

Low Vcesat NPN Epitaxial Planar Transistor

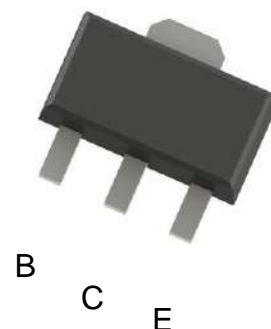
Features

- Low $V_{CE(sat)}$, $V_{CE(sat)}=0.1\text{ V}$ (typical), at $I_C / I_B = 1\text{ A} / 50\text{ mA}$
- Excellent current gain characteristics
- Complementary to KW1424A
- Pb-free lead plating package

BV_{CEO}	50V
I_C	3A
$R_{CE(SAT)}$ typ.	125m Ω

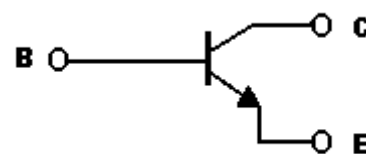
Outline

SOT-89



Symbol

KMD2150A-S



B : Base
 C : Collector
 E : Emitter

Ordering Information

Device	Package	Shipping
KMD2150A-S	SOT-89 (Pb-free lead plating and halogen-free package)	1000 pcs / Tape & Reel

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V _{CBO}	80	V
Collector-Emitter Voltage	V _{CEO}	50	V
Emitter-Base Voltage	V _{EBO}	6	V
Collector Current	I _C	3	A
Collector Current (pulse)	I _{CP}	7	A
Power Dissipation	P _d	0.6	W
		1 *1	
		2 *2	
Operating Junction Temperature Range	T _j	-55~+150	°C
Storage Temperature Range	T _{stg}	-55~+150	°C

Note : *1 Printed circuit board, 1.7mm thick, collector copper plating 10mm*10mm.

*2 When mounted on a 40*40*0.7mm ceramic board.

Characteristics (Ta=25°C)

