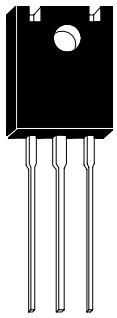
HBD437D

COMPLEMENTARY SILICON POWER TRANSISTORS



TO-126ML

Description

The HBD437D is silison epitaxial-base NPN power transistor in TO-126ML plastic package, intented for use in medium power linear and switching applications. The complementary PNP type is HBD438D.

Absolute Maximum Ratings (T_A=25°C)

Symbol	Parametor		Value	Unit
V_{CBO}	Collector-Base Voltage (I_E=0)		45	V
V_{CES}	Collector-Emitter Voltage (V_{BE}=0)		45	V
V_{CEO}	Collector-Emitter Voltage (I_B=0)		45	V
V_{EBO}	Emitter-Base Voltage (I_C=0)		5	V
I_C	Collector Current		4	A
I_{CM}	Collector Peak Current (t≤10ms)		7	A
I_B	Base Current		1	A
P_D	Total Dissipation at	T_C=25°C	20	W
		T_A=25°C	1.5	W
T_{stg}	Storage Temperature		-55 to 150	°C
T_J	Max. Operating Junction Temperature		150	°C

Thermal Data

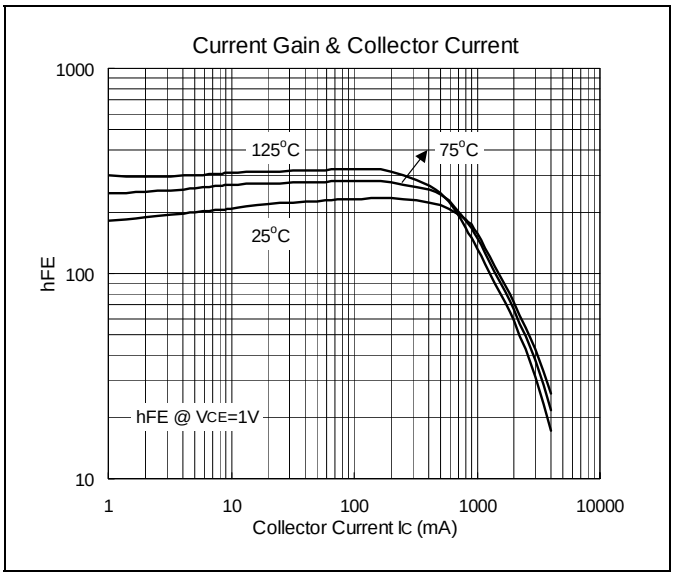
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max.	5	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max.	83	°C/W

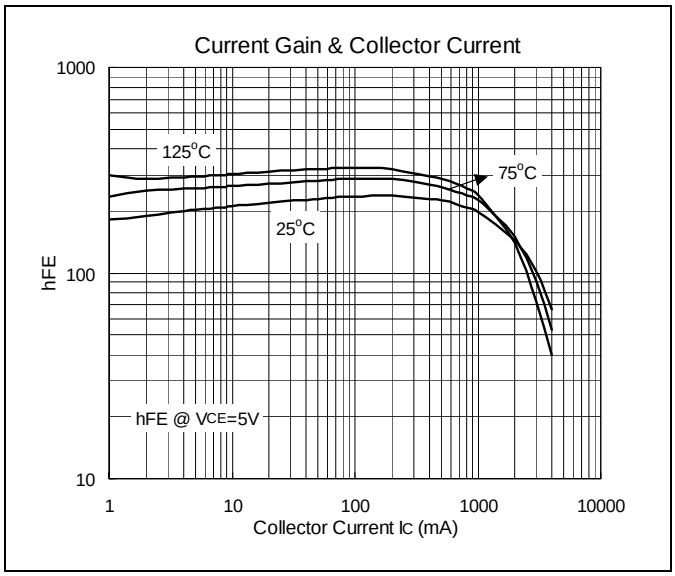
Electrical Characteristics (T_A=25°C, unless otherwise specified)

