STC06IE170HV

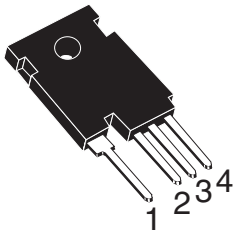
Emitter switched bipolar transistor
ESBT® 1700V - 6A - 0.15Ω

PRELIMINARY DATA

Features

$V_{CS(ON)}$	I_C	$R_{CS(ON)}$
0.7V	6A	0.15Ω

- High voltage / high current cascode configuration
- Low equivalent on resistance
- Very fast-switch, up to 150 kHz
- Squared RBSOA, up to 1700 V
- Very low C_{ISS} driven by R_G = 47Ω
- Very low turn-off cross over time



TO247-4L HV

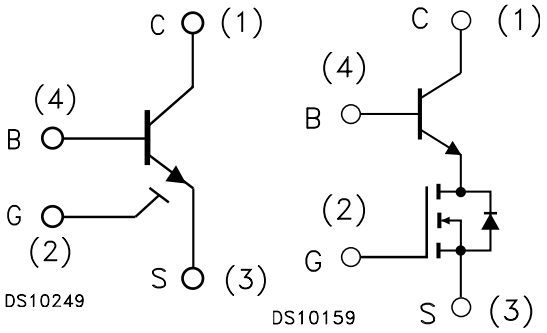
Description

The STC06IE170HV is manufactured in Monolithic ESBT technology, aimed to provide the best performance in High Frequency / High voltage applications. It is designed for use in Gate Driven based topologies.

Application

- Auxiliary SMPS for three phase mains

Internal schematic diagram



Order code

Part number	Marking	Package	Packaging
STC06IE170HV	C06IE170HV	TO247-4L HV	Tube

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_{CS(SS)}$	Collector-source voltage (V_{BS}=V_{GS}=0V)	1700	V
$V_{BS(OS)}$	Base-source voltage (I_C=0, V_{GS}=0V)	30	V
$V_{SB(OS)}$	Source-base voltage (I_C=0, V_{GS}=0V)	17	V
V_{GS}	Gate-source voltage	± 17	V
I_C	Collector current	6	A
I_{CM}	Collector peak current (t_P< 5ms)	15	A
I_B	Base current	6	A
I_{BM}	Base peak current (t_P < 1ms)	15	A
P_{tot}	Total dissipation at $T_c \leq 25°C$	208	W
T_{stg}	Storage temperature	-40 to 150	°C
T_J	Max. operating junction temperature	150	°C

Table 2. Thermal data

Symbol	Parameter	Value	Unit
Rthj-case	Thermal resistance junction-case max	0.6	°C/W

2 Electrical characteristics

(T_{CASE}=25°C unless otherwise specified)

Table 3. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{CS(SS)}$	Collector-source current (V_{BS}=V_{GS}=0V)	$V_{CS(SS)}$=1700V			100	µA
$I_{BS(OS)}$	Base-source current (I_C=0, V_{GS}=0V)	$V_{BS(OS)}$=30V			10	µA
$I_{SB(OS)}$	Source-base current (I_C=0, V_{GS}=0V)	$V_{SB(OS)}$=17V			100	µA
$I_{GS(OS)}$	Gate-source leakage (V_{BS}=0V)	V_{GS} = ±17V			100	nA
$V_{CS(ON)}$	Collector-source ON voltage	V_{GS}=10V; I_C =6; I_B =1.2A V_{GS}=10V; I_C =2; I_B =0.2A		1 0.6		V V
h_{FE}	DC current gain	V_{CS}=1V; V_{GS}=10V; I_C =6A V_{CS}=1V; V_{GS}=10V; I_C =2A		5.5 11		
$V_{BS(ON)}$	Base-source ON voltage	V_{GS}=10V; I_C =6; I_B =1.2A V_{GS}=10V; I_C =2; I_B =0.12A		1.3 0.9		V V
$V_{GS(th)}$	Gate threshold voltage	V_{BS}=V_{GS}; I_B =250µA	2	3	4	V
C_{iss}	Input capacitance	V_{CS}=25V; V_{GS}=0V; f =1MHz		TBD		pF
$Q_{GS(tot)}$	Gate-source charge	V_{GS}=10V		TBD		nC
t_s t_f	Inductive load Storage time Fall time	TBD		TBD		ns
t_s t_f	Inductive load Storage time Fall time	TBD		TBD		ns
$V_{CS(dyn)}$	Collector-source dynamic voltage (500ns)	TBD		TBD		V
$V_{CS(dyn)}$	Collector-source dynamic voltage (1µs)	TBD		TBD		V
V_{CSW}	Maximum collector-source voltage switched without snubber	R_G=47Ω, h_{FE}=5; I_C=6A	1700			V

