HD1520FX

HIGH VOLTAGE NPN POWER TRANSISTOR FOR HIGH DEFINITION 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

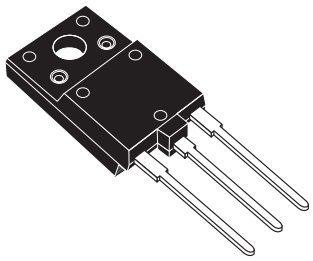
- HORIZONTAL DEFLECTION FOR LARGE AND FLAT SCREEN 100 Hz COLOR TVs

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



ISOWATT218FX

Figure 2: Internal Schematic Diagram

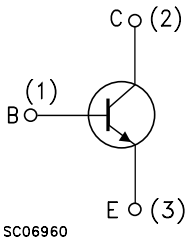


Table 1:

Part Number	Marking	Package	Packaging
HD1520FX	HD1520FX	ISOWATT218FX	TUBE

Table 2: Absolute Maximum 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)	10	V
I_C	Collector Current	15	A
I_{CM}	Collector Peak Current (t_p < 5ms)	22	A
I_B	Base Current	8	A
I_{BM}	Base Peak Current (t_p < 5ms)	12	A
P_{tot}	Total Dissipation at T_C = 25 ^oC	64	W
V_{ins}	Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink	2500	V

Symbol	Parameter	Value	Unit
T_{stg}	Storage Temperature	-65 to 150	°C
T_J	Max. Operating Junction Temperature	150	°C

Table 3: Thermal Data

$R_{thj\text{-}case}$	Thermal Resistance Junction-Case	Max	1.95	°C/W

Table 4: Electrical Characteristics (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CES}	Collector Cut-off Current (V_{BE} = 0)	V_{CE} = 1500 V				0.2	mA
		V_{CE} = 1500 V	T_C = 125 °C			2	mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V				10	µA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA		700			V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	I_E = 10 mA		10			V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 9 A	I_B = 1.8 A			3	V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = 9 A	I_B = 1.8 A			1.3	V
h_{FE}	DC Current Gain	I_C = 1 A	V_{CE} = 5 V		26		
		I_C = 9 A	V_{CE} = 1 V		5		
		I_C = 9 A	V_{CE} = 5 V	5.5		9.5	
	INDUCTIVE LOAD	I_C = 9 A	f_h = 31250 Hz				
t_s	Storage Time	$I_{B(on)}$ = 1.3 A	$I_{B(off)}$ = -4.2 A		3.2	4	µs
t_f	Fall Time	$L_{BB(on)}$ = 1.9 µH	$V_{BE(off)}$ = -2.7 V		220	300	ns
		$V_{CE(fly)}$ = 1040 V					

