



# STC05IE150HV

Emitter Switched Bipolar Transistor  
ESBT® 1500 V - 5 A - 0.12 Ω

## Features

$V_{CS(ON)}$	$I_C$	$R_{CS(ON)}$
0.6 V	5 A	0.12 Ω

- HIGH VOLTAGE / HIGH CURRENT CASCODE CONFIGURATION
- LOW EQUIVALENT ON RESISTANCE
- VERY FAST-SWITCH, UP TO 150 KHZ
- SQUARED RBSOA, UP TO 1500 V
- VERY LOW  $C_{ISS}$  DRIVEN BY  $R_G = 47 \Omega$
- VERY LOW TURN-OFF CROSS OVER TIME

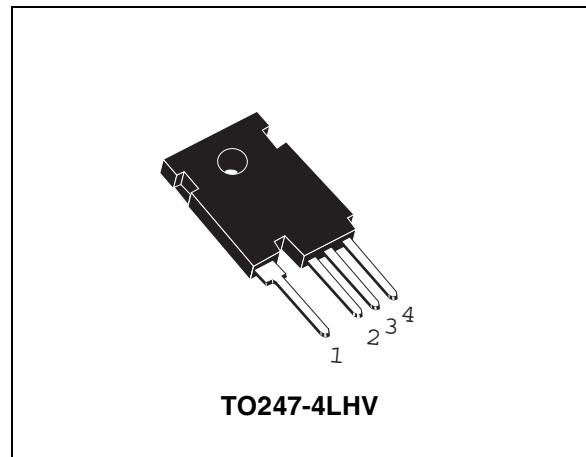
## Application

- FLYBACK / FORWARD SMPS
- BUCK-BOOST CONVERTER

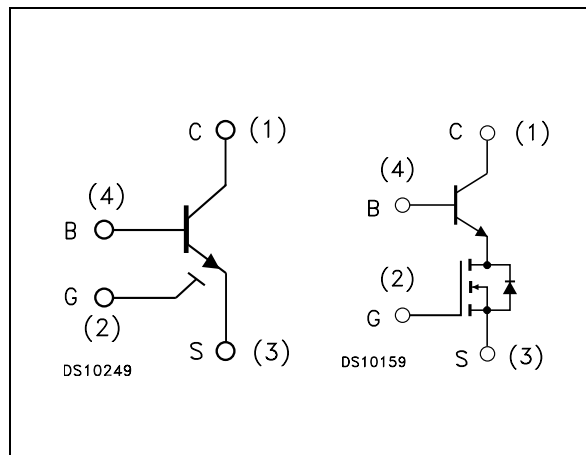
## Description

The STC05IE150HV is manufactured in Monolithic ESBT Technology, aimed to provide best performance in High Frequency / High Voltage Applications. It is designed for use in Gate Driven based topologies.

PRELIMINARY DATA



## Internal Schematic Diagram



## Order Codes

Part Number	Marking	Package	Packing
STC05IE150HV	C05IE150HV	TO247-4LHV	TUBE

# 1 Absolute Maximum Ratings

**Table 1. Absolute Maximum Ratings**

Symbol	Parameter	Value	Unit
$V_{CS(SS)}$	Collector-Source Voltage ( $V_{BS} = V_{GS} = 0$ V)	1500	V
$V_{BS(OS)}$	Base-Source Voltage ( $I_C = 0$ , $V_{GS} = 0$ V)	30	V
$V_{SB(OS)}$	Source-Base Voltage ( $I_C = 0$ , $V_{GS} = 0$ V)	29	V
$V_{GS}$	Gate-Source Voltage	$\pm 17$	V
$I_C$	Collector Current	5	A
$I_{CM}$	Collector Peak Current ( $t_P < 5$ ms)	15	A
$I_B$	Base Current	4	A
$I_{BM}$	Base Peak Current ( $t_P < 1$ ms)	8	A
$P_{tot}$	Total dissipation at $T_c = 25^\circ\text{C}$	208	W
$T_{stg}$	Storage Temperature	-40 to 150	$^\circ\text{C}$
$T_J$	Max. Operating Junction Temperature	150	$^\circ\text{C}$

## 1.1 Thermal Data

**Table 2. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal Resistance Junction-Case	Max 0.6	$^\circ\text{C}/\text{W}$

