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HD1750FX

HIGH VOLTAGE NPN POWER TRANSISTOR FOR HIGH DEFINITION AND NEW SUPER-SLIM CRT DISPLAYS

- STATE-OF-THE-ART TECHNOLOGY: DIFFUSED COLLECTOR "ENHANCED GENERATION" EHVS1
- WIDER RANGE OF OPTIMUM DRIVE CONDITIONS
- LESS SENSITIVE TO OPERATING TEMPERATURE VARIATION
- FULLY INSULATED POWER PACKAGE U.L. COMPLIANT

APPLICATIONS

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

DESCRIPTION

The device is manufactured using Diffused Collector in Planar technology adopting "Enhance High Voltage Structure" (EHVS1) developed to fit High-Definition CRT displays.

The new HD product series show improved silicon efficiency bringing updated performance to the Horizontal Deflection stage.

Figure 1: Package

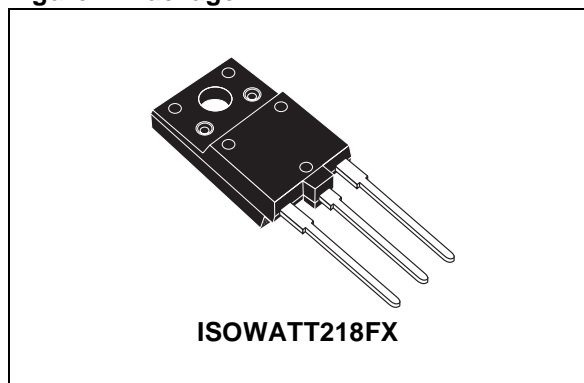


Figure 2: Internal Schematic Diagram

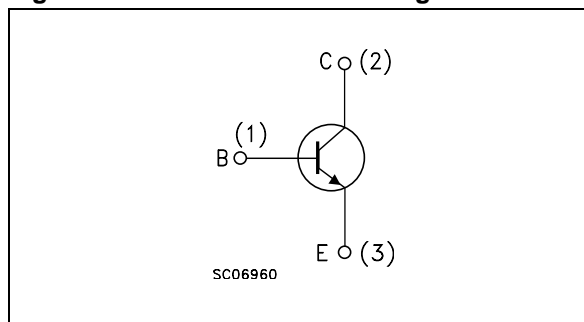


Table 1: Order Codes

Part Number	Marking	Package	Packaging
HD1750FX	HD1750FX	ISOWATT218FX	TUBE

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Table 2: 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 ($t_p < 5ms$)	36	A
I_B	Base Current	12	A
I_{BM}	Base Peak Current ($t_p < 5ms$)	18	A
P_{tot}	Total Dissipation at $T_C = 25\text{ }^\circ\text{C}$	75	W
V_{ins}	Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink	2500	V
T_{stg}	Storage Temperature	-65 to 150	$^\circ\text{C}$
T_J	Max. Operating Junction Temperature	150	$^\circ\text{C}$

Table 3: Thermal Data

$R_{thj-case}$	Thermal Resistance Junction-Case	Max	1.67	$^\circ\text{C/W}$
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Table 4: Electrical Characteristics ($T_{case} = 25\text{ }^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current ($V_{BE} = 0$)	$V_{CE} = 1700\text{ V}$			0.2	mA
		$V_{CE} = 1700\text{ V}$ $T_C = 125\text{ }^\circ\text{C}$			2	mA
I_{EBO}	Emitter Cut-off Current ($I_C = 0$)	$V_{EB} = 5\text{ V}$			10	μA
$V_{CEO(sus)}^*$	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
$V_{CE(sat)}^*$	Collector-Emitter Saturation Voltage	$I_C = 12\text{ A}$ $I_B = 3\text{ A}$			3	V
$V_{BE(sat)}^*$	Base-Emitter Saturation Voltage	$I_C = 12\text{ A}$ $I_B = 3\text{ A}$		0.95	1.5	V
h_{FE}	DC Current Gain	$I_C = 1\text{ A}$ $V_{CE} = 5\text{ V}$		30		
		$I_C = 12\text{ A}$ $V_{CE} = 5\text{ V}$	6.5		9.5	
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 12\text{ A}$ $f_h = 31250\text{ Hz}$				
		$I_{B(on)} = 1.9\text{ A}$ $I_{B(off)} = -8.1\text{ A}$ $V_{CE(fly)} = 1320\text{ V}$ $V_{BE(off)} = -2.7\text{ V}$ $L_{BB(off)} = 0.8\text{ }\mu\text{H}$		3.1 350	3.8 500	μs ns
t_s t_f	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 6.5\text{ A}$ $f_h = 100\text{ kHz}$				
		$I_{B(on)} = 1.2\text{ A}$ $I_{B(off)} = -5.85\text{ A}$ $V_{CE(fly)} = 1220\text{ V}$ $V_{BE(off)} = -2.7\text{ V}$ $L_{BB(off)} = 0.25\text{ }\mu\text{H}$		1.7 180	2 250	μs ns