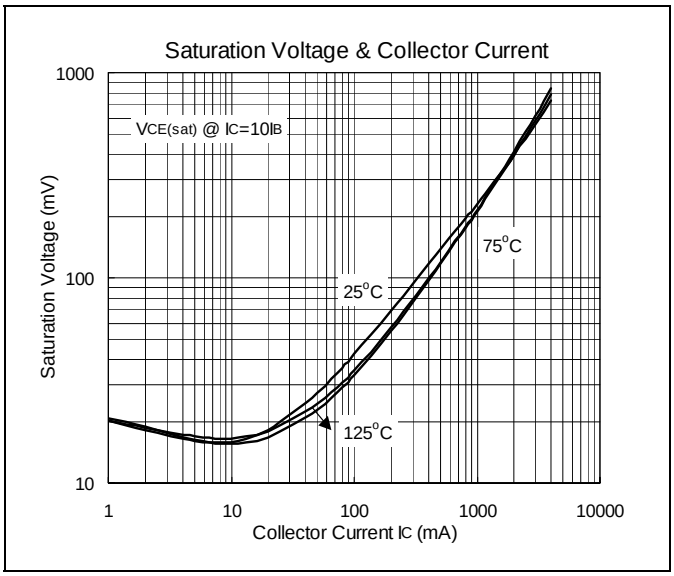
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E=0)	V_{CB}=45V	-	-	100	uA
I_{CES}	Collector Cut-off Current (V_{BE}=0)	V_{CE}=45V	-	-	100	uA
I_{EBO}	Emitter Cut-off Current (I_C=0)	V_{EB}=5V	-	-	1	mA
*$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	I_C=100mA, I_B=0	45	-	-	V
*$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=2A, I_B=0.2A	-	0.4	0.6	V
*V_{BE}	Base-Emitter Voltage	I_C=10mA,V_{CE}=5V	-	0.58	-	V
		I_C=2A, V_{CE}=1V	-	-	1.2	V
*h_{FE}	DC Current Gain	I_C=10mA, V_{CE}=5V	30	130	-	
		I_C=0.5A, V_{CE}=1V	85	140	-	
		I_C=2A, V_{CE}=1V	40	-	-	
*h_{FE1}/h_{FE2}	Matched Pair	I_C=0.5A, V_{CE}=1V	-	-	1.4	
f_T	Transition Frequency	I_C=0.25A, V_{CE}=1V	3	-	-	MHz

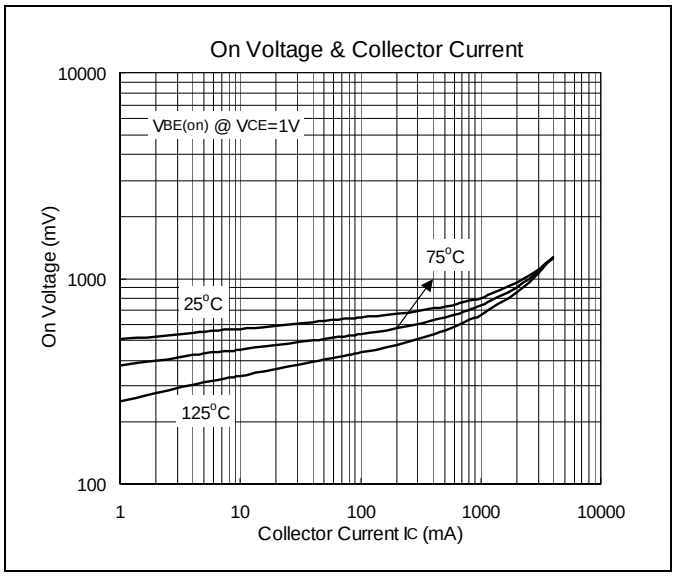
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