## 2 Electrical Characteristics

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

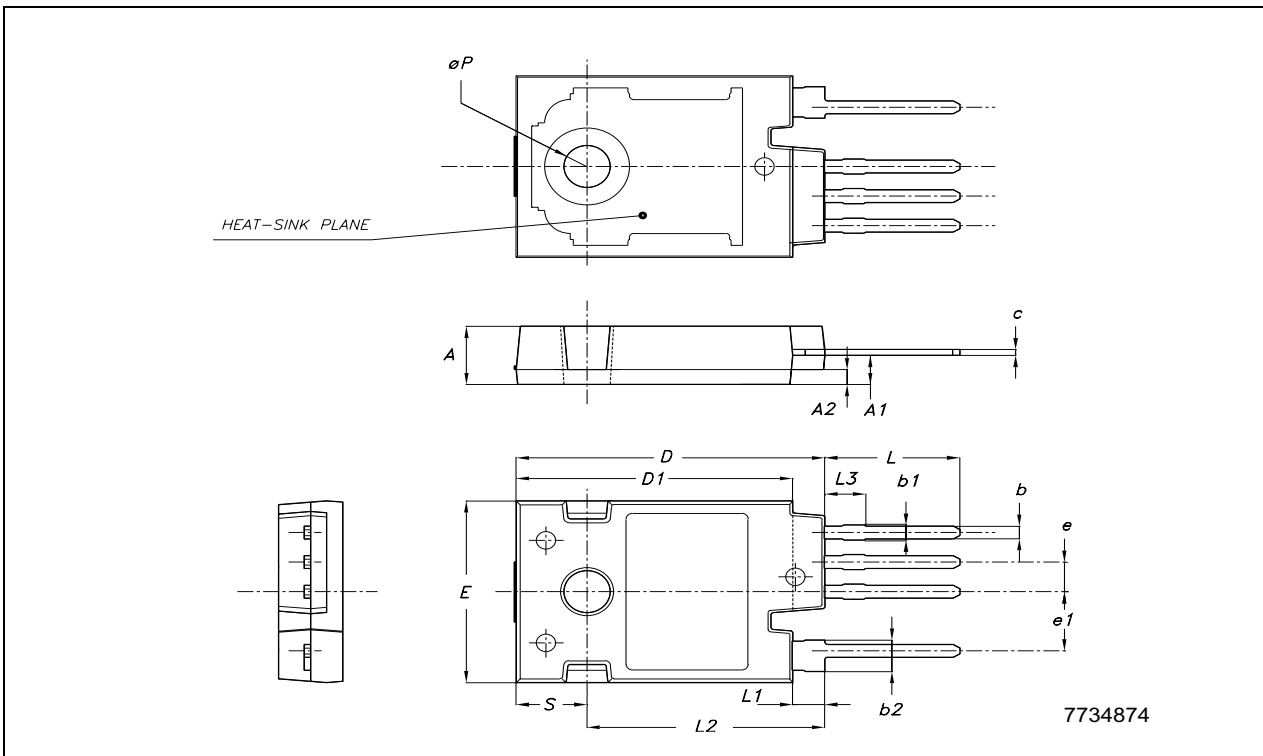
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CS(SS)}$	Collector-Source Current ( $V_{BS} = V_{GS} = 0$ )	$V_{CE} = 1500V$			100	$\mu A$
$I_{BS(OS)}$	Base-Source Current ( $I_C = 0, V_{GS} = 0 V$ )	$V_{BS(OS)} = 30 V$			10	$\mu A$
$I_{SB(OS)}$	Source-Base Current ( $I_C = 0, V_{GS} = 0$ )	$V_{SB(OS)} = 20 V$			100	$\mu A$
$I_{GS(OS)}$	Gate-Source Leakage	$V_{GS} = \pm 17 V$			100	nA
$V_{CS(ON)}$	Collector-Source ON Voltage	$V_{GS} = 10 V \quad I_C = 5 A \quad I_B = 1.0 A$ $V_{GS} = 10 V \quad I_C = 2 A \quad I_B = 0.2 A$		0.6 0.8	1.2 1.5	V V
$h_{FE}$	DC Current Gain	$V_{GS} = 10 V \quad V_{CS} = 1 V \quad I_C = 5 A$ $V_{GS} = 10 V \quad V_{CS} = 1 V \quad I_C = 2 A$	4 8	6 11		
$V_{BS(ON)}$	Base-Source ON Voltage	$V_{GS} = 10 V \quad I_C = 5 A \quad I_B = 1 A$ $V_{GS} = 10 V \quad I_C = 2 A \quad I_B = 0.2 A$		1.3 1.0	1.5 1.2	V V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{BS} = V_{GS} \quad I_B = 250 \mu A$	2	3	4	V
$C_{ISS}$	Input Capacitance	$V_{CS} = 25 V \quad f = 1 MHz$ $V_{GS} = 0$		TBD		pF
$Q_{GS(tot)}$	Gate-Source Charge	$V_{GS} = 10 V$		TBD		nC
$t_s$ $t_f$	INDUCTIVE LOAD Storage Time Fall Time	$V_{GS} = 10 V \quad R_G = 47 \Omega$ $V_{Clamp} = 1200 V \quad t_p = 4 \mu s$ $I_C = 2.5 A \quad h_{FE} = 5$		830 20		ns ns

### 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)

**TO247-4LHV MECHANICAL DATA**

DIM.	mm.		
	MIN.	TYP	MAX.
A	4.85		5.15
A1	2.20	2.50	2.60
A2		1.27	
b	0.95	1.10	1.30
b2	2.50		2.90
c	0.40		0.80
D	23.85	24	24.15
D1		21.50	
E	15.45	15.60	15.75
e	2.54		
e1	5.08		
L	10.20		10.80
L1	2.20	2.50	2.80
L2		18.50	
L3		3	
∅P	3.55		3.65
S		5.50	



## 4 Revision History

Date	Revision	Changes
30-Jan-2006	1	Initial release.

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