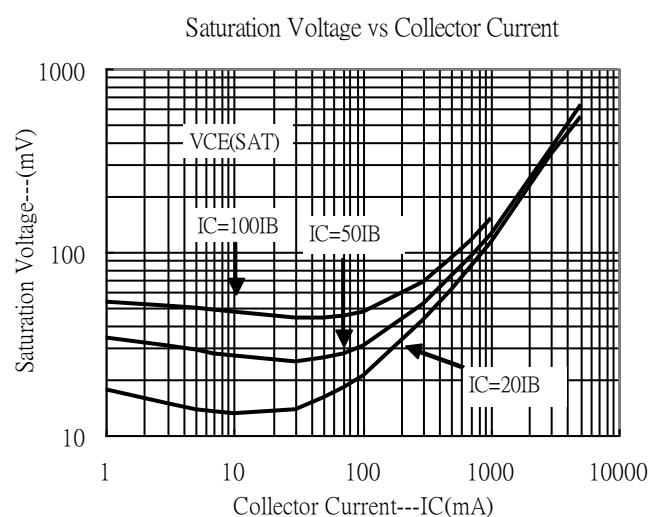
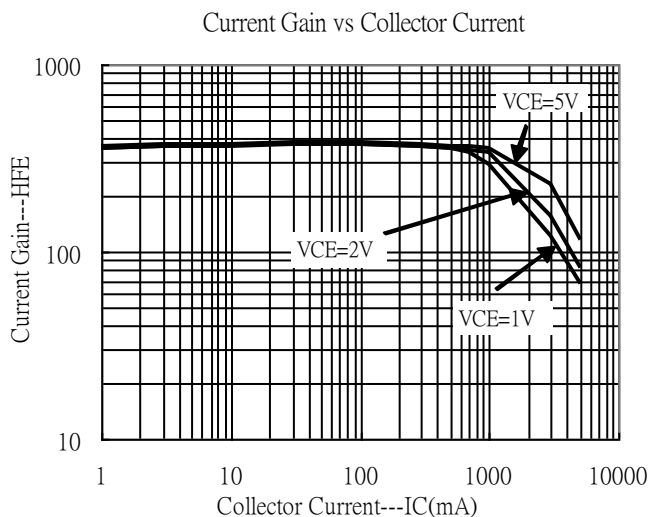
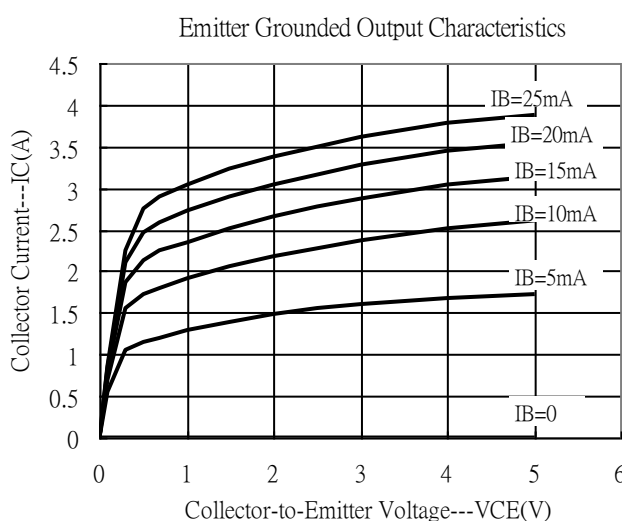
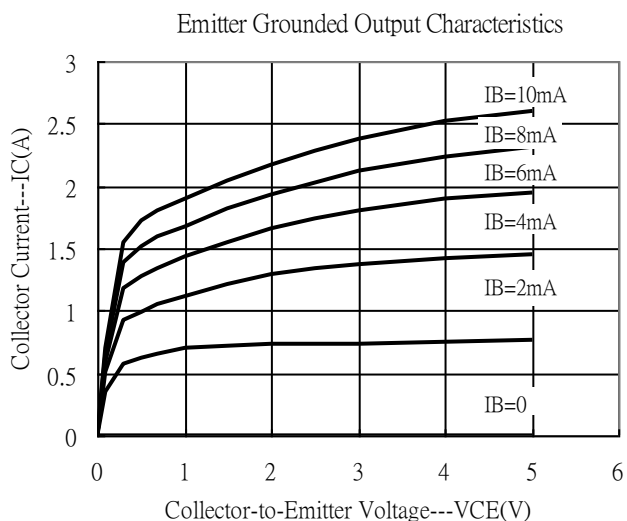
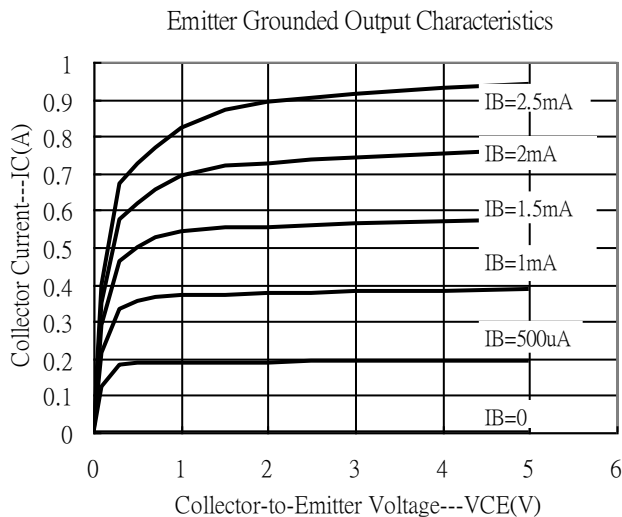
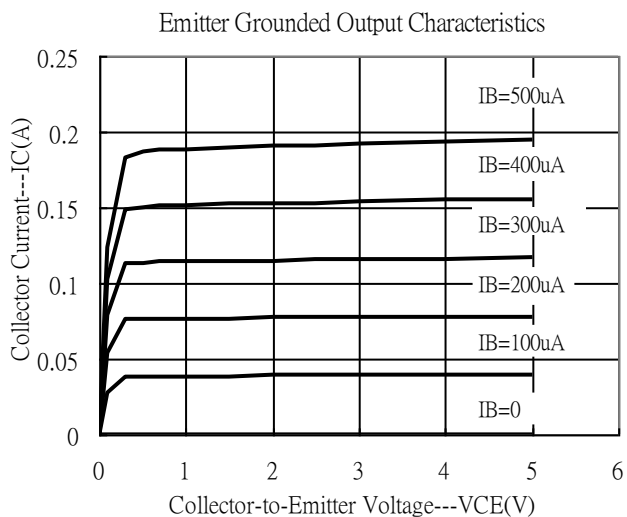
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CBO}	80	-	-	V	I _C =50μA, I _E =0
BV _{CEO}	50	-	-	V	I _C =1mA, I _B =0
BV _{EBO}	6	-	-	V	I _E =50μA, I _C =0
I _{CBO}	-	-	0.1	μA	V _{CB} =60V, I _E =0
I _{EBO}	-	-	0.1	μA	V _{EB} =5V, I _C =0
*V _{CE(sat)}	-	0.1	0.25	V	I _C =1A, I _B =50mA
*V _{CE(sat)}	-	0.25	0.5	V	I _C =2A, I _B =0.2A
*R _{CE(sat)}	-	0.125	0.25	Ω	I _C =2A, I _B =0.2A
*V _{BE(sat)}	0.8	1	1.5	V	I _C =2A, I _B =0.2A
*h _{FE 1}	270	-	-	-	V _{CE} =2V, I _C =0.1A
*h _{FE 2}	270	-	560	-	V _{CE} =2V, I _C =0.5A
*h _{FE 3}	100	-	-	-	V _{CE} =2V, I _C =1A
f _T	-	90	-	MHz	V _{CE} =5V, I _C =0.1A, f =100MHz
C _{ob}	-	14	-	pF	V _{CB} =10V, f=1MHz

