

High Voltage NPN Power Transistor  
for High Definition and New Super-Slim CRT Display

## Features

- 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 WHICH IS U.L COMPLIANT

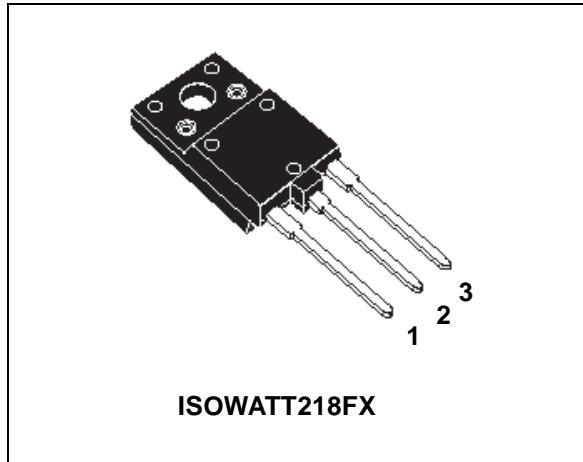
## Applications

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

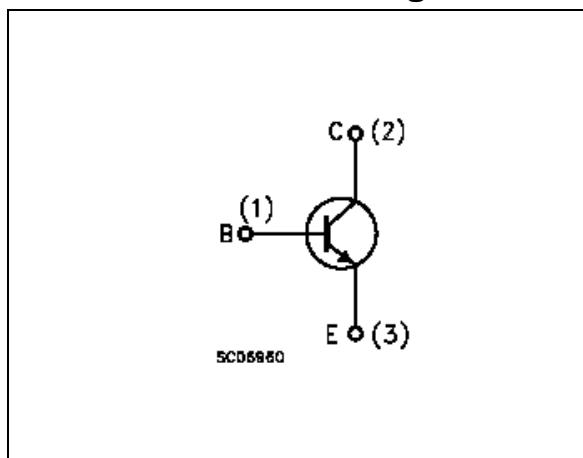
## Description

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.



## Internal Schematic Diagram



## Order Codes

Part Number	Marking	Package	Packing
HD1530FX	HD1530FX	ISOWATT218FX	TUBE

# 1 Absolute Maximum Ratings

**Table 1. 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
$V_{EBO}$	Emitte-Base Voltage ( $I_C = 0$ )	10	V
$I_C$	Collector Current	26	A
$I_{CM}$	Collector Peak Current ( $t_P < 5\text{ms}$ )	40	A
$I_B$	Base Current	10	A
$I_{BM}$	Base Peak Current ( $t_P < 5\text{ms}$ )	20	A
$P_{TOT}$	Total dissipation at $T_c = 25^\circ\text{C}$	70	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

## 1.1 Thermal Data

**Table 2. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{thJC}$	Thermal Resistance Junction-Case	Max	1.8

## 2 Electrical Characteristics

**Table 3. Electrical Characteristics** ( $T_{CASE} = 25^\circ\text{C}$ ; unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$	Collector Cut-off Current ( $V_{BE} = 0$ )	$V_{CE} = 1500\text{V}$ $V_{CE} = 1500\text{V}$ $T_C = 125^\circ\text{C}$			0.2 2	mA mA
$I_{EBO}$	Emitter Cut-off Current ( $I_C = 0$ )	$V_{EB} = 5\text{V}$			10	$\mu\text{A}$
$V_{CEO(sus)}$ <i>Note: 1</i>	Collector-Emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 10\text{mA}$	700			V
$V_{EBO}$	Emitter-Base Voltage	$I_E = 10\text{mA}$	10			V
$V_{CE(sat)}$ <i>Note: 1</i>	Collector-Emitter saturation Voltage	$I_C = 13\text{A}$ $I_B = 3.25\text{A}$			2	V
$V_{BE(sat)}$ <i>Note: 1</i>	Base-Emitter saturation Voltage	$I_C = 13\text{A}$ $I_B = 3.25\text{A}$		1	1.5	V
$h_{FE}$	DC Current Gain	$I_C = 1\text{A}$ $V_{CE} = 5\text{V}$ $I_C = 13\text{A}$ $V_{CE} = 5\text{V}$	5.5	30	9	
$t_s$ $t_f$	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 12\text{A}$ $f_h = 32\text{KHz}$ $I_{B(on)} = 1.4\text{A}$ $I_{B(off)} = -6\text{A}$		3.2 230		$\mu\text{s}$ ns
$t_s$ $t_f$	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 12\text{A}$ $f_h = 48\text{KHz}$ $I_{B(on)} = 2\text{A}$ $I_{B(off)} = -6.7\text{A}$		2.8 200		$\mu\text{s}$ ns
$t_s$ $t_f$	INDUCTIVE LOAD Storage Time Fall Time	$I_C = 6.5\text{A}$ $f_h = 100\text{KHz}$ $I_{B(on)} = 0.8\text{A}$ $I_{B(off)} = -4.5\text{A}$		1.4 100		$\mu\text{s}$ ns

