

Very high voltage NPN power transistor
for high definition and slim CRT display

Features

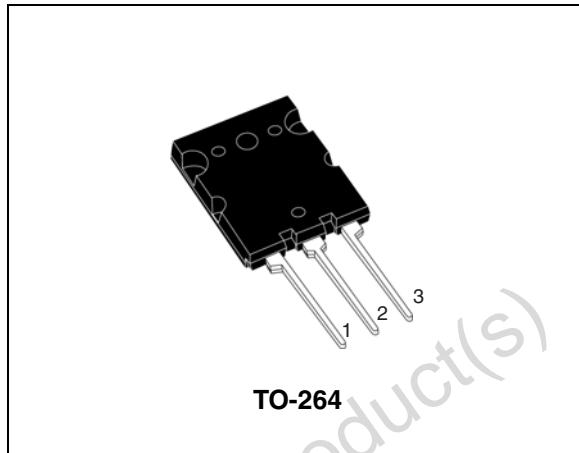
- State-of-the-art technology: diffused collector "enhanced generation" EHVS1
- Wide range of optimum drive conditions
- Stable performance versus operating temperature variation

Applications

- High-definition and slim CRT TV and monitors

Description

The HD1760JL is manufactured using Diffused Collector in Planar technology adopting new and Enhanced High Voltage Structure 1 (E.H.V.S.1) developed to fit High-Definition CRT display. The new HD product series show improved silicon efficiency bringing updated performance to the Horizontal Deflection stage.



Internal schematic diagram

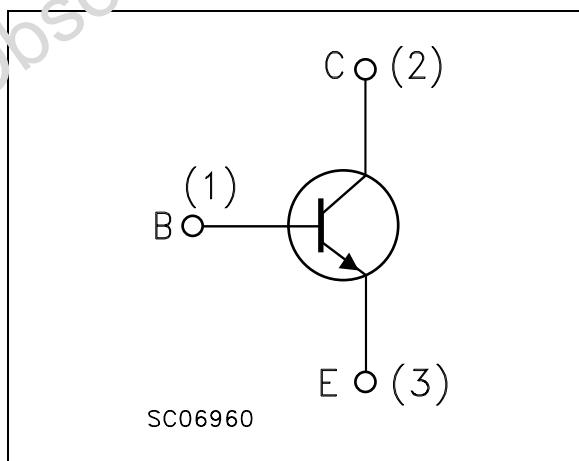


Table 1. Device summary

Part number	Marking	Package	Packaging
HD1760JL	HD1760JL	TO-264	Tube

1 Electrical ratings

Table 2. Absolute maximum rating

Symbol	Parameter	Value	Unit
V_{CES}	Collector-emitter voltage ($V_{BE} = 0$)	1700	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	800	V
V_{EBO}	Emitte-base voltage ($I_C = 0$)	10	V
I_C	Collector current	36	A
I_{CM}	Collector peak current ($t_P < 5\text{ms}$)	54	A
I_B	Base current	18	A
I_{BM}	Base peak current ($t_P < 5\text{ms}$)	27	A
P_{TOT}	Total dissipation at $T_c = 25^\circ\text{C}$	200	W
T_{STG}	Storage temperature	-55 to 150	$^\circ\text{C}$
T_J	Max. operating junction temperature	150	$^\circ\text{C}$

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance junction case	Max	$^\circ\text{C}/\text{W}$