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

Classification Of h_{FE 2}

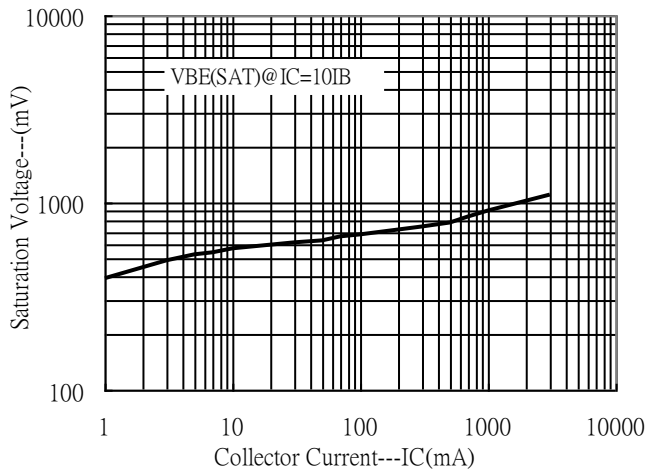
Rank	S
Range	270~560

Typical Characteristics

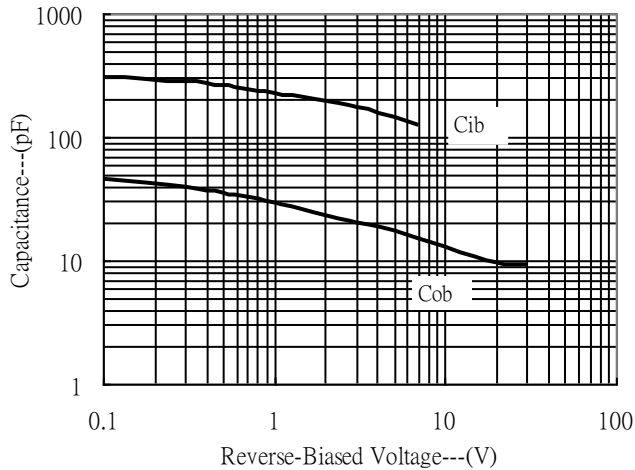


Typical Characteristics(Cont.)