* Pulsed: Pulsed duration = 300 μs , duty cycle $\leq 1.5\%$.

Figure 3: Safe Operating Area

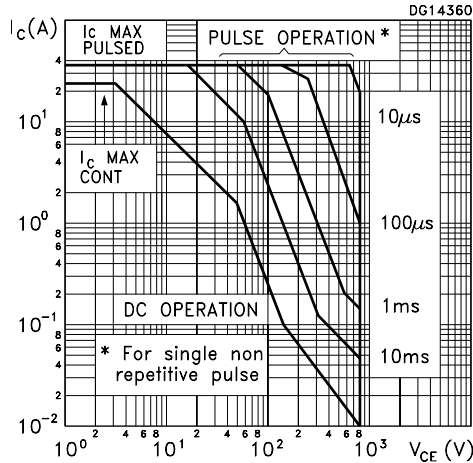


Figure 4: Output Characteristics

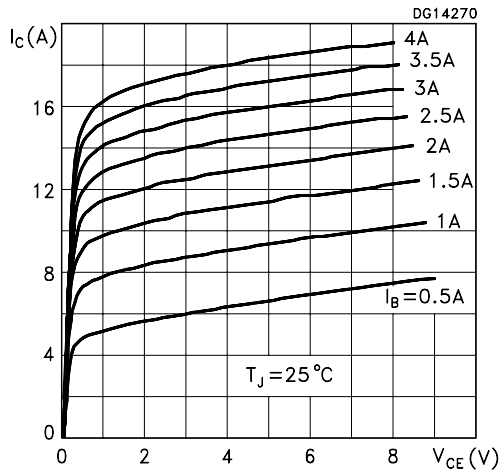


Figure 5: DC Current Gain

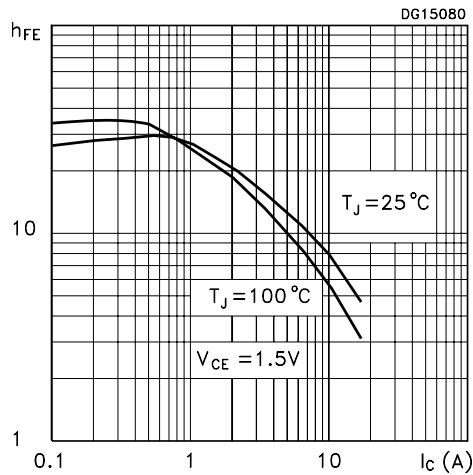


Figure 6: Derating Curve

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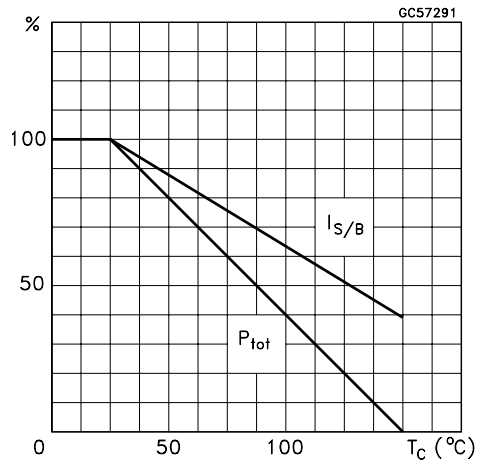