2.1 Electrical characteristics (curves)

Figure 1. Output characteristics

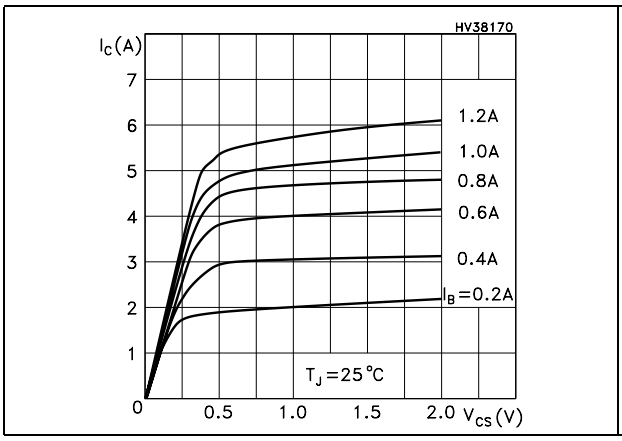


Figure 2. DC current gain

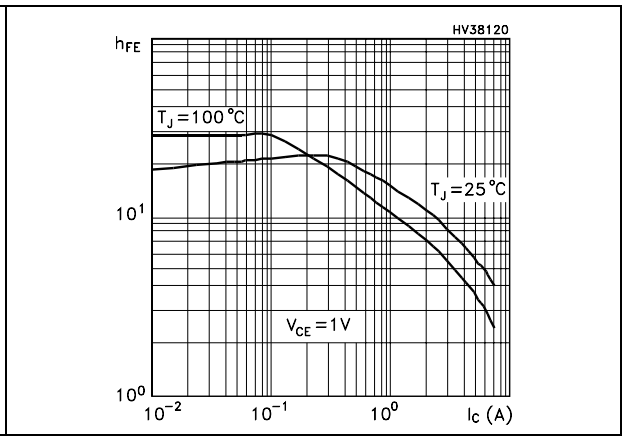


Figure 3. Collector-source on voltage

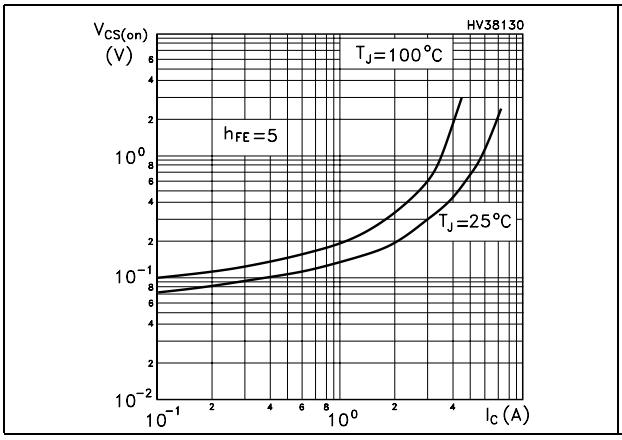


Figure 4. Collector-source on voltage

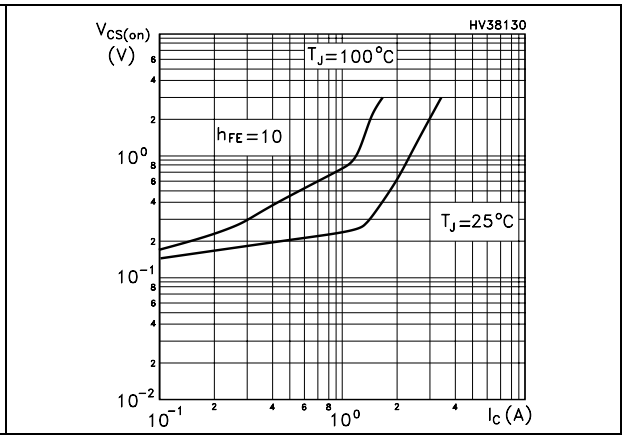


Figure 5. Base-source on voltage

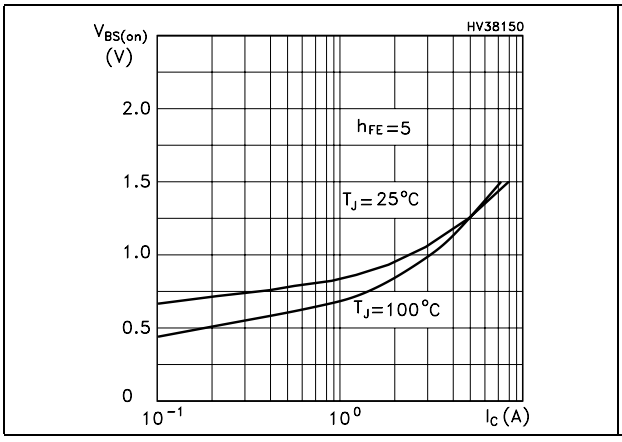
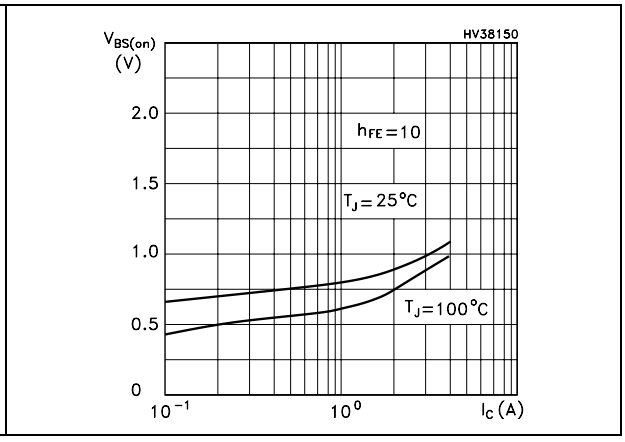