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

Figure 3: Safe Operating Area

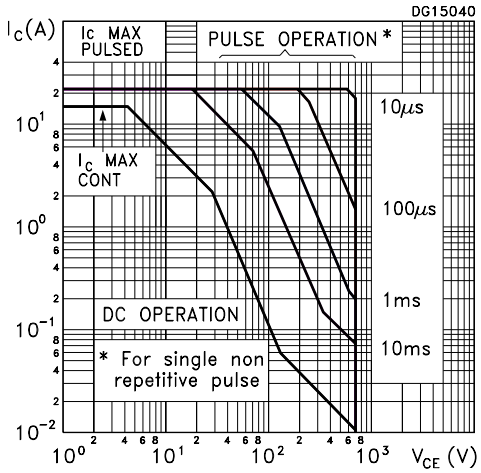


Figure 4: Output Chatacterisctics

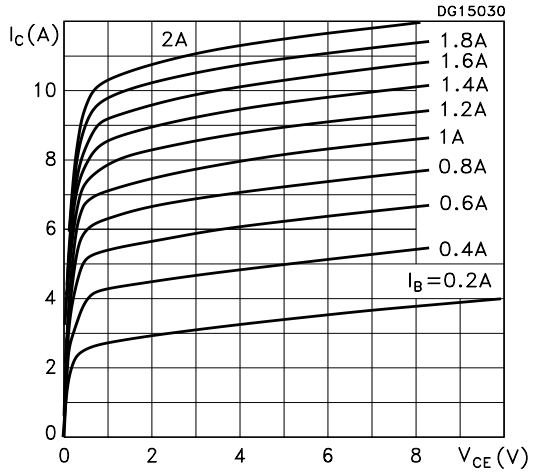


Figure 5: DC Current Gain

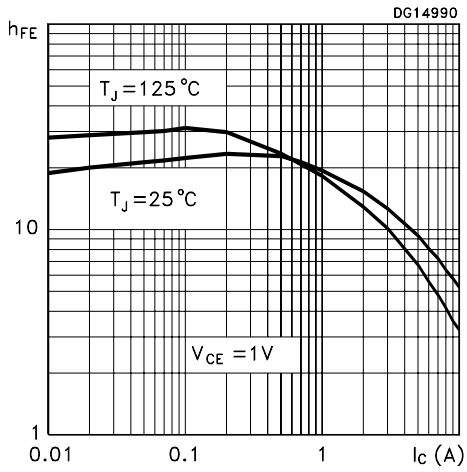


Figure 6: Derating Curve

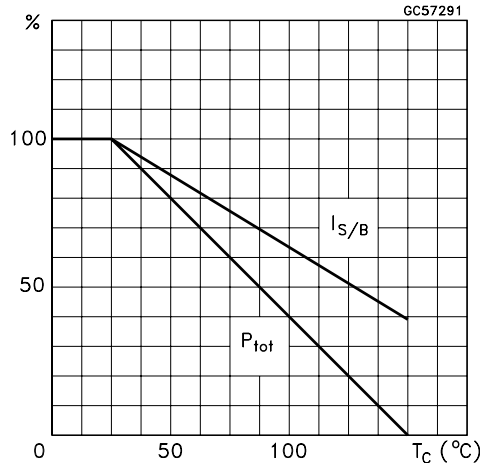


Figure 7: Reverse Biased SOA

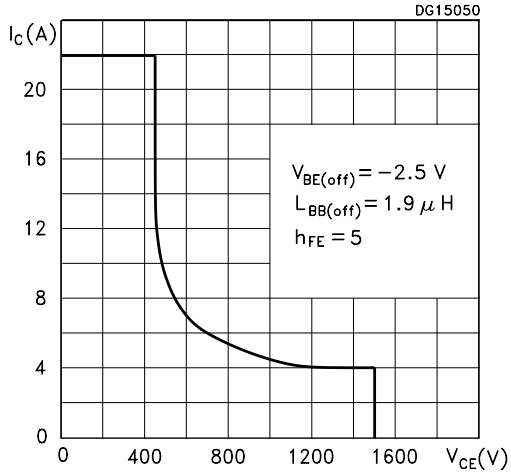


Figure 8: DC Current Gain

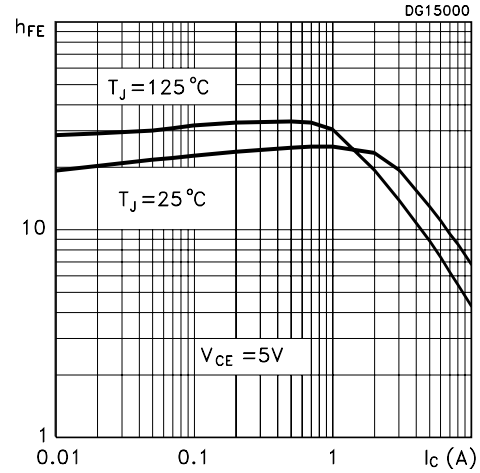


Figure 9: Collector-Emitter Saturation Voltage

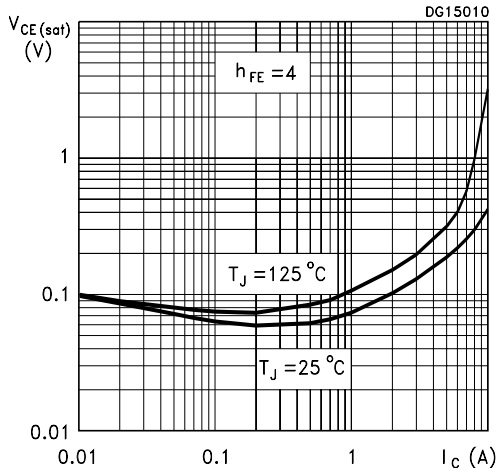


Figure 10: Power Losses

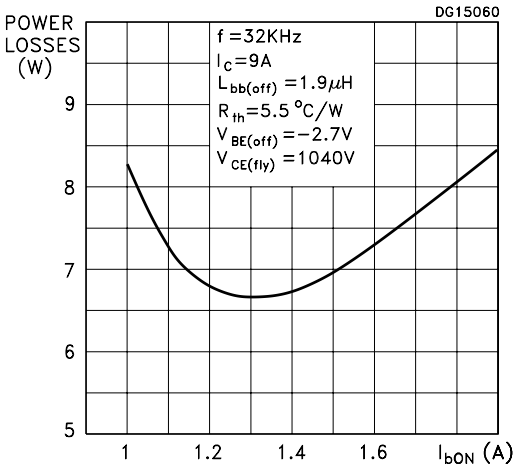


