



# HD1750JL

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

PRELIMINARY DATA

## Features

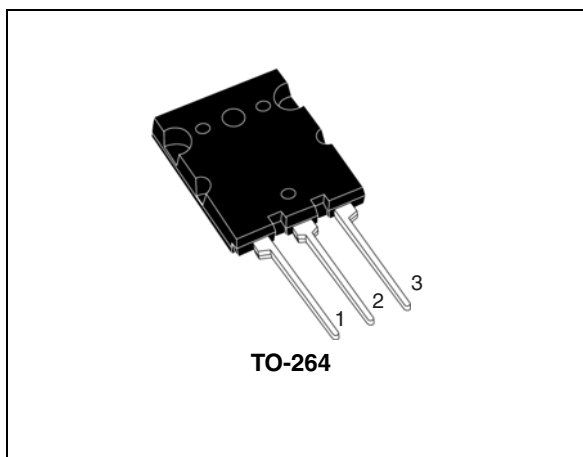
- State-of-the-art technology: diffused collector “enhanced generation” EHVS1
- Wider range of optimum drive conditions
- Less sensitive to operating temperature variation
- In compliance with the 2002/93/EC European directive

## Description

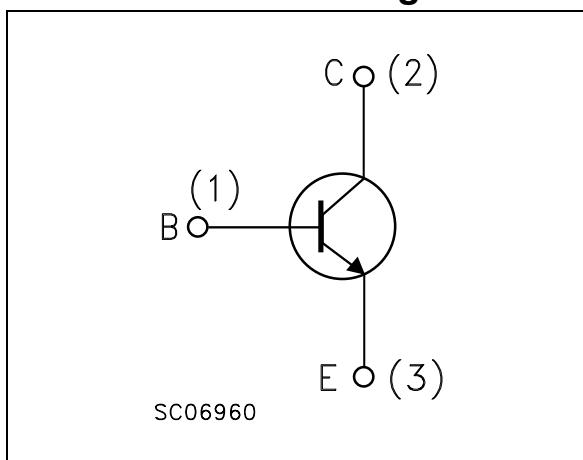
The HD1750JL is manufactured using Diffused Collector in Planar technology adopting new and Enhanced High Voltage Structure 1 (E.H.V.S.1) developed to fit High-Definition CRT display. The new HD product series show improved silicon efficiency bringing updated performance to the Horizontal Deflection stage.

## Applications

- High-definition and slim CRT TV and monitors



## Internal schematic diagram



## Order code

Part number	Marking	Package	Packaging
HD1750JL	HD1750JL	TO-264	Tube

# 1 Electrical ratings

**Table 1. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-emitter voltage ( $V_{BE} = 0$ )	1700	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	800	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	10	V
$I_C$	Collector current	24	A
$I_{CM}$	Collector peak current ( $t_P < 5\text{ms}$ )	36	A
$I_B$	Base current	12	A
$I_{BM}$	Base peak current ( $t_P < 5\text{ms}$ )	18	A
$P_{TOT}$	Total dissipation at $T_C = 25^\circ\text{C}$	200	W
$T_{STG}$	Storage temperature	-65 to 150	$^\circ\text{C}$
$T_J$	Max. operating junction temperature	150	$^\circ\text{C}$

**Table 2. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thJ-C}$	Thermal resistance junction-case max	0.625	$^\circ\text{C}/\text{W}$

## 2 Electrical characteristics

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

**Table 3. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector cut-off current ( $V_{BE} = 0$ )	$V_{CE} = 1700V$ $V_{CE} = 1700V; T_C = 125^{\circ}C$			0.2 2	mA mA
$I_{EBO}$	Emitter cut-off current ( $I_C = 0$ )	$V_{EB} = 5V$			10	$\mu A$
$V_{CEO(sus)}^{(1)}$	Collector-emitter sustaining voltage ( $I_B = 0$ )	$I_C = 10mA$	800			V
$V_{EBO}^{(1)}$	Emitter-base saturation voltage ( $I_C = 0$ )	$I_E = 10mA$	10			V
$V_{CE(sat)}^{(1)}$	Collector-emittersaturation voltage	$I_C = 12A; I_B = 3A$			3	V
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 12A; I_B = 3A$		0.95	1.5	V
$h_{FE}$	DC current gain	$I_C = 1A; V_{CE} = 5V$ $I_C = 12A; V_{CE} = 5V$	5.5	30	8.5	
$t_s$ $t_f$	Inductive load Storage time Fall time	$I_C = 12A; I_{B(on)} = 1.8A$ $I_{B(off)} = -7.25A;$ $V_{CE(fly)} = 1320V;$ $V_{BE(off)} = -2.7V;$ $L_{BB(on)} = 0.8\mu H;$ $f_H = 31520Hz$		3 300	3.6 450	$\mu s$ ns
$t_s$ $t_f$	Inductive load Storage time Fall time	$I_C = 6.5A; I_{B(on)} = 1.1A$ $I_{B(off)} = -5.25A;$ $V_{CE(fly)} = 1220V;$ $V_{BE(off)} = -2.7V;$ $L_{BB(on)} = 0.25\mu H;$ $f_H = 100kHz$		1.6 110	2 220	$\mu s$ ns

1. Pulsed: pulse duration = 300 $\mu s$ , duty cycle < 2%

## 2.1 Electrical characteristics (curve)

Figure 1. Safe operating area

Figure 2. Derating curve

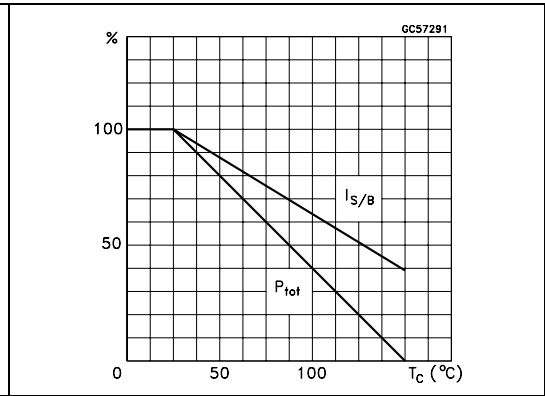
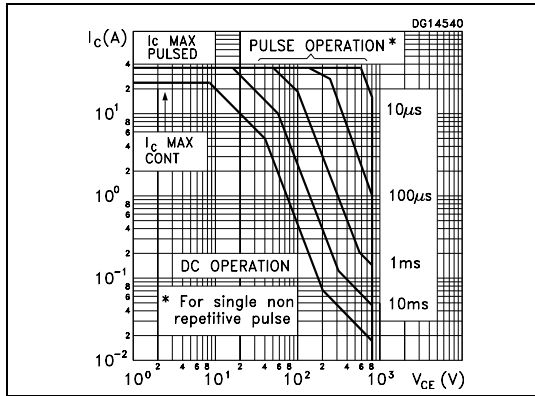


Figure 3. Output characteristics

Figure 4. Reverse biased SOA

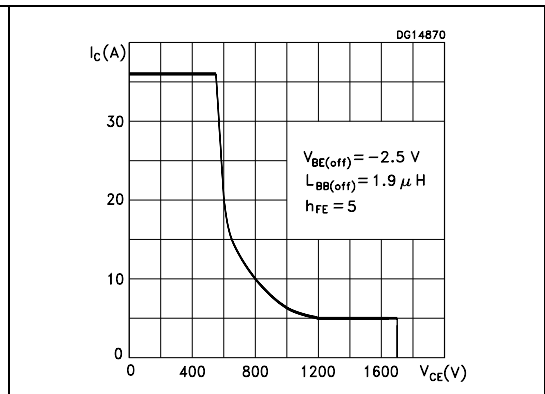
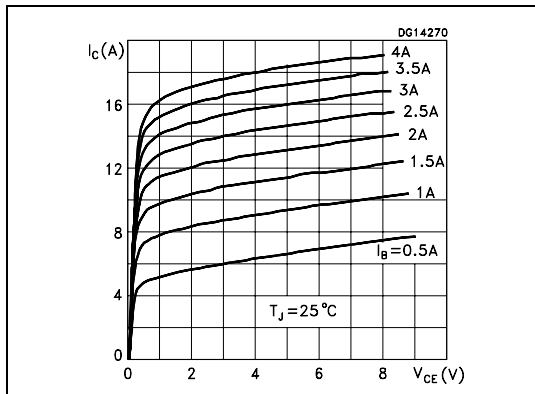


Figure 5. DC current gain

Figure 6. DC current gain

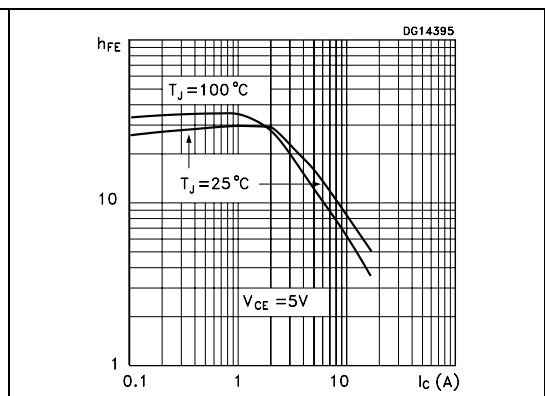
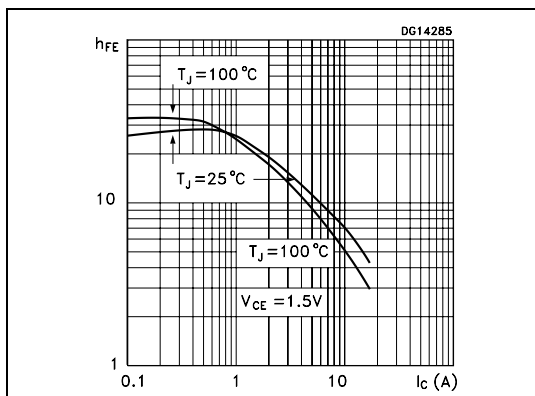


Figure 7. Collector-emitter saturation voltage

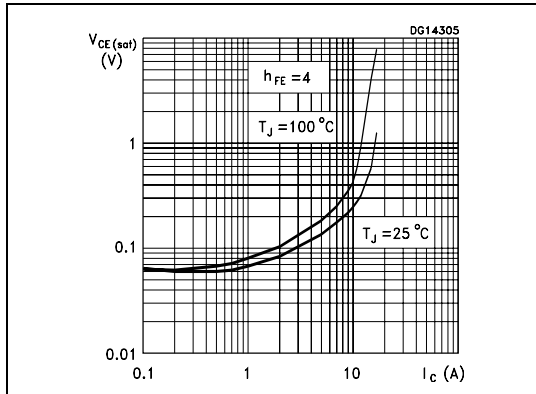


Figure 8. Base-emitter saturation voltage

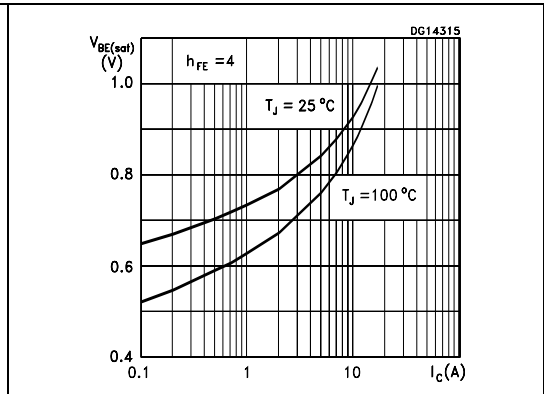


Figure 9. Power losses

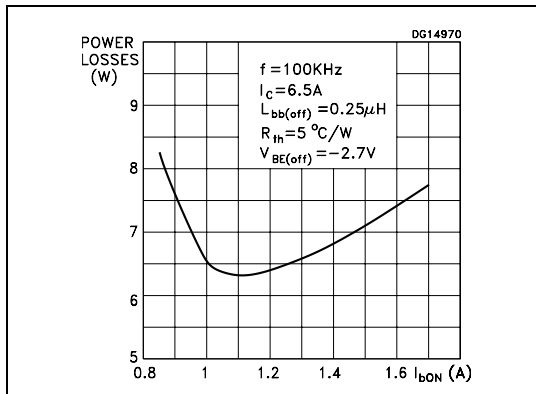


Figure 10. Power losses

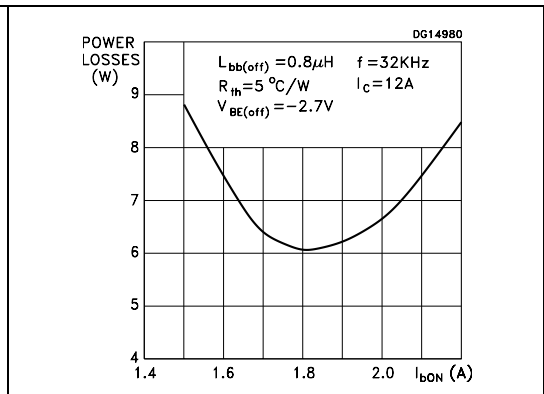


Figure 11. Inductive load switching time

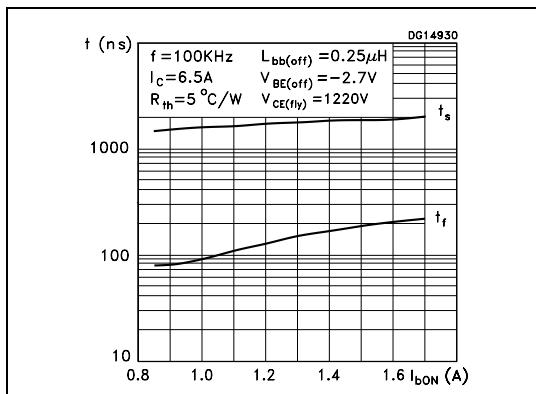
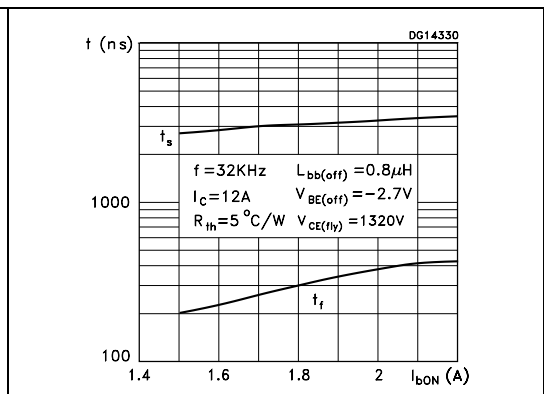


Figure 12. Inductive load switching time



### 3 Test circuit

Figure 13. Power losses and inductive load switching test circuit

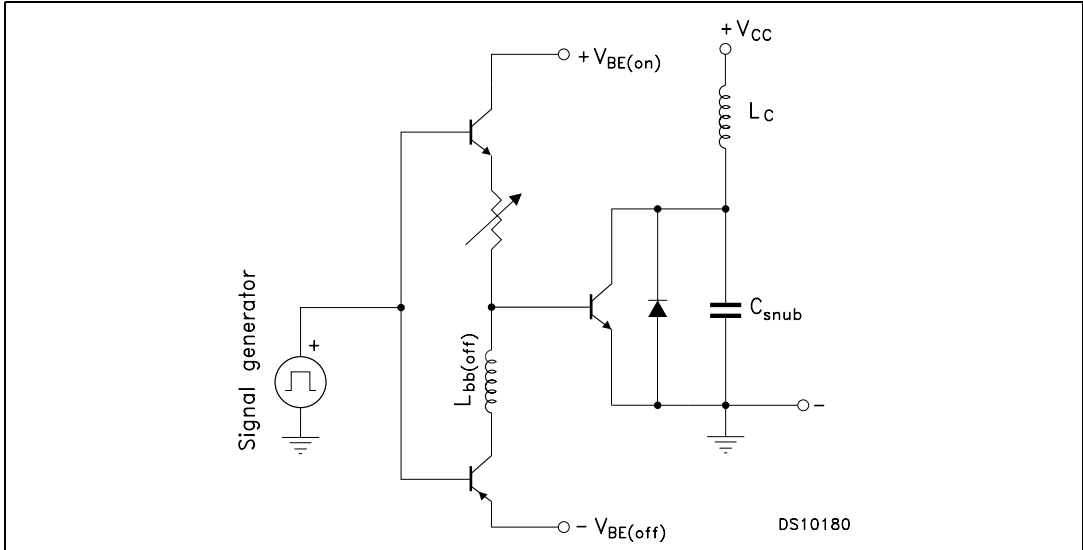
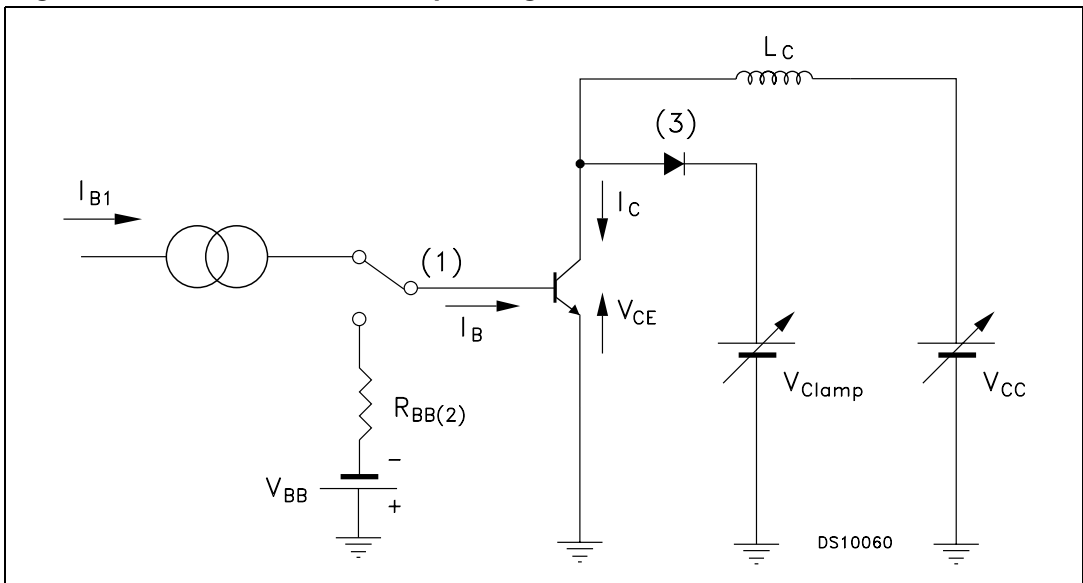