Figure 6. Base-source on voltage

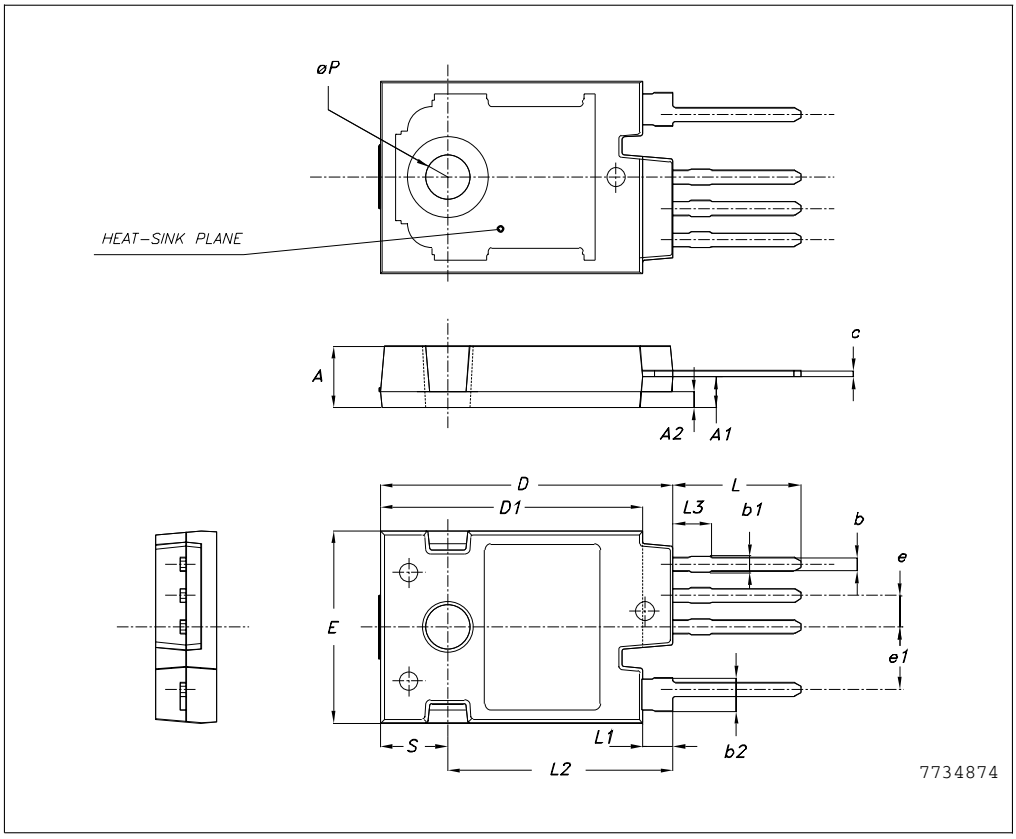


3 Package mechanical data

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*

TO247-4L HV 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	
øP	3.55		3.65
S		5.50	



4 Revision history

Table 4. Revision history

Date	Revision	Changes
11-May-2007	1	First version
21-May-2007	2	Base current values changed on *Table 1*

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