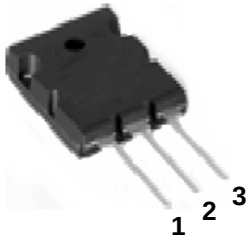
HD1750JL

High Voltage NPN Power Transistor for High Definition and New Super-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

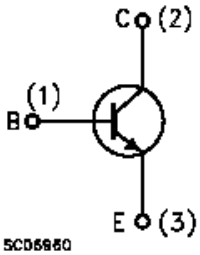


TO-264

Applications

- HORIZONTAL DEFLECTION OUTPUT FOR DIGITAL TV, HDTV AND HIGH -END MONITORS

Internal Schematic Diagram



Description

The device uses a Diffused Collector in Planar technology which adopts ”Enhanced High Voltage Structure” (EHVS1) that was developed to fit High-Definition CRT displays.

The new HD product series features improved silicon efficiency, bringing updated performance to Horizontal Deflection output stages.

Order codes

Part Number	Marking	Package	Packing
HD1750JL	HD1750JL	TO-264	TUBE

1 Electrical ratings

Table 1. 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	24	A
I_{CM}	Collector Peak Current (t_P < 5ms)	36	A
I_B	Base Current	12	A
I_{BM}	Base Peak Current (t_P < 5ms)	18	A
P_{TOT}	Total dissipation at T_c = 25°C	200	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_{thJC}	Thermal Resistance Junction-Case	Max	0.625	°C/W

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} = 1700V V_{CE} = 1700V T_C = 125°C			0.2 2	mA mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5V			10	µA
$V_{CEO(sus)}$ *Note: 1*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 10mA	800			V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	I_E = 10mA	10			V
$V_{CE(sat)}$ *Note: 1*	Collector-Emitter Saturation Voltage	I_C = 12A I_B = 3A			3	V
$V_{BE(sat)}$ *Note: 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 f_h = 31250Hz $I_{B(on)}$ = 1.8A $I_{B(off)}$ = -7.25A $V_{CE(fly)}$ = 1320V $V_{BE(off)}$ = -2.7V $L_{BB(on)}$ = 0.8µH		3 300	3.6 450	µs ns
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	I_C = 6.5A f_h = 100kHz $I_{B(on)}$ = 1.1A $I_{B(off)}$ = -5.25A $V_{CE(fly)}$ = 1220V $V_{BE(off)}$ = -2.7V $L_{BB(on)}$ = 0.25µH		1.6 110	2 220	µs ns

Note: 1 Pulsed duration = 300 µs, duty cycle ≤1.5%.