Figure 7: Reverse Biased SOA

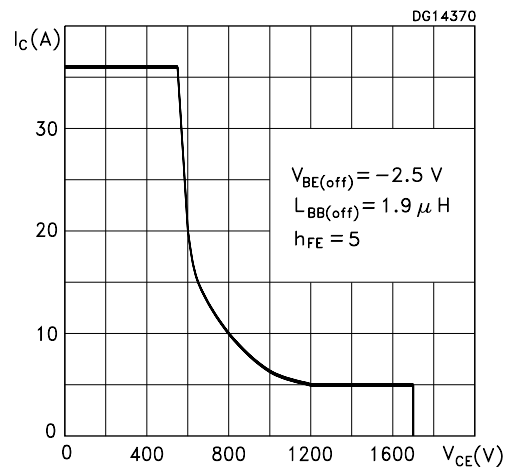
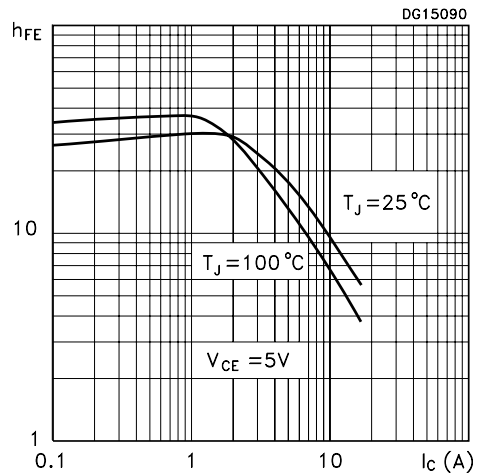


Figure 8: DC Current Gain



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Figure 9: Collector-Emitter Saturation Voltage

