

MD1803DFH

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
- Creepage distance path > 4mm
- Integrated free wheeling diode
- In compliance with the 2002/93/ec european directive

Applications

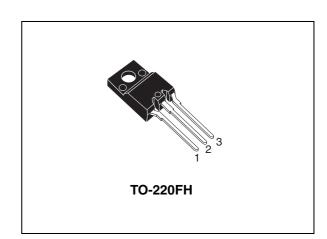
Horizontal deflection output for TV

Description

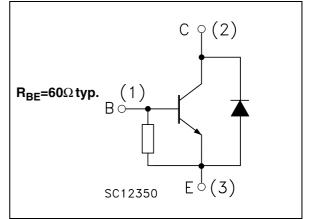
The MD1803DFH is manufactured using Diffused Collector in Planar Technology adopting new and enhanced high voltage structure. The new MD product series show improved silicon efficiency bringing updated performance to the Horizontal Deflection stage.

Order codes

Part number	Marking	Package	Packing
MD1803DFH	MD1803DFH	TO-220FH	TUBE



Internal schematic diagram



1 Electrical ratings

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
Ι _C	Collector current	10	Α
I _{CM}	Collector peak current (t _P < 5ms)	15	Α
Ι _Β	Base current	5	Α
P _{TOT}	Total dissipation at $T_c = 25^{\circ}C$	40	W
V _{isol}	Insulation withstand voltage (rms) from all three leads to external heatsink	2500	V
T _{stg}	Storage temperature	-65 to 150	°C
ТJ	Max. operating junction temperature	150	

Table 1. Absolute maximum rating

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R _{thj-case}	Thermal resistance junction-case Max	3.125	°C/W



2 Electrical characteristics

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

Symbol	Parameter	Test cor	nditions	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 $(I_{\rm C}=0)$	V _{EB} = 5V		40		120	mA
V _{(BR)EBO}	Emitter-base breakdown voltage $(I_{\rm C}=0)$	I _E = 700 mA		7			V
V _{CE(sat)} Note 1	Collector-emitter saturation voltage	I _C = 5 A	l _B = 1.25 A			2	V
V _{BE(sat)} Note 1	Base-emitter saturation voltage	I _C = 5 A	l _B = 1.25 A			1.2	V
h		I _C = 1 A	$V_{CE} = 5 V$		18		
h _{FE} Note 1	DC current gain	I _C = 5 A	$V_{CE} = 1 V$		5		
Note 1		I _C = 5 A	V _{CE} = 5 V	5		8	
V _f	Diode forward voltage	I _F = 5 A				1.6	V
	Inductive load	$I_{C} = 4A$	f _h = 16KHz				
t _s	Storage time	$I_{B(on)} = 0.6A$	$V_{BE(off)} = -2.7V$		2.5	3	μs
t _f	Fall time	$L_{BB(off)} = 4.5 \mu H$			0.3	0.6	μs

Table 3. Electrical characteristics

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



Electrical characteristics (curve) 2.1

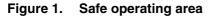
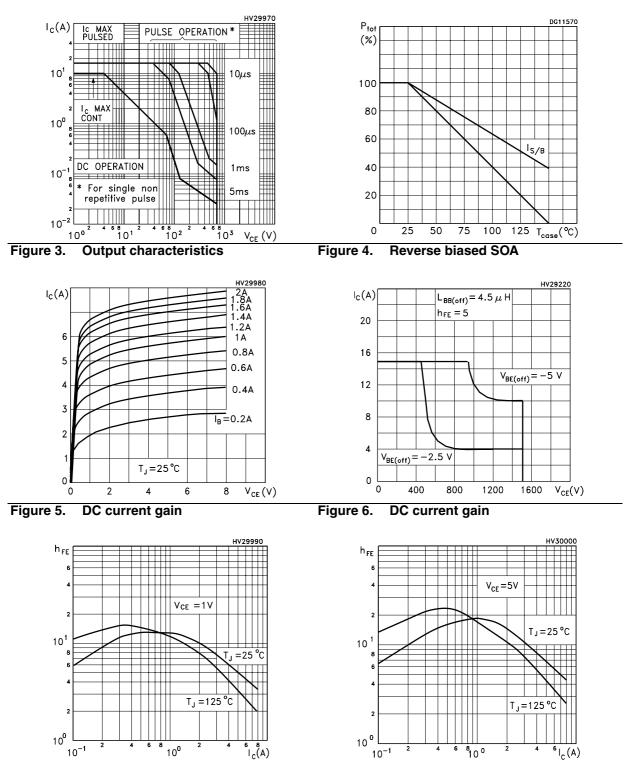