2 Electrical characteristics

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

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector cut-off current ($V_{BE} = 0$)	$V_{CE} = 1700\text{V}$ $V_{CE} = 1700\text{V}$ $T_C = 125^\circ\text{C}$			0.2 2	mA mA
I_{EBO}	Emitter cut-off current ($I_C = 0$)	$V_{EB} = 5\text{V}$			10	μA
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage ($I_B = 0$)	$I_C = 10\text{mA}$	800			V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	$I_E = 10\text{mA}$	10			V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 18\text{A}$ $I_B = 4.5\text{A}$			2	V
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 18\text{A}$ $I_B = 4.5\text{A}$			1.5	V
h_{FE}	DC current gain	$I_C = 2\text{A}$ $V_{CE} = 5\text{V}$ $I_C = 18\text{A}$ $V_{CE} = 5\text{V}$	5	30	8.5	
t_s t_f	Inductive load Storage time Fall time	$I_C = 12\text{A}$ $f_h = 32\text{ KHz}$ $I_{B(on)} = 1\text{A}$ $I_{B(off)} = -6.9\text{A}$ $V_{CE(fly)} = 1340\text{V}$ $V_{BE(off)} = -2.7\text{V}$ $L_{BB(on)} = 0.8\mu\text{H}$		2.6 300		μs ns
t_s t_f	Inductive load Storage time Fall time	$I_C = 8\text{A}$ $f_h = 100\text{kHz}$ $I_{B(on)} = 1.3\text{A}$ $I_{B(off)} = -5.8\text{A}$ $V_{CE(fly)} = 1300\text{V}$ $V_{BE(off)} = -2.7\text{V}$ $L_{BB(on)} = 0.25\mu\text{H}$		2 110		μs ns