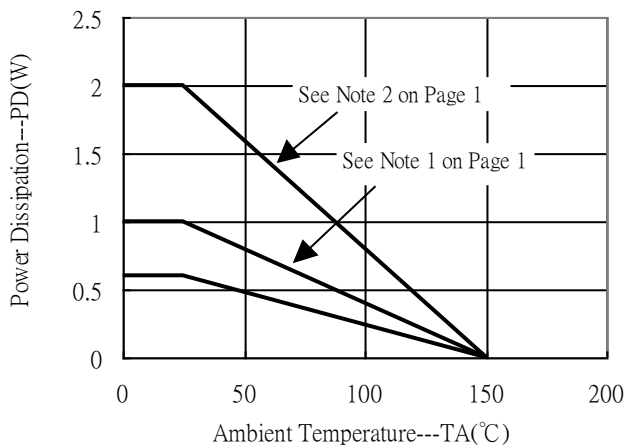
Saturation Voltage vs Collector Current



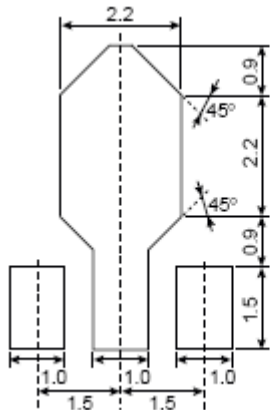
Capacitance vs Reverse-Biased Voltage



Power Derating Curves



Recommended soldering footprint

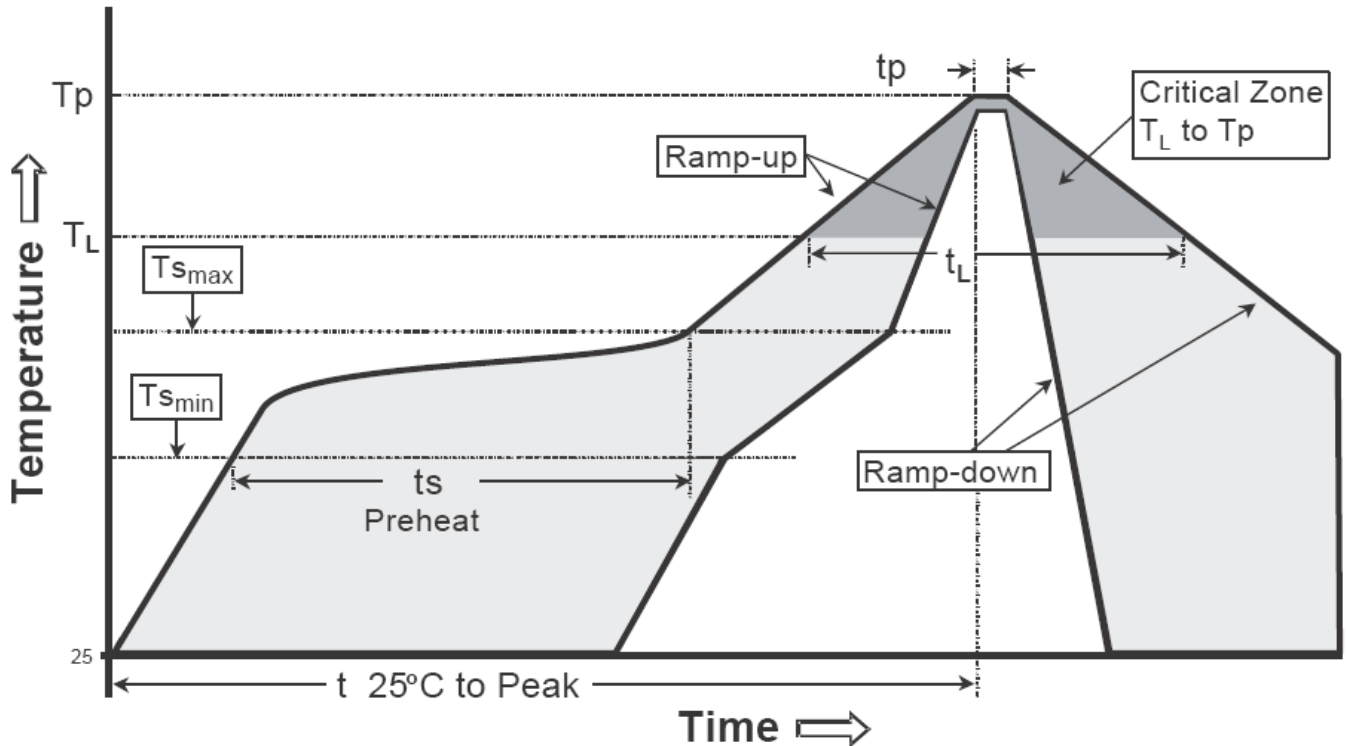


unit : mm

Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

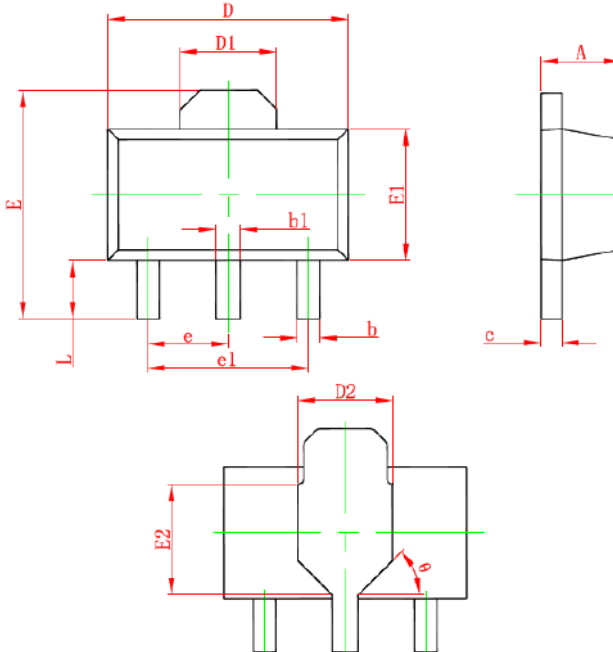
Recommended temperature profile for IR reflow



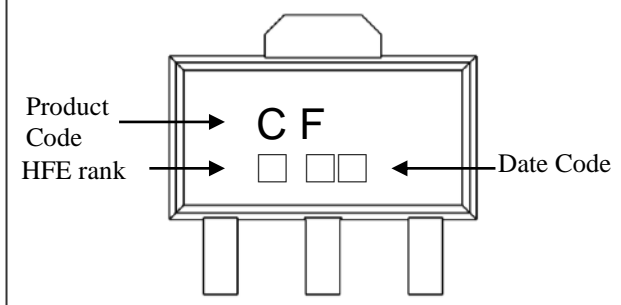
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (Tl)	183°C	217°C
- Time (tl)	60-150 seconds	60-150 seconds
Peak Temperature(Tp)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

SOT-89 Dimension



Marking:



Product Code → **CF**

HFE rank → □ □ □ ← Date Code

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

Date Code: Year+Month
 Year: 3→2003, 4→2004
 Month: 1→1, 2→2, . . .
 9→9, A→10, B→11, C→12

3-Lead SOT-89 Plastic Surface Mounted Package

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.055	0.063	1.40	1.60	E	0.155	0.167	3.94	4.25
b	0.013	0.020	0.32	0.52	E1	0.091	0.102	2.30	2.60
b1	0.016	0.023	0.40	0.58	E2	0.075 REF.		1.90 REF.	
c	0.014	0.017	0.35	0.44	e	0.060 TYP.		1.50 TYP.	
D	0.173	0.181	4.40	4.60	e1	0.118 TYP.		3.00 TYP.	
D1	0.061 REF.		1.55 REF.		L	0.035	0.047	0.90	1.20
D2	0.069 REF.		1.75 REF.		θ	45°		45°	

Notes: 1. Controlling dimension: millimeters.
 2. Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.