Figure 2. **Derating curve**



٥_c(A)

2

10⁻¹

4

2

4

۴۱_с(А)



T_J =125 ℃

5 I_c (A)

2 3

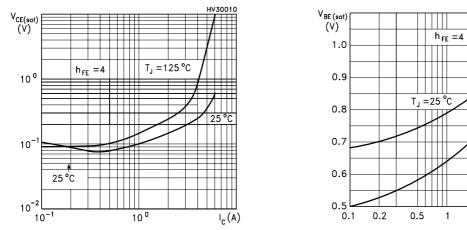
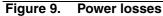
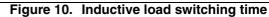
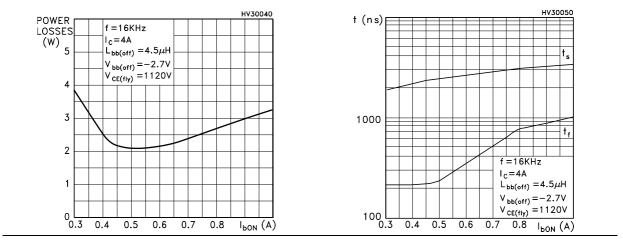


Figure 7. Collector-emitter saturation voltage Figure 8. Base-emitter saturation voltage







57

2.2 Test circuit

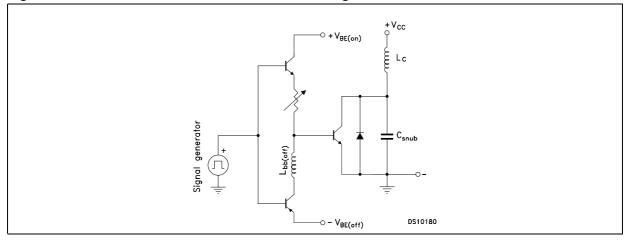
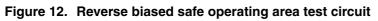
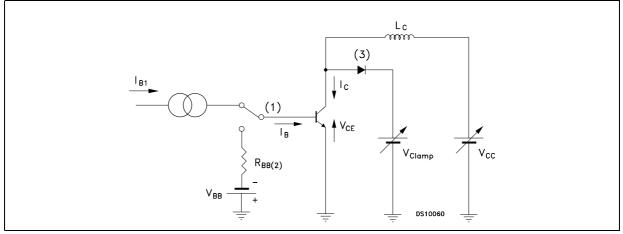


Figure 11. Power losses and inductive load switching test circuit







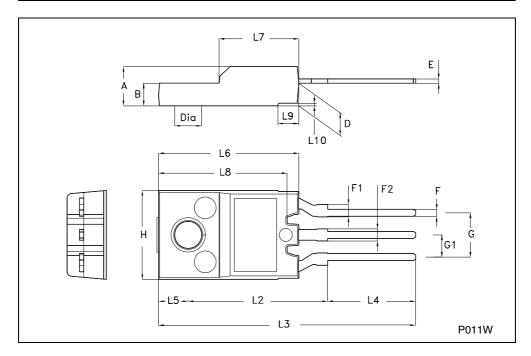
3 Package mechanical data

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



DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
А	4.4		4.6	0.173		0.181
В	2.5		2.7	0.098		0.106
D	2.5		2.75	0.098		0.108
Е	0.45		0.7	0.017		0.027
F	0.75		1	0.030		0.039
F1	1.3		1.8	0.051		0.070
F2	1.3		1.8	0.051		0.070
G	4.95		5.2	0.195		0.204
G1	2.4		2.7	0.094		0.106
Н	10		10.4	0.393		0.409
L2		16			0.630	
L3	28.6		30.6	1.126		1.204
L4	9.8		10.6	0.385		0.417
L5		3.4			0.134	
L6	15.9		16.4	0.626		0.645
L7	9		9.3	0.354		0.366
L8	14.5		15	0.570		0.590







4 Revision history

Table 4.	Revision	history
	nevision	matory

Date	Revision	Changes
18-Oct-2005	1	First release
15-Feb-2006	2	New template, complete version with curves
08-May-2006	3	Typo mistake on table1



Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZE REPRESENTATIVE OF ST, ST PRODUCTS ARE NOT DESIGNED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS, WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2006 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com

