HA1127/P/FP

5 Transistor Arrays

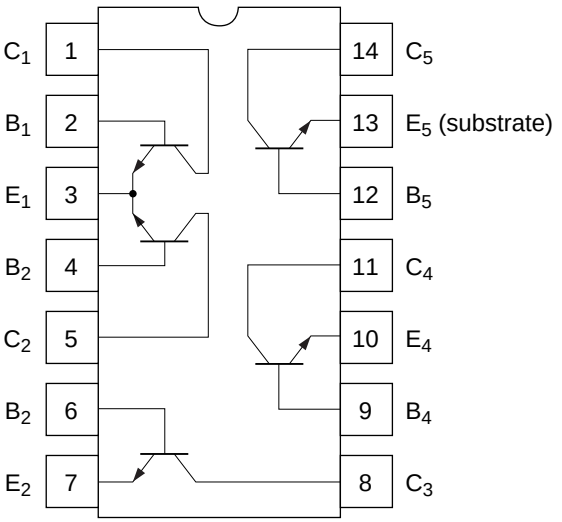
HITACHI

ADE-204-062 (Z)
Rev. 0
Dec. 2000

Ordering Information

Application	Type No.	Package
Commercial use	HA1127	DP-14
Industrial use	HA1127P	DP-14
	HA1127FP	FP-14DA

Pin Arrangement



(Top view)

Note: Use pin 13 as the lowest potential for this IC.

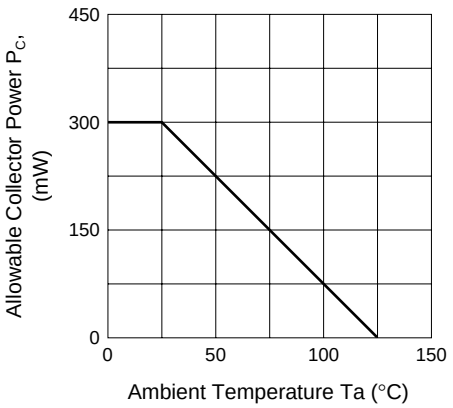
Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	20	V
Collector-substrate voltage	V_{CIO}	20	V
Collector-emitter voltage	V_{CEO}	15	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	50	mA
Collector power dissipation	P_C*[1]	300	mW
Collector power dissipation	P_C	750*[2]	mW
		625*[3]	
Operating temperature	Topr	–55 to +125	°C
Storage temperature	Tstg	–55 to +125	°C

Notes: 1. Allowable value per individual transistor. This is the allowable value up to Ta = 25°C. Derate at 3 mW/°C above that temperature.
2. Allowable value for the whole package. (HA1127/P)
This is the allowable value up to Ta = 35°C for the HA1127P. Derate at 8.3 mW/°C above that temperature.
3. Allowable value for the whole package. (HA1127FP)
See notes on SOP Package Usage in Reliability section.

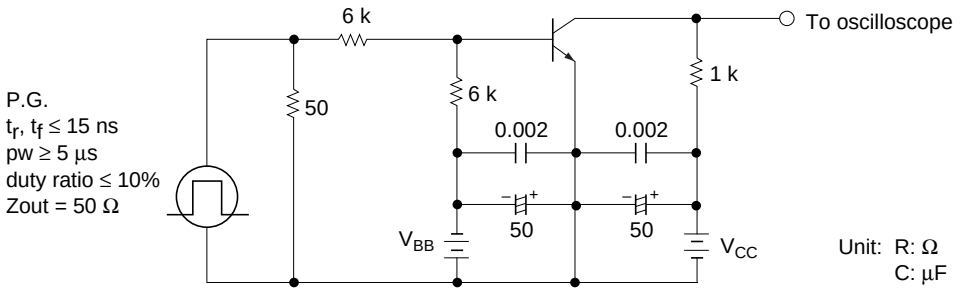
Allowable Collector Power Ambient Temperature Variation



