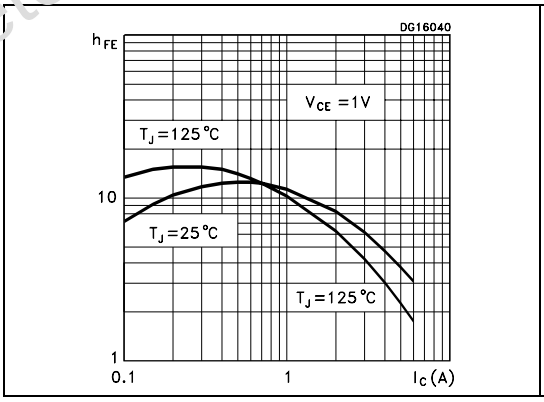
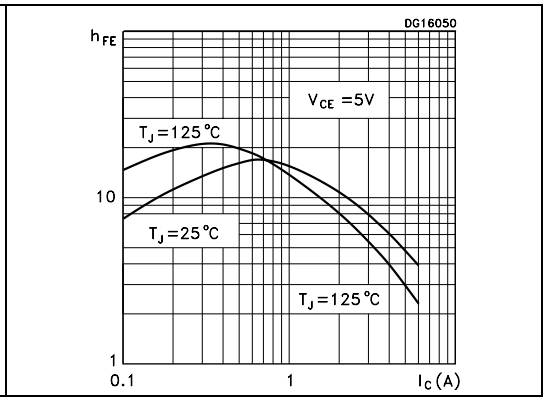


Figure 6. DC current gain



Obsolete Product(s) - Obsolete Product(s)

Figure 7. Collector-emitter saturation voltage

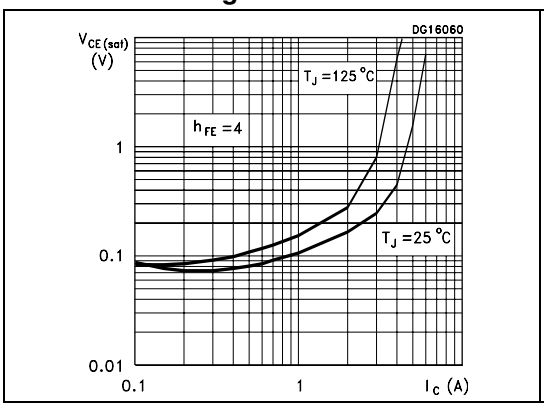
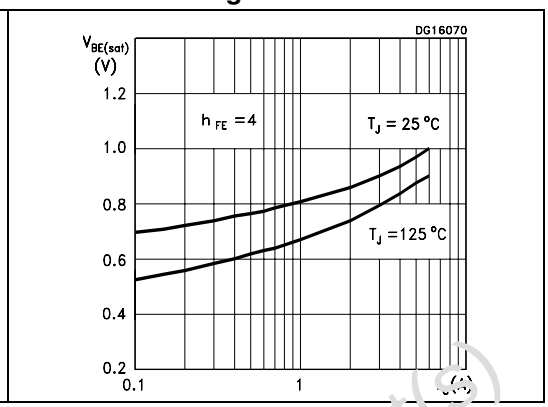