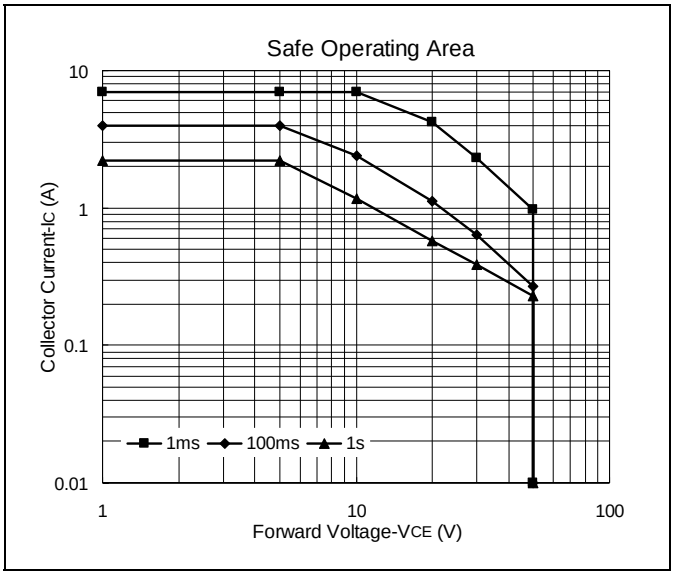
Characteristics Curve



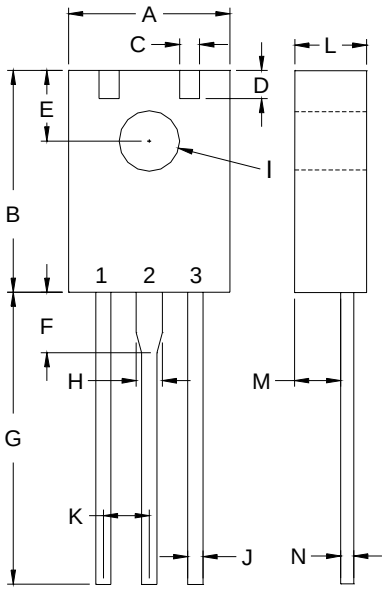




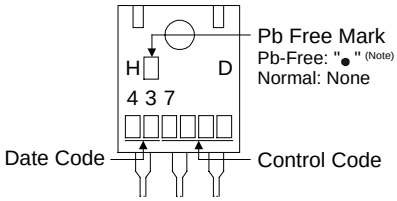




TO-126ML Dimension



Marking:



Note: Green label is used for pb-free packing

Pin Style: 1.Emitter 2.Collector 3.Base

Material:
- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

3-Lead TO-126ML
Plastic Package
HSMC Package Code: D

DIM	Min.	Max.
A	7.74	8.24
B	10.87	11.37
C	0.88	1.12
D	1.28	1.52
E	3.50	3.75
F	2.61	3.37
G	13	-
H	1.18	1.42
I	2.88	3.12
J	0.68	0.84
K	-	2.30
L	3.44	3.70
M	1.88	2.14
N	0.50	0.51

*: Typical, Unit: mm

Head Office And Factory:

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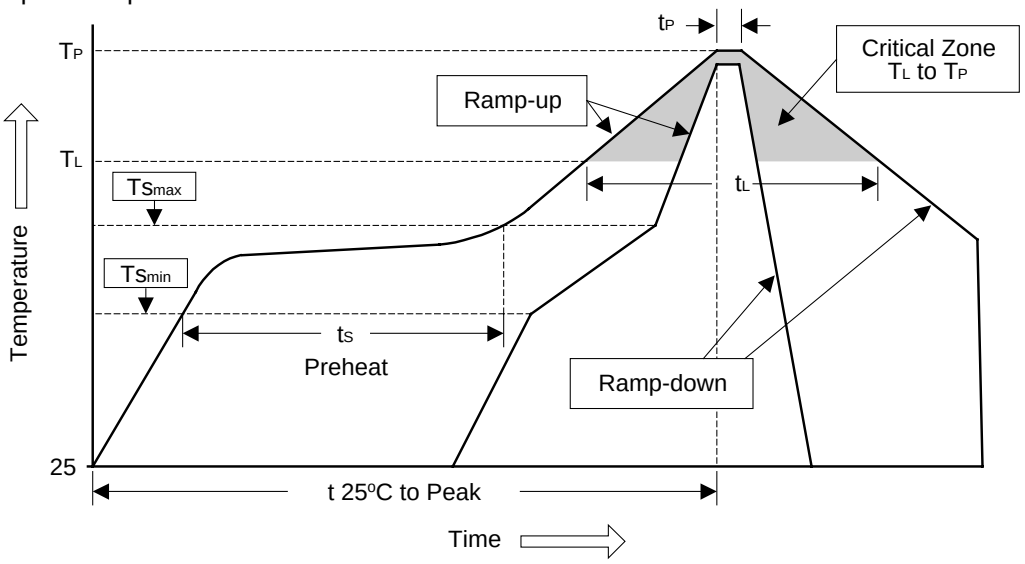
  Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

Soldering Methods for HSMC's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%

2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat - Temperature Min (Ts_{min}) - Temperature Max (Ts_{max}) - Time (min to max) (ts)	 100°C 150°C 60~120 sec	 150°C 200°C 60~180 sec
Tsmax to T_L - Ramp-up Rate	 <3°C/sec	 <3°C/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60~150 sec	 217°C 60~150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10~30 sec	20~40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak temperature	Dipping time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec