

STC08IE120HP

Preliminary Data

General features

V _{CS(ON)}	۱ _C	R _{CS(ON)}
0.8 V	8 A	0.10 Ω

- High voltage / high current Cascode configuration
- Low equivalent on resistance
- very fast-switch up to 150 kHz
- Squared RBSOA up to 1200V
- Very low C_{iss} driven by $R_G = 47\Omega$
- Very low turn-off cross over time

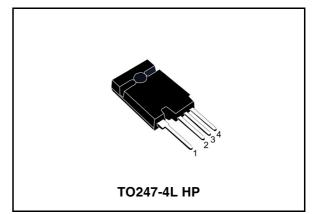
Applications

- Flyback / forward SMPS
- Buck-boost converter

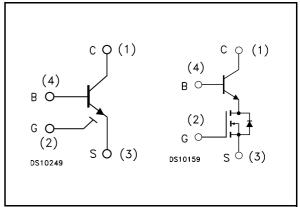
Description

The STC08IE120HP is manufactured in Monolithic ESBT Technology, aimed to provide best performances in high frequency / high voltage applications.

It is designed for use in Gate Driven based topologies.



Internal schematic diagrams



Order codes

Part Number	Marking	Package	Packing
STC08IE120HP	C08IE120HP	TO247-4LHP	Tube

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1 Electrical ratings

Table 1.	Absolute maximum rating

Symbol	Parameter	Value	Unit
V _{CS(SS)}	Collector-source voltage ($V_{BS} = V_{GS} = 0 V$)	1200	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)	17	V
V_{GS}	Gate-source voltage	± 17	V
۱ _C	Collector current	8	Α
I _{CM}	Collector peak current (t _P < 5ms)	24	Α
Ι _Β	Base current	6	Α
I _{BM}	Base peak current (t _P < 5ms)	12	Α
P _{tot}	Total dissipation at $T_c = 25^{\circ}C$	48	W
T _{stg}	Storage temperature	-40 to 150	°C
Т _Ј	Max. operating junction temperature	150	°C

Table 2. Thermal data

Symbol	Parameter	Value	Unit
R _{thj-case}	Thermal resistance junction-case max	2.6	°C/W



2 Electrical characteristics

 $(T_{case} = 25^{\circ}C \text{ unless otherwise specified})$

Table 3. Electrical characteristics						
Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
I _{CS(SS)}	Collector-source current $(V_{BS} = V_{GS} = 0)$	V _{CE} = 1200V			100	μA
I _{BS(OS)}	Base-source current ($I_C = 0, V_{GS} = 0$)	V _{BS(OS)} = 30V			10	μA
I _{SB(OS)}	Source-base current $(I_C = 0, V_{GS} = 0)$	V _{SB(OS)} = 17V			100	μA
I _{GS(OS)}	Gate-source leakage	$V_{GS} = \pm 17V$			100	nA
V _{CS(ON)}	Collector-source ON voltage	$V_{GS} = 10V$ $I_C = 8A$ $I_B = 1.6A$ $V_{GS} = 10V$ $I_C = 4A$ $I_B = 0.4A$		0.8 0.5	1 1.2	V V
h _{FE}	DC current gain	$\begin{array}{ll} V_{GS} = 10V & I_C = 8A & V_{CS} = 1V \\ V_{GS} = 10V & I_C = 4A & V_{CS} = 1V \end{array}$	5 7			
V _{BS(ON)}	Base Source ON voltage	$V_{GS} = 10V I_C = 8A I_B = 1.6A$ $V_{GS} = 10V I_C = 4A I_B = 0.4A$		1.5 1.5		V V
V _{GS(th)}	Gate threshold voltage	$V_{BS} = V_{GS}$ $I_B = 250 \mu A$	2	3	4	V
C _{ISS}	Input capacitance	$V_{CS} = 25V$ f = 1MHz $V_{GS} = 0$		550		pF
Q _{GS(tot)}	Gate-source charge	V _{GS} = 10V		26		nC
t _s t _f	INDUCTIVE LOAD Storage time Fall time	$\begin{split} I_C &= 4A I_B = 0.8A \ V_{GS} = 10V \\ V_{Clamp} &= 960V R_G = 47\Omega \\ t_p &= 4\mu s \end{split}$		670 15		ns ns
t _s t _f	INDUCTIVE LOAD Storage time Fall time	$I_{C} = 4A I_{B} = 0.4A V_{GS} = 10V$ $V_{Clamp} = 960V R_{G} = 47\Omega$ $t_{p} = 4\mu s$		340 10.2		ns ns
V _{CSW}	Maximum collector- source voltage switched without snubber	$R_{G} = 47\Omega$ $h_{FE} = 5A$ $I_{C} = 8A$	1200			V
V _{CS(dyn)}	Collector-source dynamic voltage (500ns)	$\begin{split} & V_{\text{CC}} = V_{\text{Clamp}} = 400V \ V_{\text{GS}} = 10V \\ & R_{\text{G}} = 47\Omega I_{\text{C}} = 4A I_{\text{B}} = 0.8A \\ & I_{\text{Bpeak}} = 4A t_{\text{peak}} = 500ns \end{split}$		5.75		V
V _{CS(dyn)}	Collector-source dynamic voltage (1 μs)	$\begin{split} & V_{CC} = V_{Clamp} = 400V \ V_{GS} = 10V \\ & R_{G} = 47\Omega I_{C} = 4A I_{B} = 0.8A \\ & I_{Bpeak} = 4A t_{peak} = 500ns \end{split}$		3.35		V

 Table 3.
 Electrical characteristics



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Electrical characteristics (curves) 2.1

Output characteristics Figure 1.