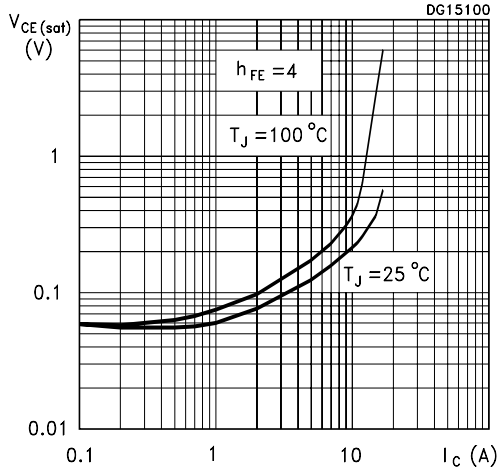


Figure 10: Power Losses

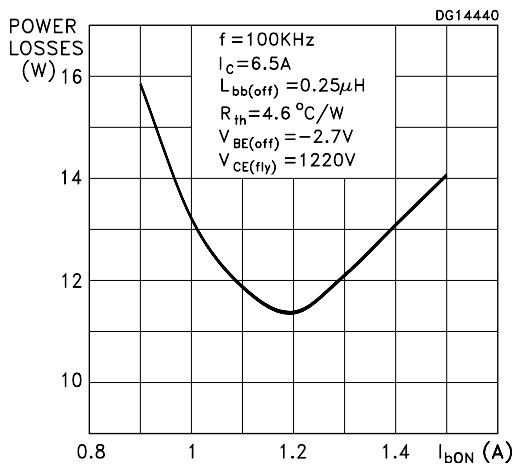


Figure 11: Inductive Load Switching Time

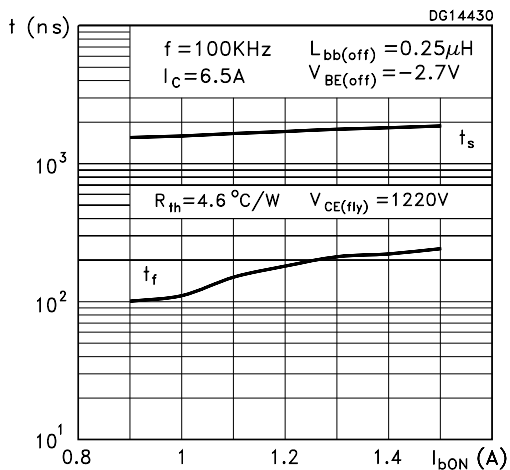


Figure 12: Base-Emitter Saturation Voltage

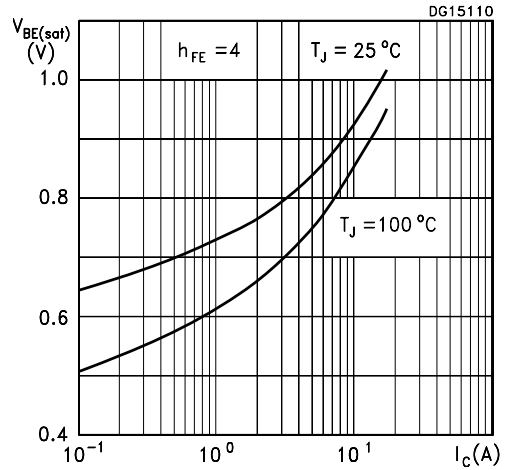


Figure 13: Power Losses

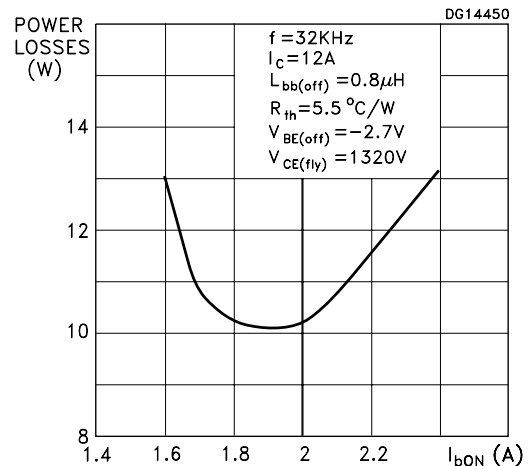


Figure 14: Inductive Load Switching Time

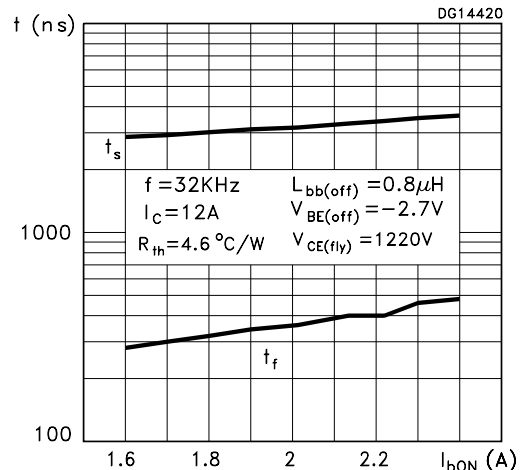


Figure 15: Power Losses and Inductive Load Switching Test Circuit

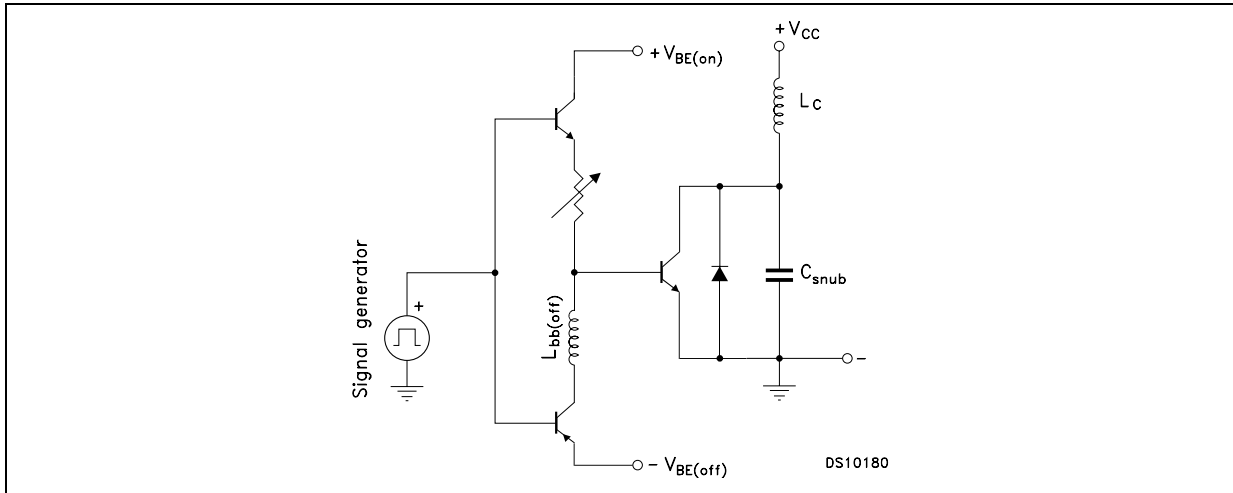
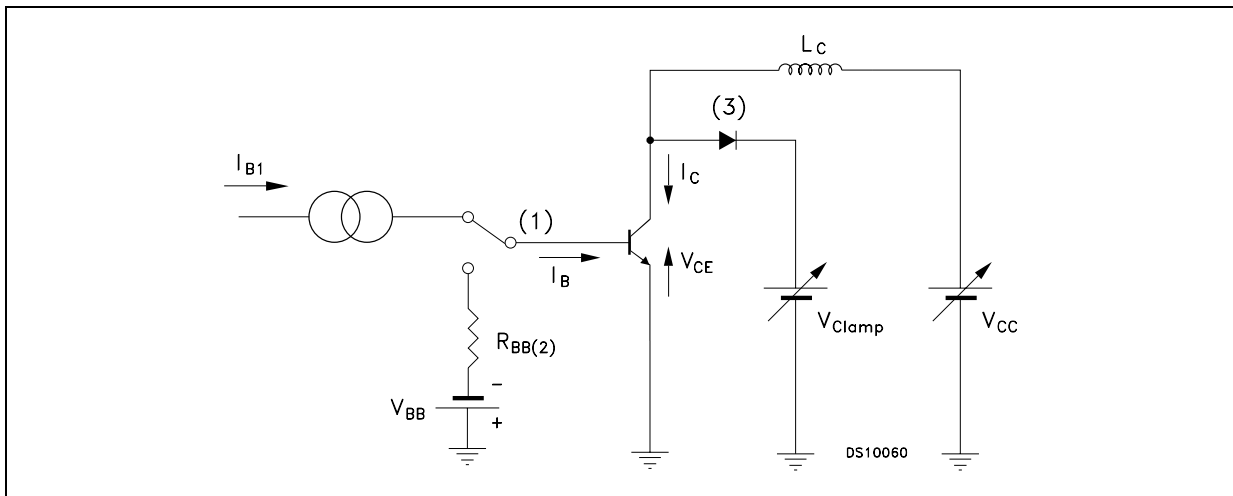