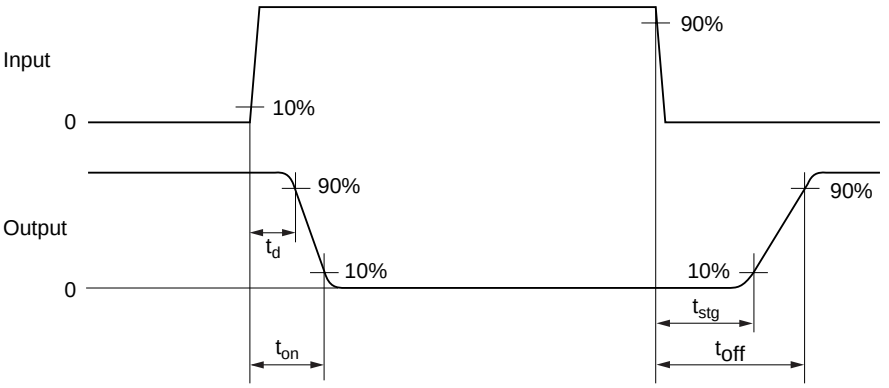
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Condition	
Collector-base breakdown voltage	$V_{(BR)CBO}$	20	—	—	V	I_C = 10 μA, I_E = 0	
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	15	—	—	V	I_C = 1 mA, R_{BE} = ∞	
Collector-substrate breakdown voltage	$V_{(BR)ClO}$	20	—	—	V	I_C = 10 μA, I_E = 0, IB = 0	
Emitter-base breakdown voltage	$V_{(BR)EBO}$	5	—	—	V	I_E = 10 μA, I_C = 0	
Collector cutoff current	I_{CBO}	—	0.002	40	nA	V_{CB} = 10 V, I_E = 0	
	I_{CEO}	—	—	0.5	μA	V_{CE} = 10 V, R_{BE} = ∞	
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	0.17	—	V	I_C = 10 mA, I_B = 1 mA	
Base-emitter voltage	V_{BE}	—	0.72	—	V	V_{CE} = 3 V	I_C = 1 mA
		—	0.80	—	V		I_C = 10 mA
DC current amplification ratio	h_{FE}	40	140	—		V_{EE} = 3 V	I_C = 1 mA
		—	120	—			I_C = 10 mA
Gain-bandwidth product	f_T	—	460	—	MHz	V_{CE} = 3 V, I_C = 3 mA	
Collector output capacitance	Cob	—	1.7	—	pF	V_{CB} = 3 V, I_E = 0, f = 1 MHz	
Emitter input capacitance	Cib	—	2.0	—	pF	V_{CB} = 3 V, I_E = 0, f = 1 MHz	
Switching time	t_{on}	—	35	—	ns	V_{CC} = 10 V, I_C = $10I_{B1}$ = $–10I_{B2}$ = 10 mA	
	t_{off}	—	130	—	ns		
	t_{stg}	—	75	—	ns		

Switching Time Test Circuit



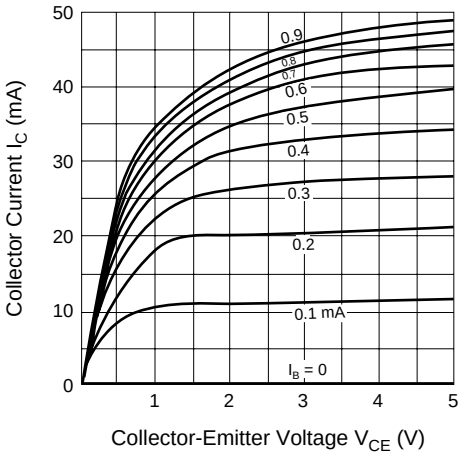
Response Waveform



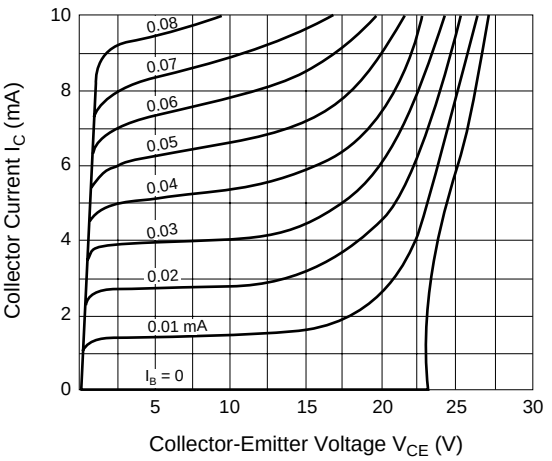
Operating Conditions

Symbol	I_C	I_{B1}	I_{B2}	V_{CC}	V_{BB}	V_{IN}
Unit	mA	mA	mA	V	V	V
Bias	10	+1.0	–1.0	10.3	–6.0	+13.0

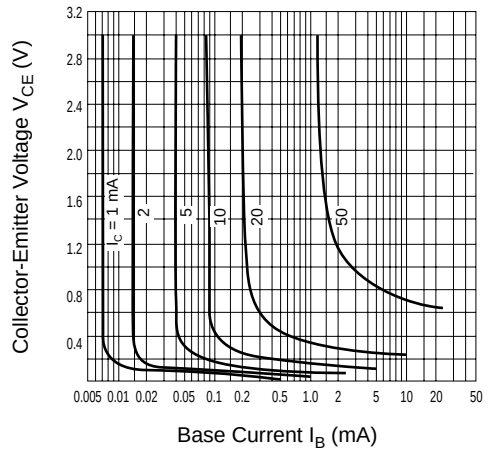
Emitter-Ground Output Static Characteristics (1)