2.1 Electrical Characteristics (Curves)

Figure 1. Safe Operating Area

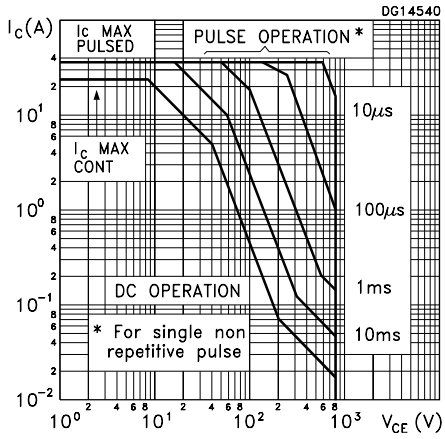


Figure 2. Derating Curve

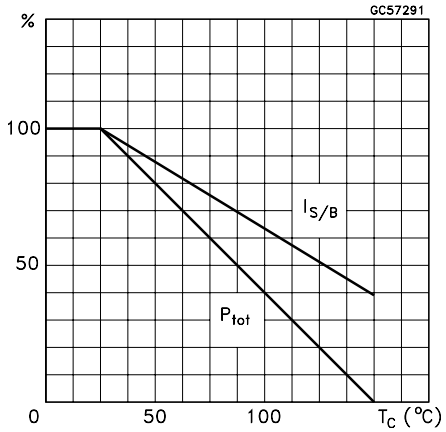


Figure 3. Output Characteristics

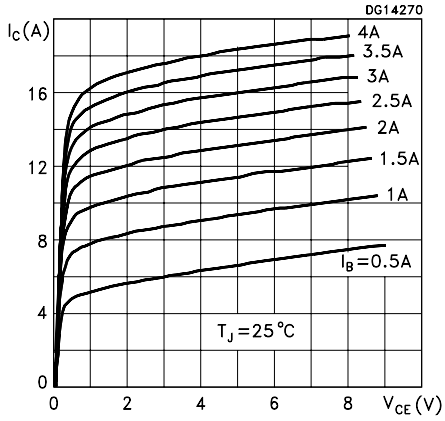


Figure 4. Reverse Biased SOA

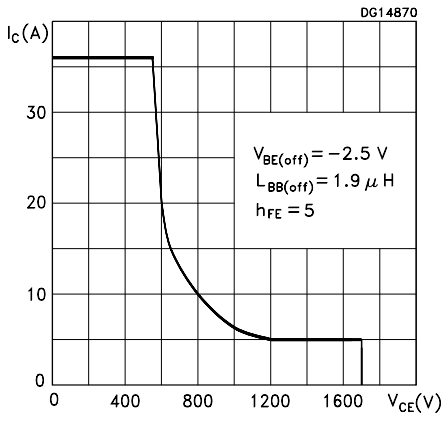


Figure 5. DC Current Gain

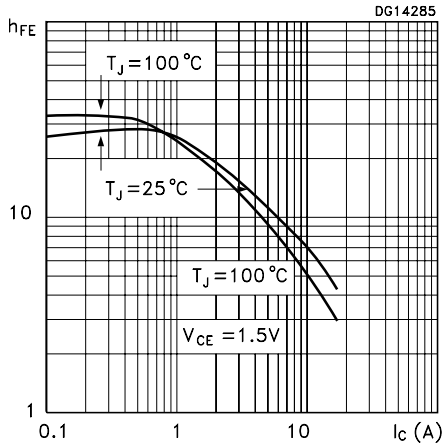


Figure 6. DC Current Gain

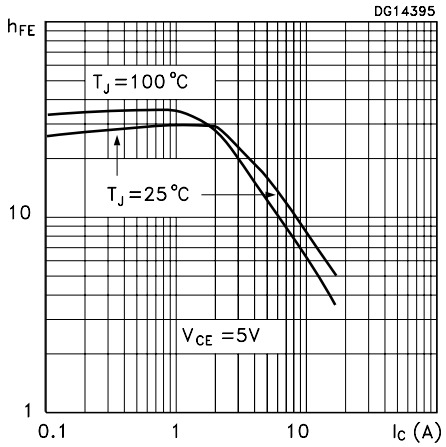


Figure 7. Collector-Emitter Saturation Voltage

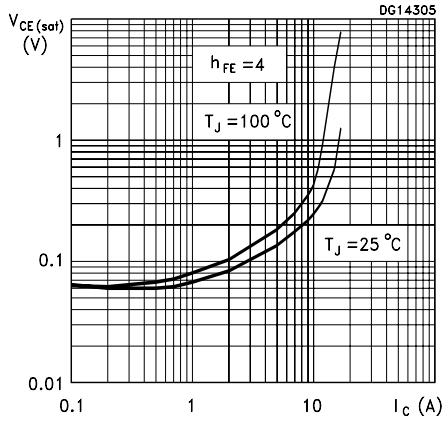


Figure 8. Base-Emitter Saturation Voltage

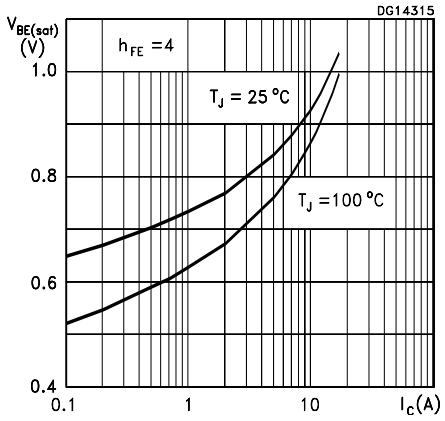


Figure 9. Power Losses

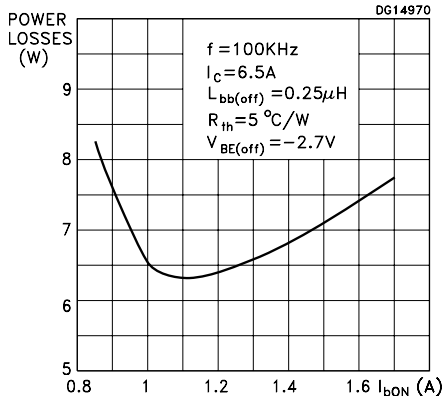


Figure 10. Power Losses

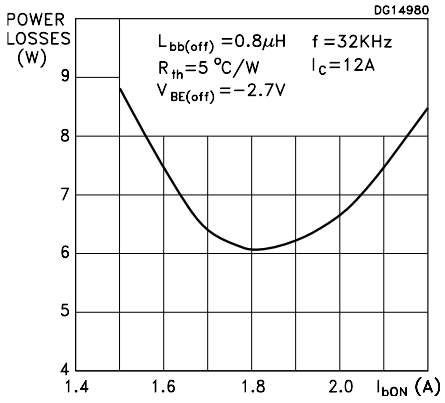


Figure 11. Inductive Load Switching Time

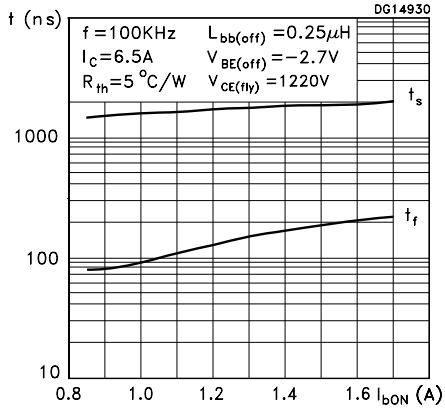
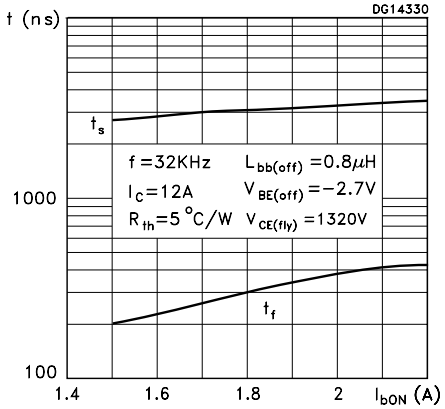


Figure 12. Inductive Load Switching Time



3 Test circuit

Figure 13. Power Losses and Inductive Load Switching Test Circuit

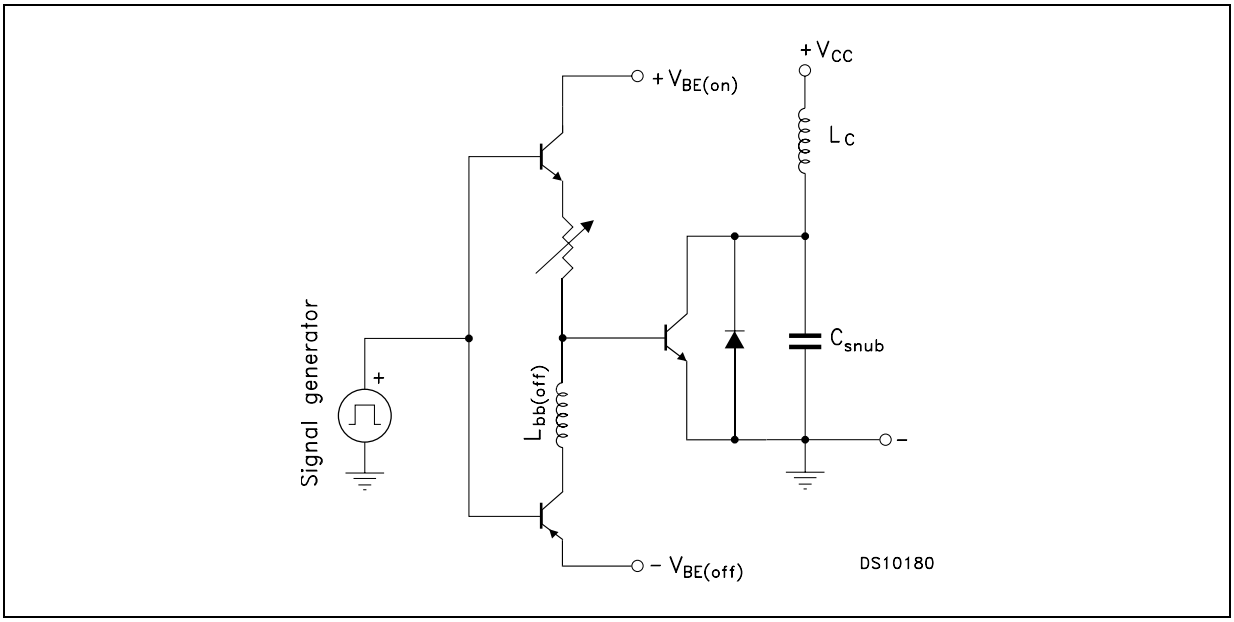
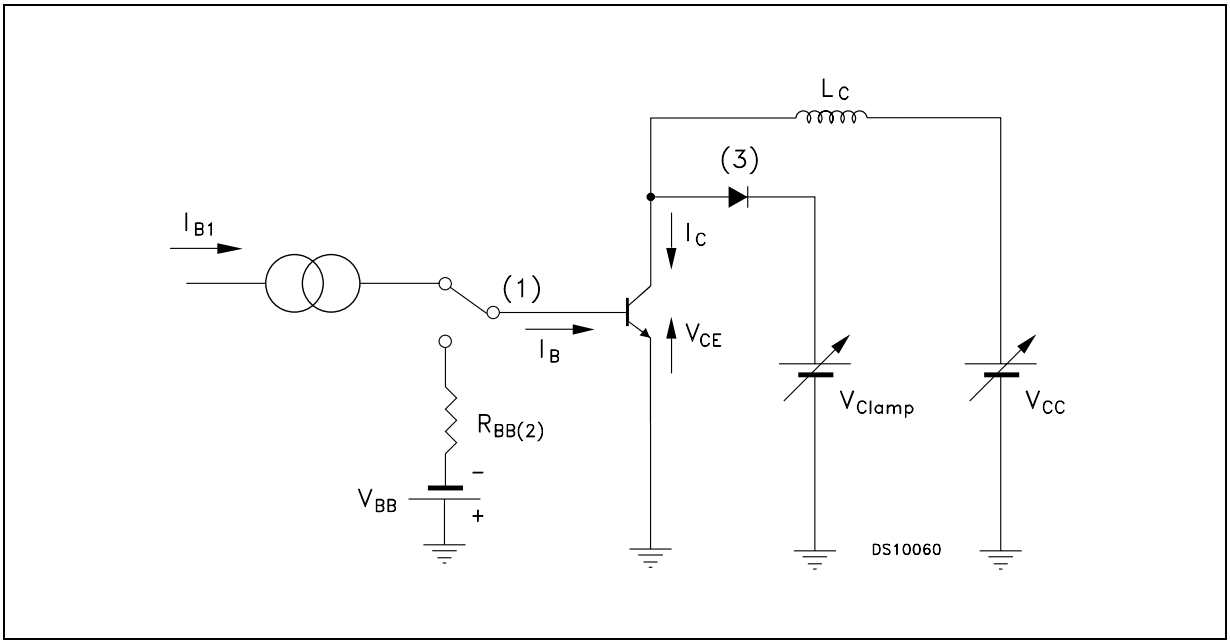


Figure 14. Reverse Biased Safe Operating Area Test Circuit



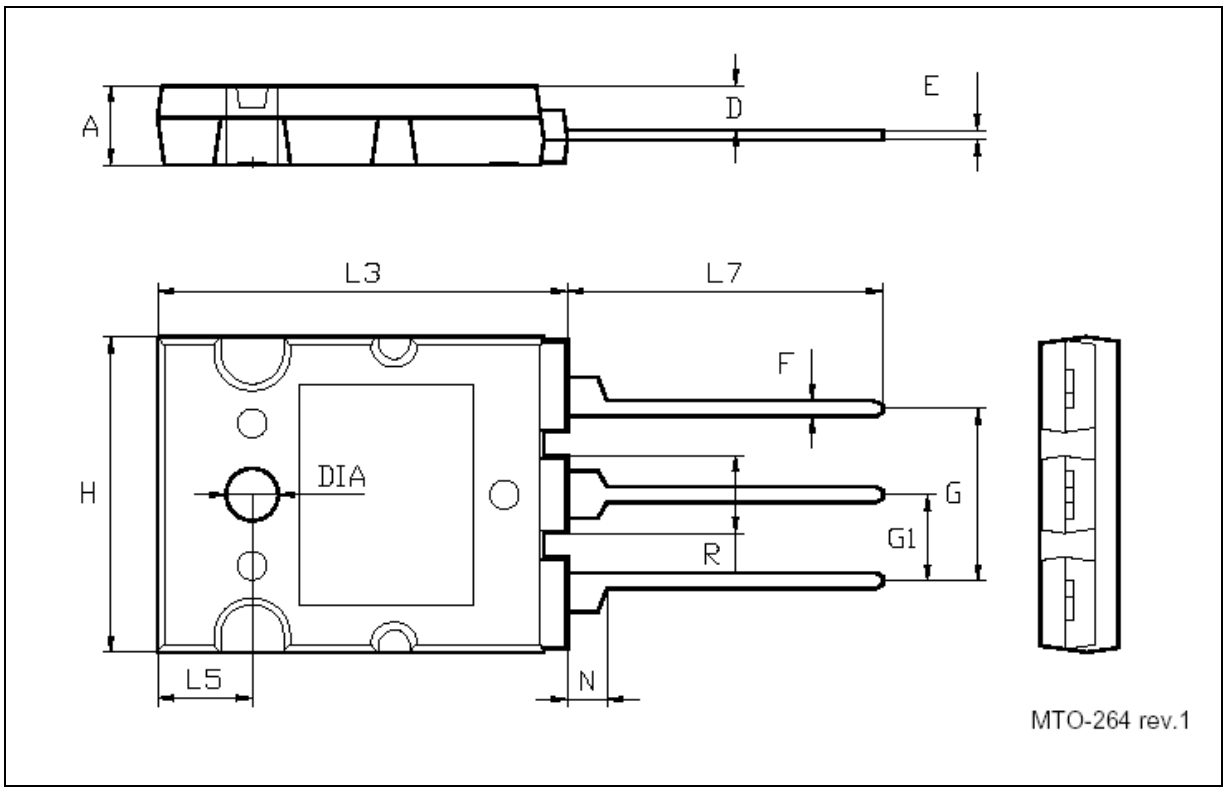
4 Package Mechanical Data

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

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

Date	Revision	Changes
02-May-2005	1	Initial release.
17-Oct-2005	2	Final document.