1. Pulsed duration = 300 ms, duty cycle 1.5%.

2.1 Electrical characteristics (curve)

Figure 1. Safe operating area

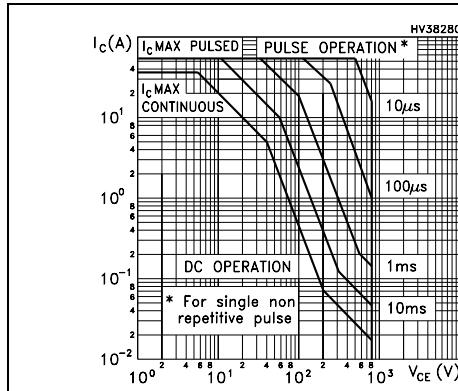


Figure 2. Derating curve

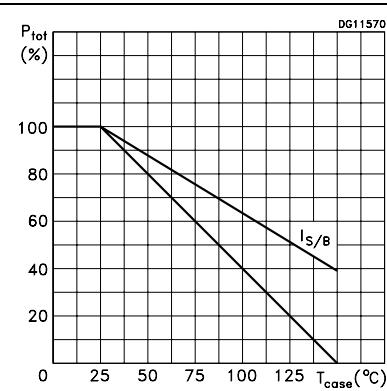


Figure 3. Output characteristics

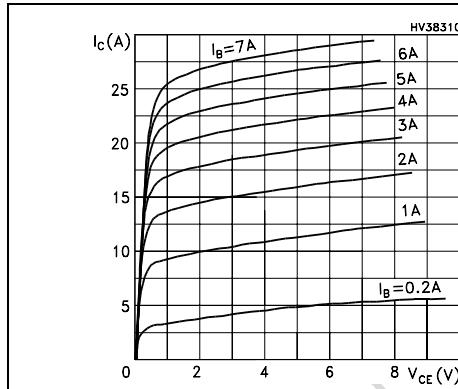


Figure 4. Reverse biased SOA

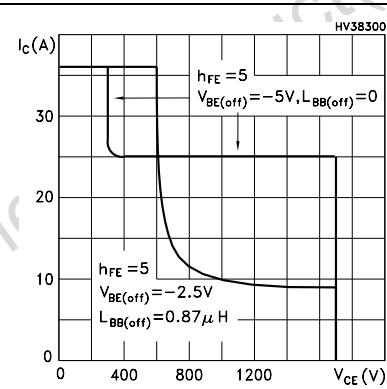


Figure 5. DC current gain

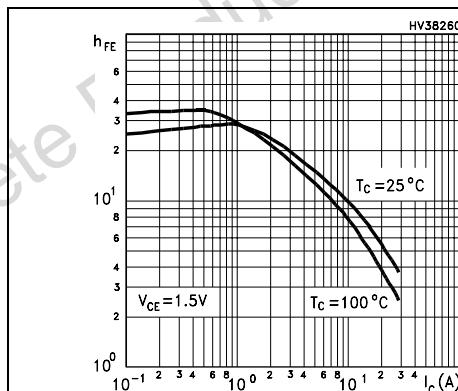


Figure 6. DC current gain

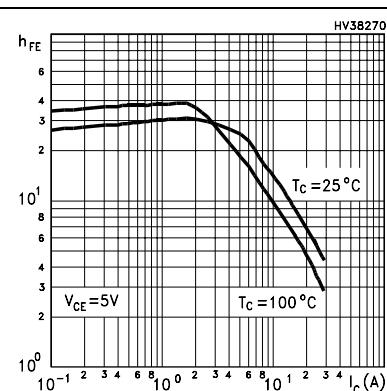


Figure 7. Collector-emitter saturation voltage

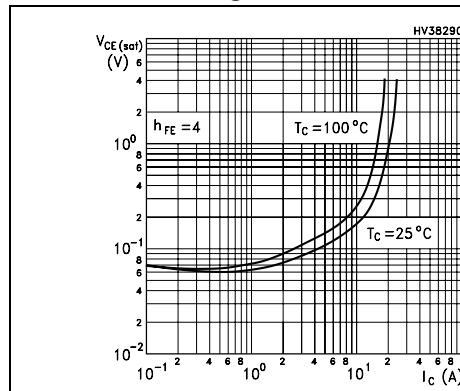


Figure 8. Base-emitter saturation voltage

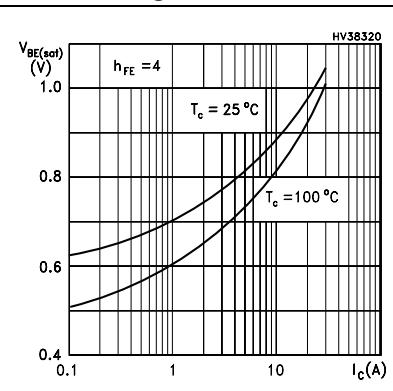


Figure 9. Power losses

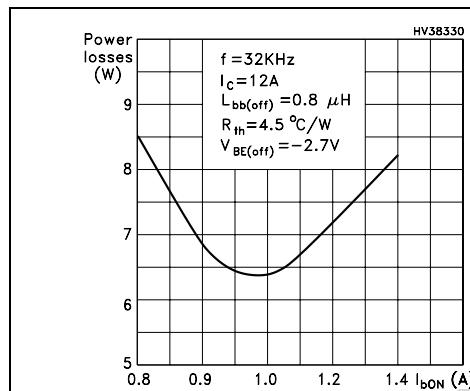


Figure 10. Power losses

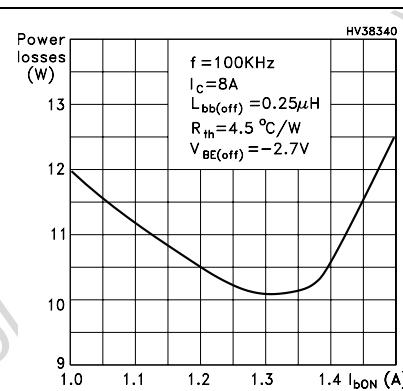
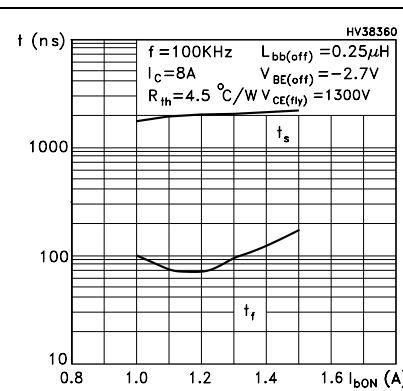
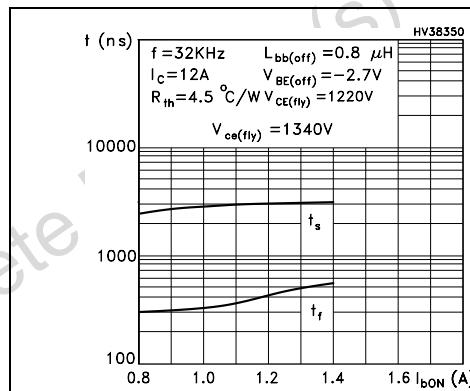