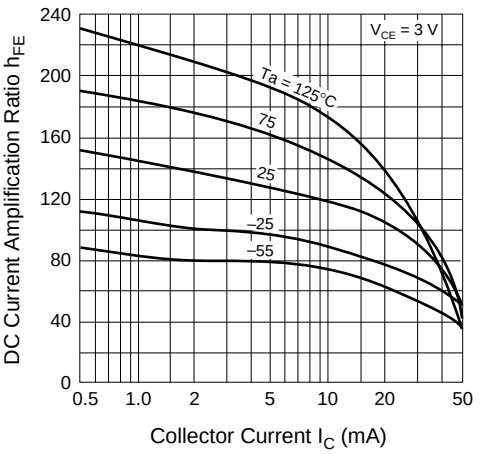
Emitter-Ground Output Static Characteristics (2)



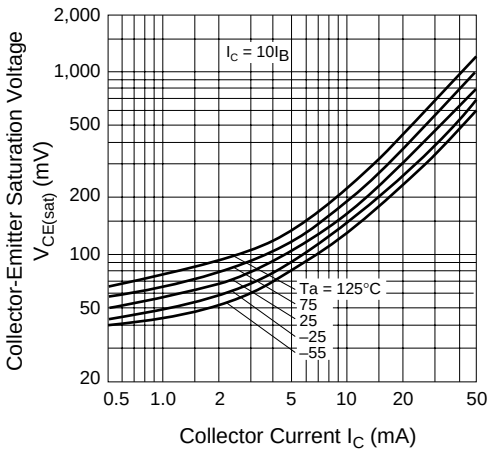
Collector-Emitter Voltage vs. Base Current Characteristics



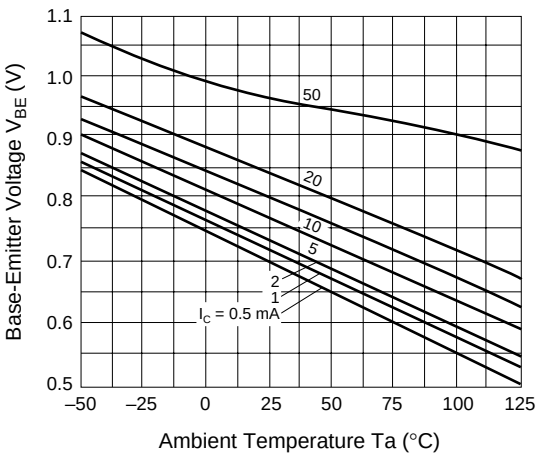
DC Current Amplification Ratio vs. Collector Current Characteristics



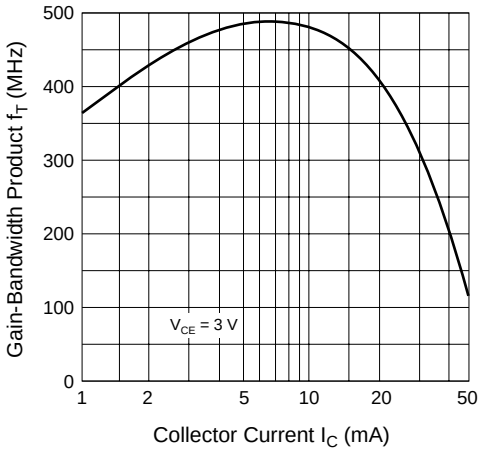
Collector-Emitter Saturation Voltage vs. Collector Current Characteristics



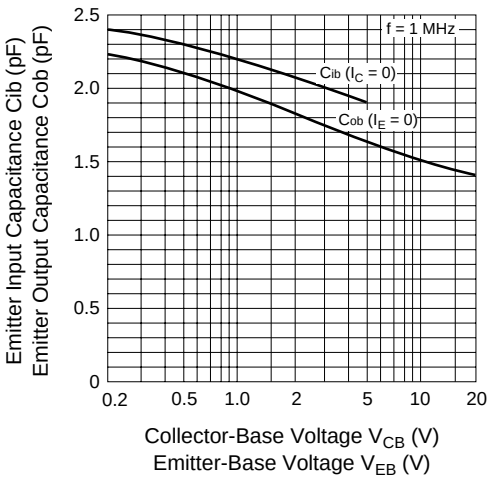
Base-Emitter Voltage vs. Ambient Temperature Characteristics