Figure 2. DC current gain

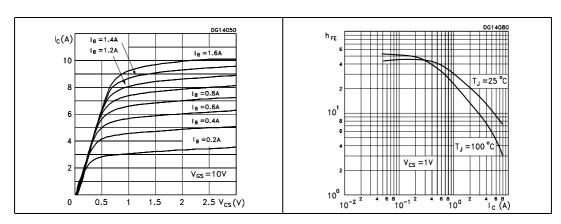
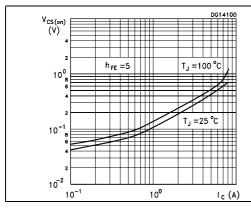


Figure 3. Collector-source On voltage Figure 4. **Collector-source On voltage**

V_{CS(on)} (V)



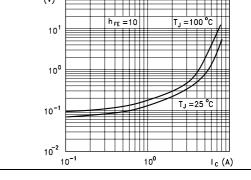


Figure 5. **Base-source On voltage**

Figure 6. **Base-source On voltage**

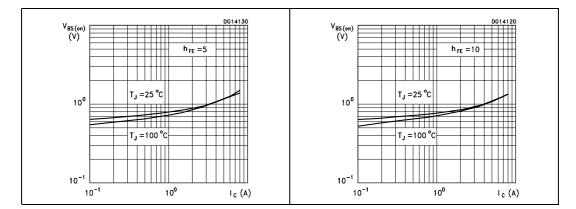




Figure 7.

area DG14065 $I_{C}(A)$ 8 6 4 2 0 400 800 1200 V_{cs}(V)

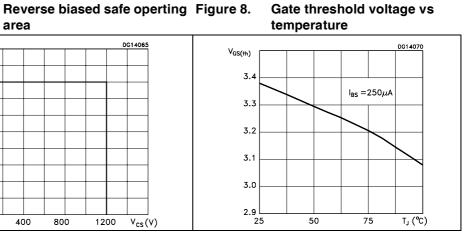
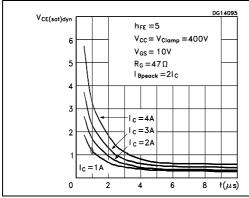
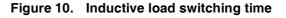


Figure 9. **Dynamic collector-emitter** saturation voltage





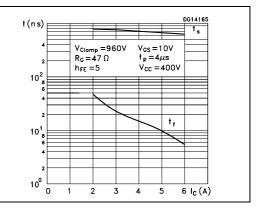
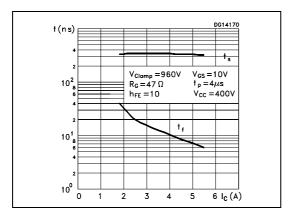


Figure 11. Inductive load switching time





2.2 Test circuits

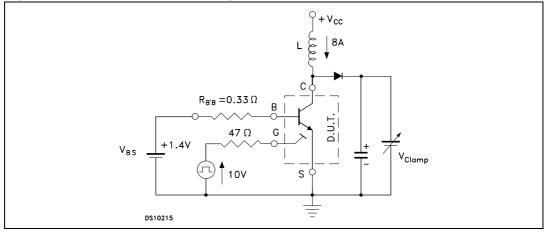


Figure 12. Inductive load switching and RBSOA test circuit

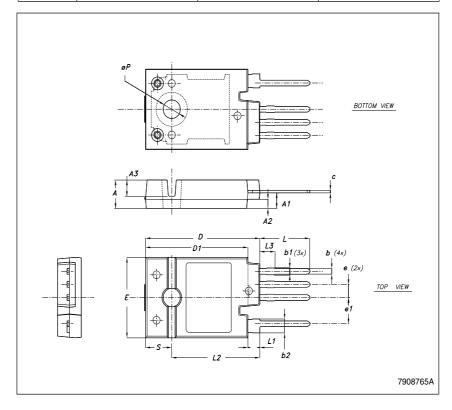
3 Package mechanical data

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



TO247-4LHP MECHANICAL DATA

DIM.		mm.	
	MIN.	ТҮР	MAX.
A	5.50	5.65	5.80
A1	2.85	3.15	3.25
A2		1.92	
A3		3.18	
b	0.95	1.10	1.30
b1	1.10		1.50
b2	2.50		2.90
с	0.40		0.80
D	23.85	24	24.15
D1		21.50	
E	15.45	15.60	15.75
е	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

Date	Revision	Changes
16-Oct-2006	1	Initial release.

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