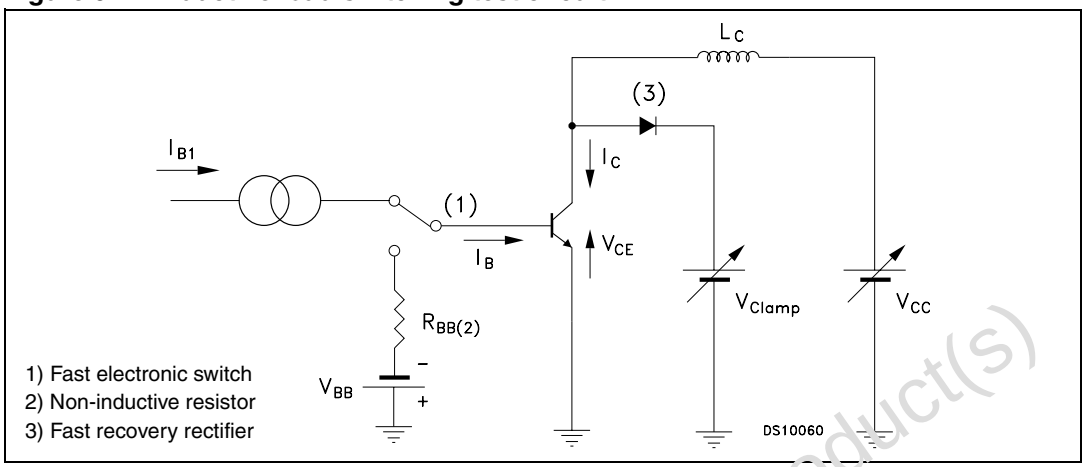
Figure 8. Base-emitter saturation voltage



Obsolete Product(s) - Obsolete Product(s)

2.2 Test circuits

Figure 9. Inductive load switching test circuit



Obsolete Product(s) - Obsolete Product(s)

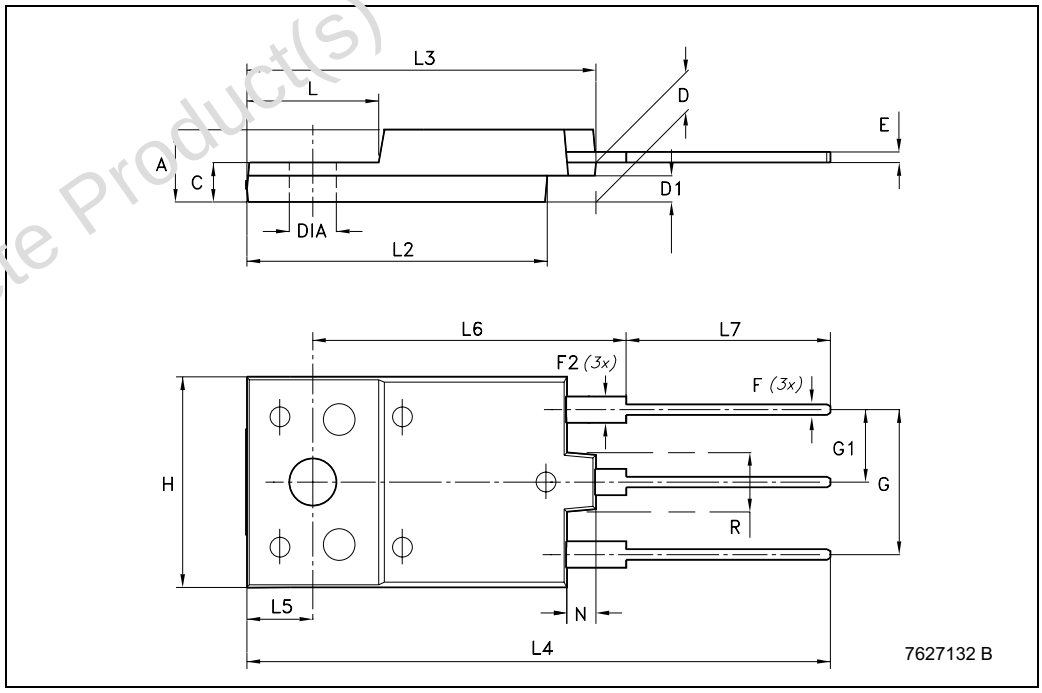
3 Package mechanical data

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

Obsolete Product(s) - Obsolete Product(s)

ISOWATT218FX MECHANICAL DATA

DIM.	mm.		
	MIN.	TYP	MAX.
A	5.30		5.70
C	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	
H	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



Obsolete Product(s) - Obsolete Product(s)

4 Revision history

Table 4. Revision history

Date	Revision	Changes
16-Oct-2006	1	First release

Obsolete Product(s) - Obsolete Product(s)

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