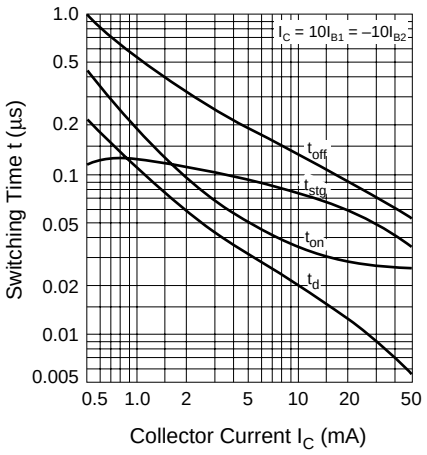
Gain-Bandwidth Product vs. Collector Current Characteristics



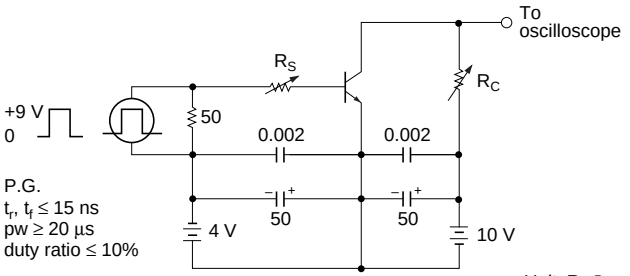
Input and Output Capacitances vs. Voltage Characteristics



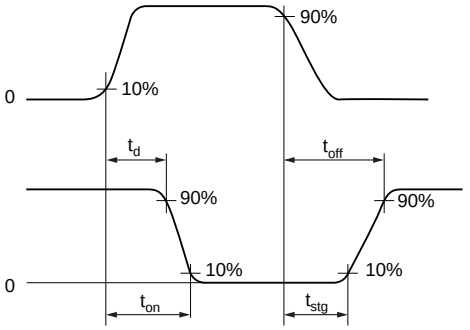
Switching Time vs. Collector Current Characteristics



Switching Time Test Circuit

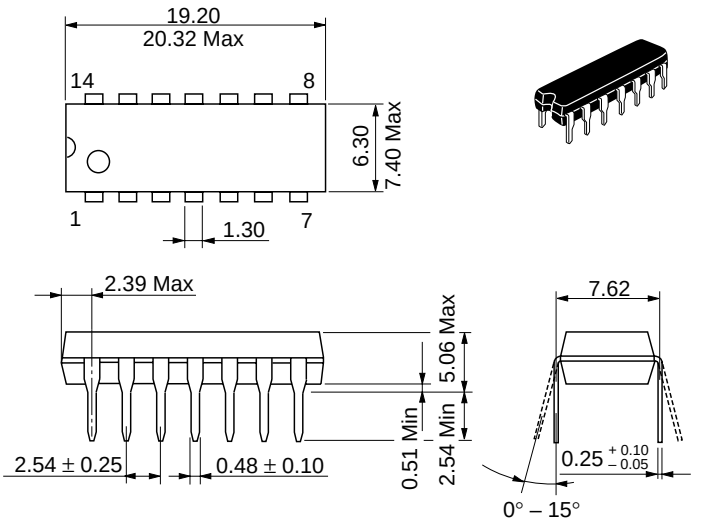


Response Waveform



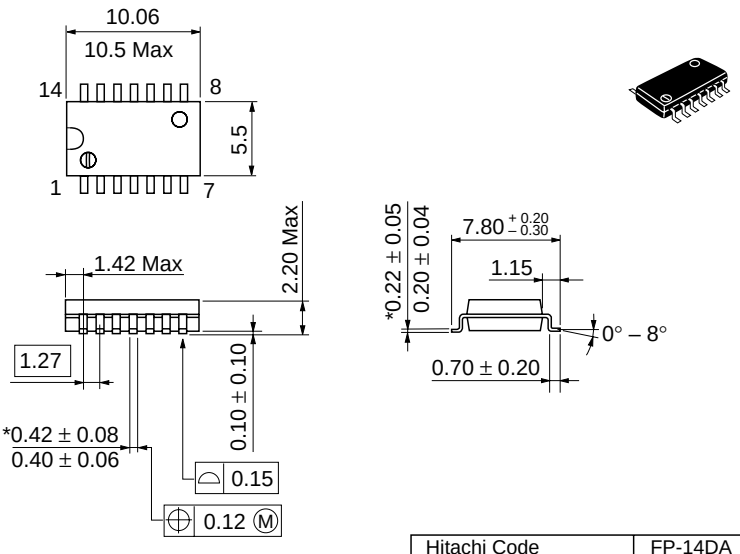
Package Dimensions

Unit: mm



Hitachi Code	DP-14
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.97 g

Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-14DA
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.23 g

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