Figure 11: Base-Emitter Saturation Voltage

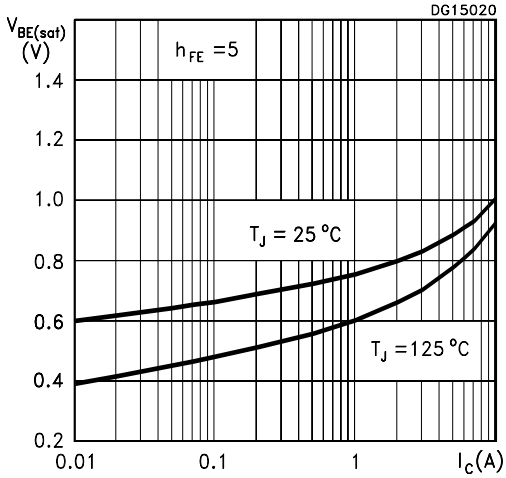


Figure 12: Inductive Load Switching Time

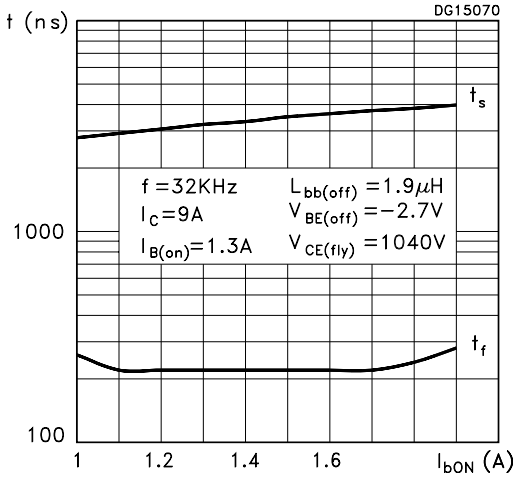


Figure 13: Power Losses and Inductive Load Switching Test Circuit

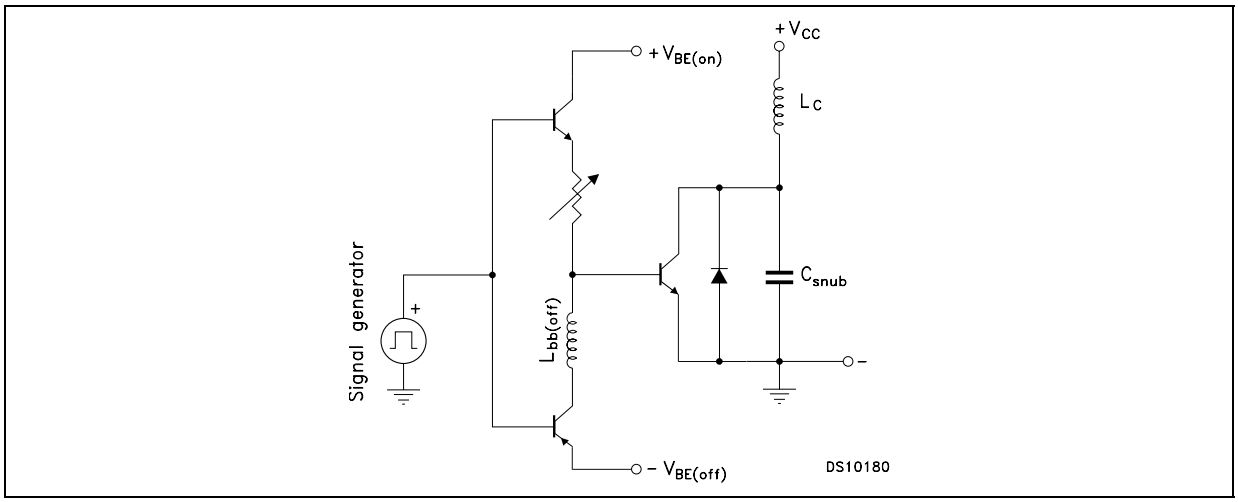
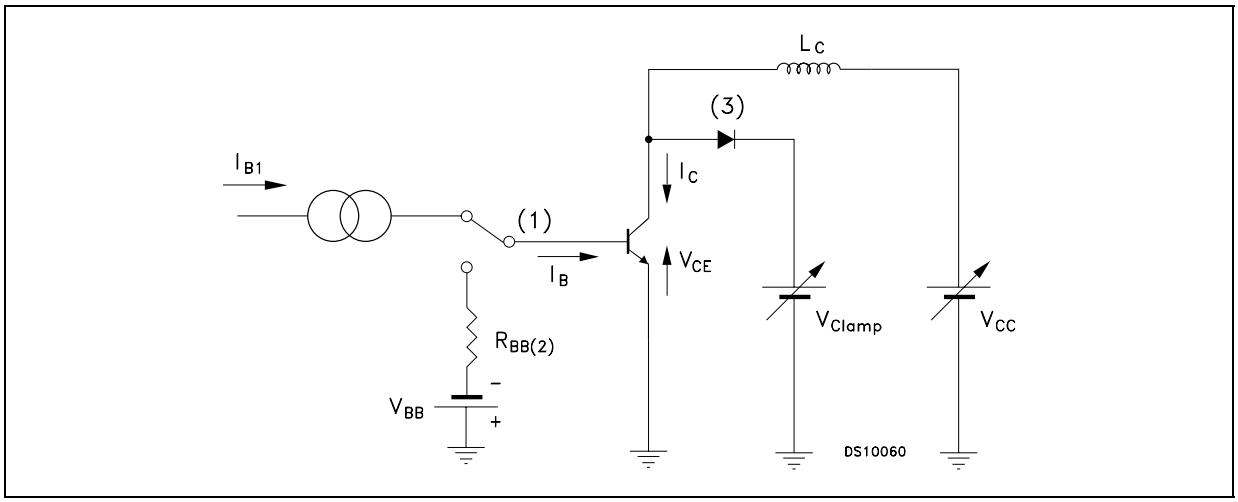
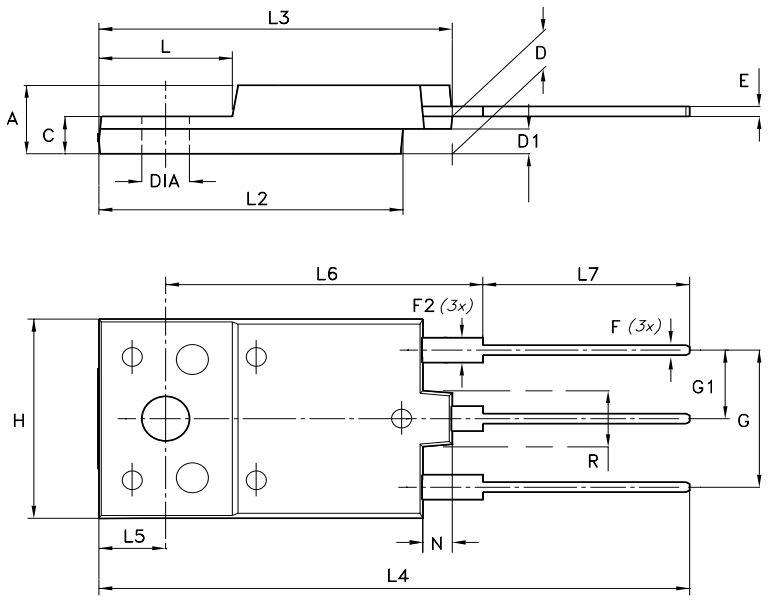


Figure 14: Reverse Biased Safe Operating Area Test Circuit



ISOWATT218FX MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	5.30		5.70	0.209		0.224
C	2.80		3.20	0.110		0.126
D	3.10		3.50	0.122		0.138
D1	1.80		2.20	0.071		0.087
E	0.80		1.10	0.031		0.043
F	0.65		0.95	0.026		0.037
F2	1.80		2.20	0.071		0.087
G	10.30		11.50	0.406		0.453
G1		5.45			0.215	
H	15.30		15.70	0.602		0.618
L	9.0		10.20	0.354		0.402
L2	22.80		23.20	0.898		0.913
L3	26.30		26.70	1.035		1.051
L4	43.20		44.40	1.701		1.748
L5	4.30		4.70	0.169		0.185
L6	24.30		24.70	0.957		0.972
L7	14.60		15.00	0.575		0.591
N	1.80		2.20	0.071		0.087
R	3.80		4.20	0.150		0.165
DIA	3.40		3.80	0.134		0.150



- Weight : 5.6 g (typ.)
- Maximum Torque (applied to mounting flange) Recommended: 0.55 Nm; Maximum: 1 Nm
- The side of the dissipator must be flat within 80 μm

Figure 5: Revision History

Version	Release Date	Change Designator
27-May-2005	0.1	Initial Release.