STE70IE120

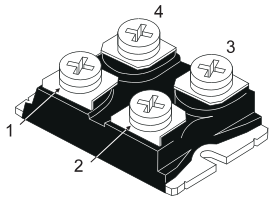
Monolithic Emitter Switched Bipolar Transistor
ESBT® 1200 V - 70 A - 0.014 Ω Power Module

Target data

General features

$V_{CS(ON)}$	I_C	$R_{CS(ON)}$
1V	70A	0.014Ω

- High voltage / high current Cascode configuration
- Ultra low equivalent on resistance
- Very fast-switch, up to 150 kHz
- Ultra low C_{ISS}
- Low dynamic $V_{CS(ON)}$

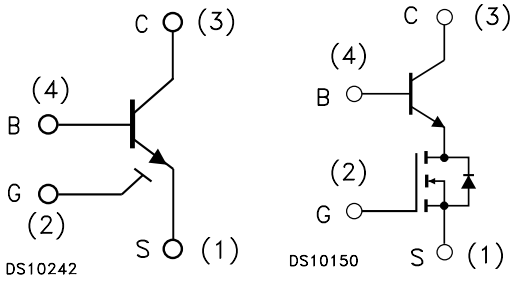


ISOTOP

Description

The STE70DE120 is manufactured in monolithic structure, to be used in industrial applications.

Internal schematic diagram



Applications

- Solar
- Welding

Order codes

Part number	Marking	Package	Packaging
STE70IE120	E70IE120	ISOTOP	Tube

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_{CS(SS)}$	Collector-source voltage (V_{BS} = V_{GS} = 0V)	1200	V
$V_{BS(OS)}$	Base-source voltage (I_C = 0, V_{GS} = 0V)	40	V
$V_{SB(OS)}$	Source-base voltage (I_C = 0, V_{GS} = 0V)	12	V
V_{GS}	Gate-source voltage	± 20	V
I_C	Collector current	70	A
I_{CM}	Collector peak current (t_p < 5ms)	150	A
I_B	Base current	20	A
I_{BM}	Base peak current (t_P < 1ms)	70	A
P_{tot}	Total dissipation at T_C = 25°C	TBD	W
T_{STG}	Storage temperature	-65 to 150	°C
T_J	Maximum operating junction temperature	150	°C
V_{ISO}	Insulation withstand voltage (AC-RMS) from all four leads to external heatsink	2500	V

1.1 Thermal data

Table 2. Thermal data

Symbol	Parameter	Value	Unit
$R_{thJ\text{-}case}$ $R_{thc\text{-}h}$	Thermal resistance junction-case (Max) Thermal resistance case-heatsink with conductive grease applied (Max)	TBD TBD	°C/W °C/W

2 Electrical characteristics

Table 3. Electrical characteristics

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

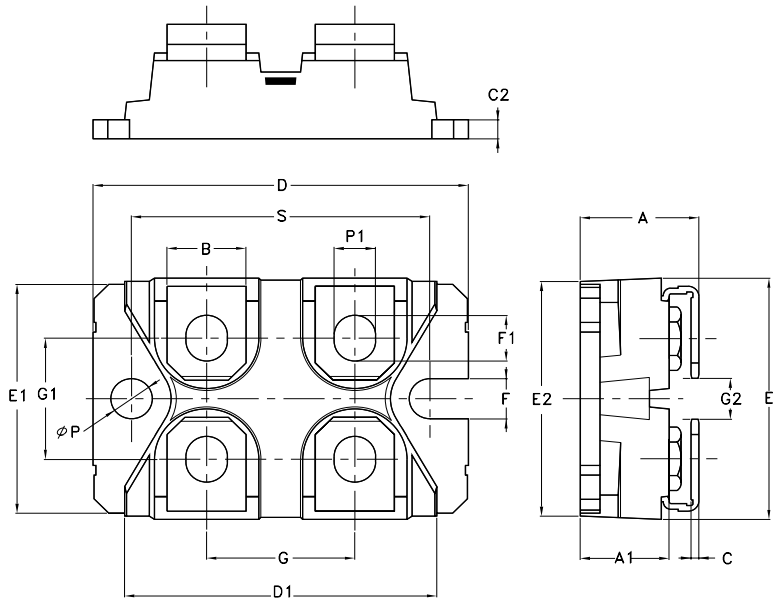
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$I_{CS(SS)}$	Collector-source current (V_{BS} = V_{GS} = 0)	V_{CE} = 1200V			100	µA
$I_{BS(OS)}$	Base-source current (I_C = 0, V_{GS} = 0V)	$V_{BS(OS)}$ = 40V			10	µA
$I_{SB(OS)}$	Source-base current (I_C = 0, V_{GS} = 0)	$V_{SB(OS)}$ = 10V			100	µA
$I_{GS(OS)}$	Gate-source leakage	V_{GS} = ± 20V			500	nA
$V_{CS(ON)}$	Collector-source ON voltage	V_{GS} = 10V I_C = 70A I_B = 14A V_{GS} = 10V I_C = 45A I_B = 4.5A		1 1		V V
h_{FE}	DC current gain	V_{GS} = 10V V_{CS} = 1V I_C = 70A V_{GS} = 10V V_{CS} = 1V I_C = 45A	3 6		7 13	
$V_{BS(ON)}$	Base-emitter ON voltage	V_{GS} = 10V I_C = 70A I_B = 14A V_{GS} = 10V I_C = 45A I_B = 4.5A		tbd tbd		V V
$V_{GS(th)}$	Gate threshold voltage	V_{BS} = V_{GS} I_B = 250µA	3	3.7	4.5	V
C_{iss}	Input Capacitance	V_{CS} = 25V f=1MHz V_{GS} = V_{CB} = 0		tbd		pF
$Q_{GS(tot)}$	Gate-source charge	V_{CS} = 25V V_{GS} = 10 V_{CB} = 0 I_C = 70A		tbd		nC

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

ISOTOP MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	11.8		12.2	0.465		0.480
A1	8.9		9.1	0.350		0.358
B	7.8		8.2	0.307		0.322
C	0.75		0.85	0.029		0.033
C2	1.95		2.05	0.076		0.080
D	37.8		38.2	1.488		1.503
D1	31.5		31.7	1.240		1.248
E	25.15		25.5	0.990		1.003
E1	23.85		24.15	0.938		0.950
E2		24.8			0.976	
G	14.9		15.1	0.586		0.594
G1	12.6		12.8	0.496		0.503
G2	3.5		4.3	0.137		1.169
F	4.1		4.3	0.161		0.169
F1	4.6		5	0.181		0.196
P	4		4.3	0.157		0.169
P1	4		4.4	0.157		0.173
S	30.1		30.3	1.185		1.193



P093A

4 Revision history

Table 4. Document revision history

Date	Revision	Changes
04-May-2007	1	Initial EDOCS release

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