Figure 11. Inductive load switching time



3 Test circuit

Figure 13. Power losses and inductive load switching test circuit

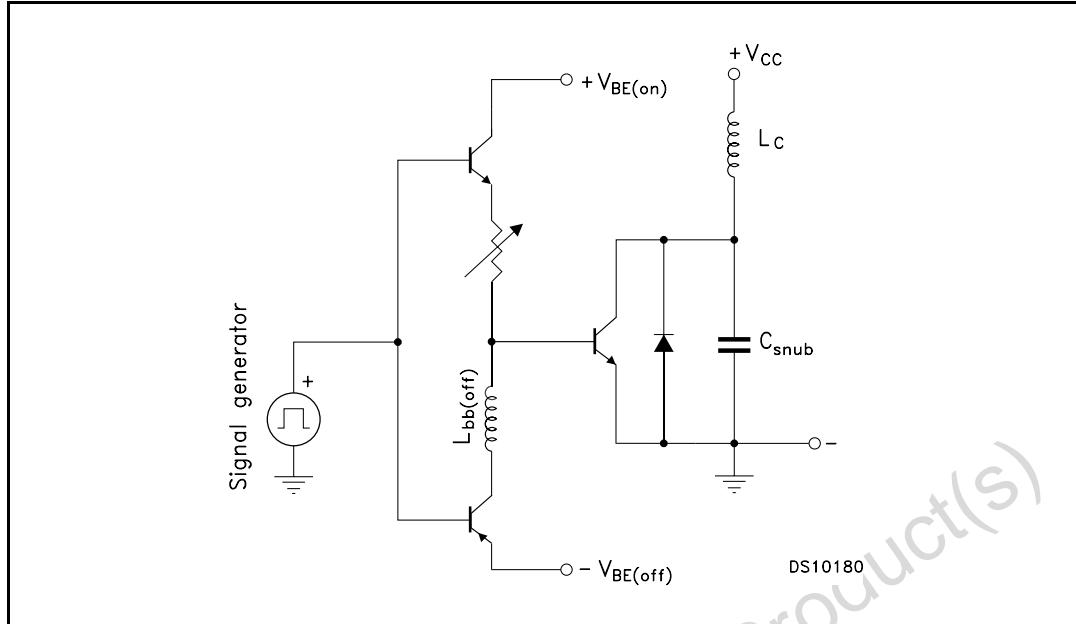
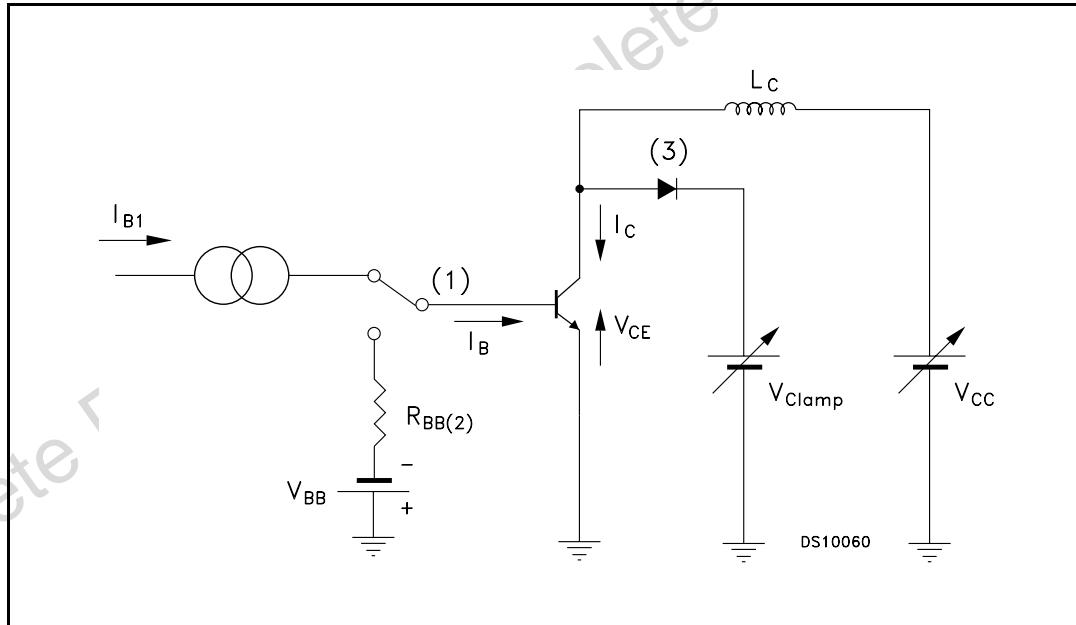