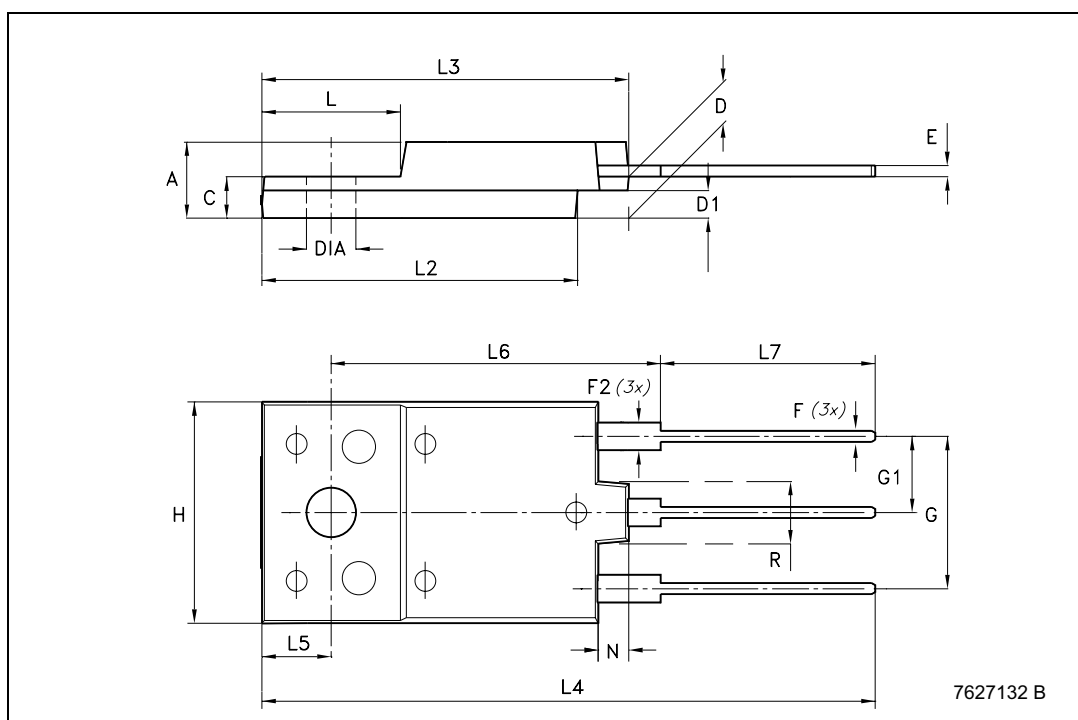
Figure 16: Reverse Biased Safe Operating Area Test Circuit



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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



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Figure 5: Revision History

Release Date	Version	Change Designator
30-May-2005	1	Initial Release.
19-Dec-2005	2	New h_{FE} value in table 4

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