*Note: 1 Pulsed duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1.5\%$ .*

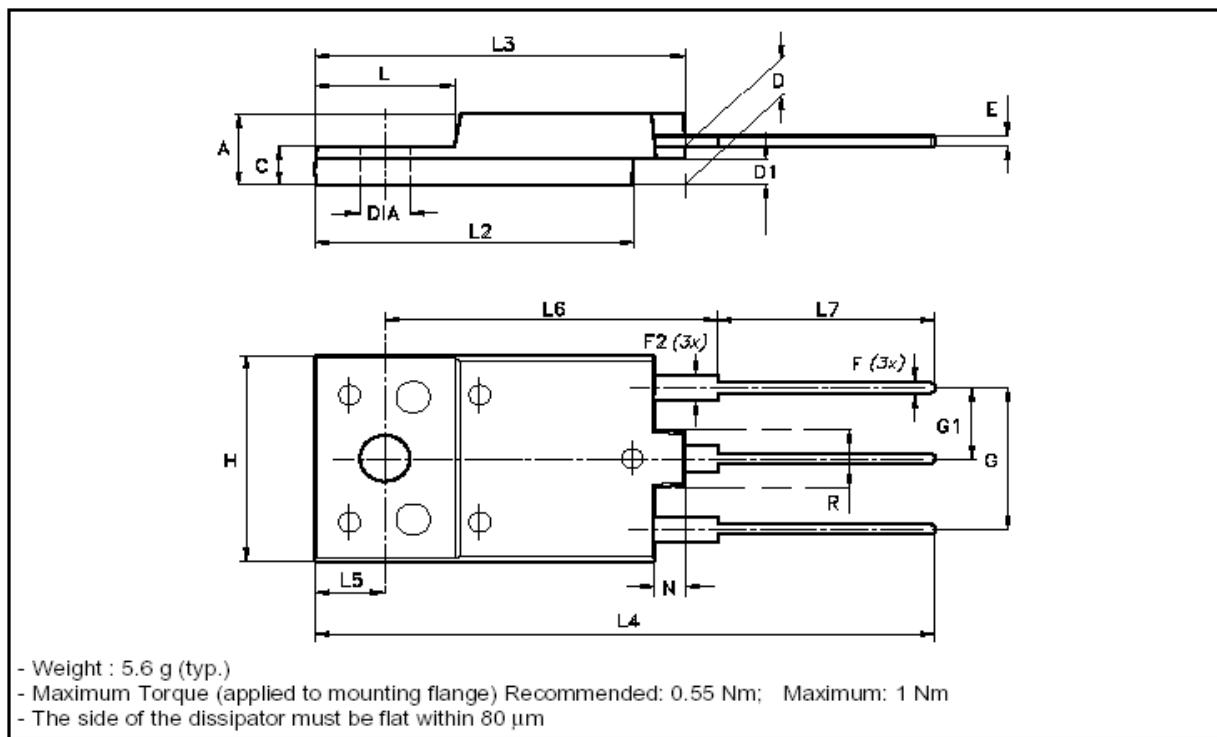
### 3 Package Mechanical Data

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. 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

Figure 1. ISOwatt218FX Drawing



## 4 Revision History

Date	Revision	Changes
05-July-2005	1	Initial release.
25-July-2005	2	New Template, no content change
19-Aug-2005	3	New ECOPACK® label

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