Figure 14. Reverse biased safe operating area test circuit



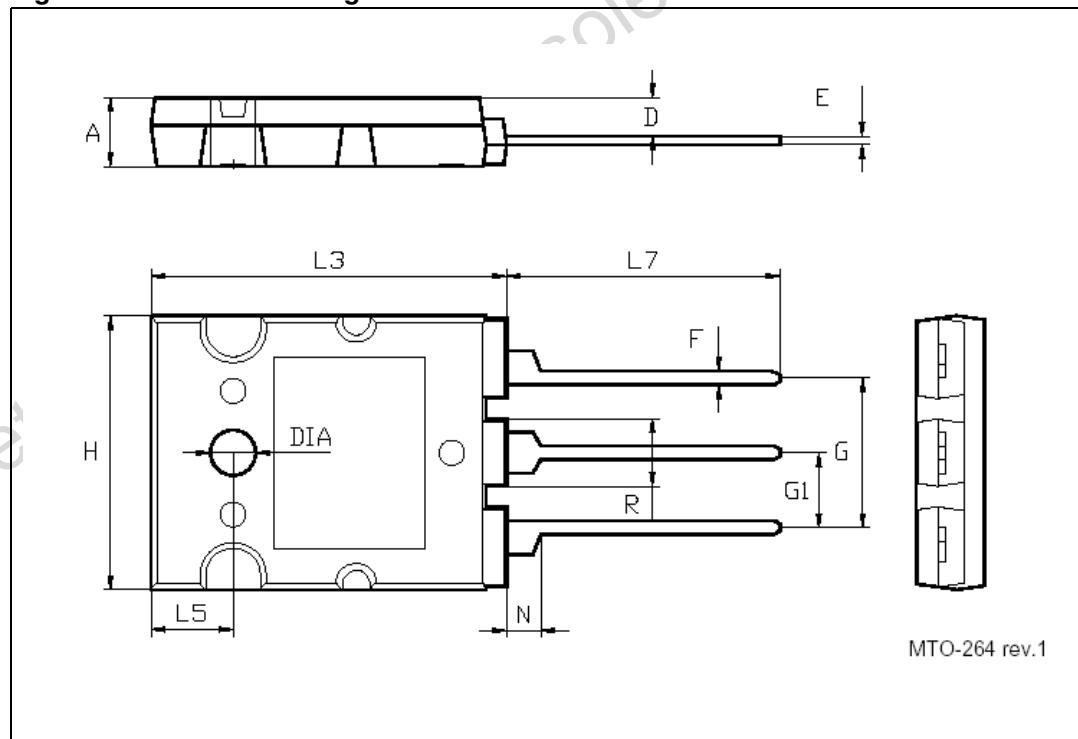
4 Package mechanical data

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

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Table 5. TO-264 mechanical data

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.80		5.20	0.189		0.205
D	2.50		3.10	0.098		0.122
E	0.50	0.60	0.85	0.020	0.24	0.033
F	0.90	1.00	1.25	0.036	0.039	0.049
G	10.30		11.50	0.406		0.453
G1		5.45			0.215	
H	19.80		20.20	0.780		0.795
L3	25.80		26.20	1.016		1.031
L5	5.80		6.20	0.228		0.244
L7	19.50		20.50	0.768		0.807
N	2.30		2.70	0.091		0.106
R	4.7		5.10	0.185		0.201
DIA	3.10		3.50	0.122		0.138

Figure 15. TO-264 drawing

5 Revision history

Table 6. Revision history

Date	Revision	Changes
17-Oct-2005	1	Initial release.
03-Nov-2005	2	h_{FE} value has been changed on Table 4
14-Jun-2007	3	Complete version: new Section 2.1 inserted

Obsolete Product(s) - Obsolete Product(s)

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