Figure 14. Reverse biased safe operating area test circuit



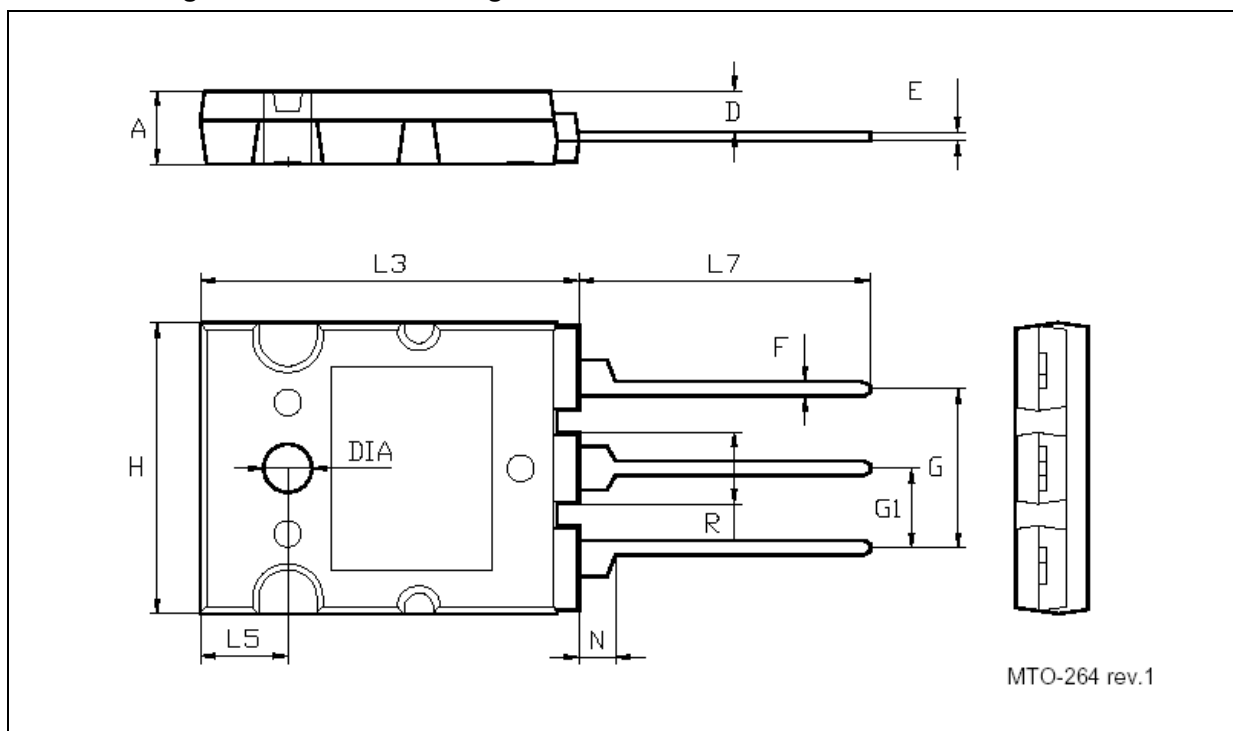
## 4 Package mechanical data

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](http://www.st.com)

Table 4. 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 5. Revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
12-Oct-2006	1	Initial release.
17-Oct-2005	2	Final document
23-Feb-2007	3	The document has been reformatted

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