

SMALL-SIGNAL COMPLEMENTARY PRE-BIASED DUAL TRANSISTOR

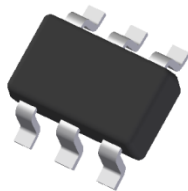
Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- Surface-Mount Package Suited for Automated Assembly
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ACX124EUQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

R ₁ (Nom)	R ₂ (Nom)
22kΩ	22kΩ

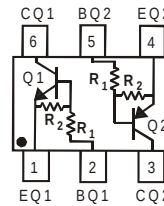
SOT363



Top View

Mechanical Data

- Package: SOT363
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 
- Weight: 0.006 grams (Approximate)



Device Schematic

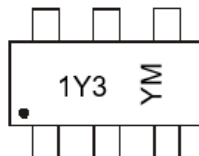
Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
ACX124EUQ-7R	SOT363	1Y3	7	8	3,000	Reel
ACX124EUQ-13R	SOT363	1Y3	13	8	10,000	Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

SOT363



1Y3 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: M = 2025)
M = Month (ex: 9 = September)

Date Code Key

Year	2016	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	D	-	M	N	P	R	S	T	U	V	W	X
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Absolute Maximum Ratings - NPN Section (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Supply Voltage <Pin: (6) to (1)>	V _{CC}	50	V
Input Voltage <Pin: (2) to (1)>	V _{IN}	-10 to +40	V
Output Current	I _O	30	mA
Output Current	I _C (Max)	100	mA

Absolute Maximum Ratings - PNP Section (@T_A = +25°C, unless otherwise specified.)

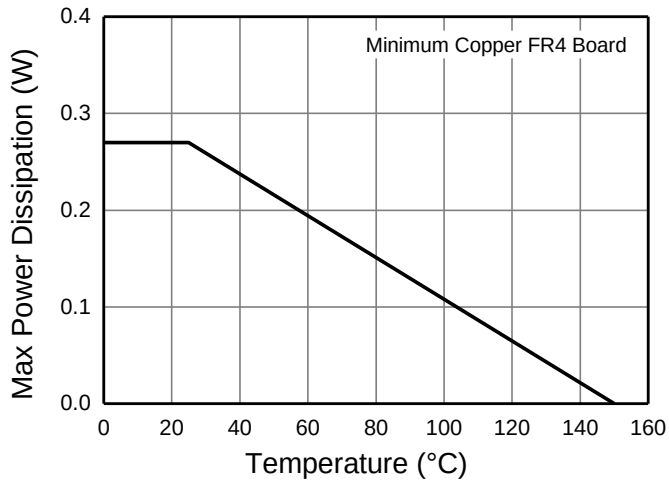
Characteristic	Symbol	Value	Unit
Supply Voltage <Pin: (4) to (3)>	V _{CC}	50	V
Input Voltage <Pin: (5) to (4)>	V _{IN}	+10 to -40	V
Output Current	I _O	-30	mA
Output Current	I _C (Max)	-100	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

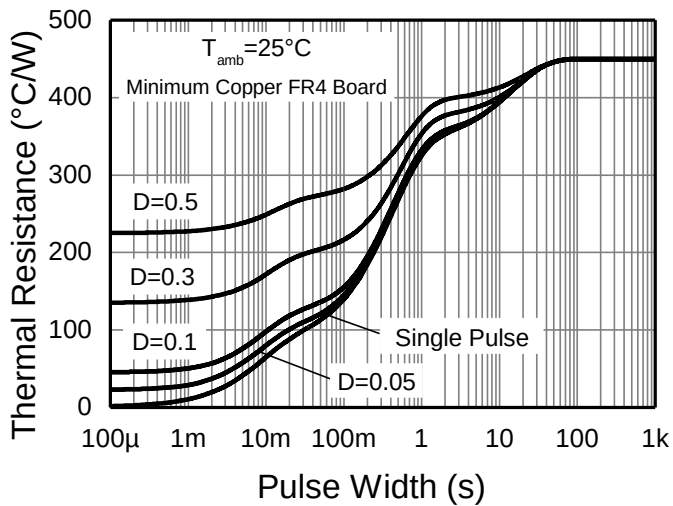
Characteristic	Symbol	Value	Unit
Power Dissipation (Notes 5 & 6)	P _D	270	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R _{θJA}	450	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Notes: 5. Mounted on FR4 PC Board with minimum recommended pad layout.
6. 150mW per element must not be exceeded.

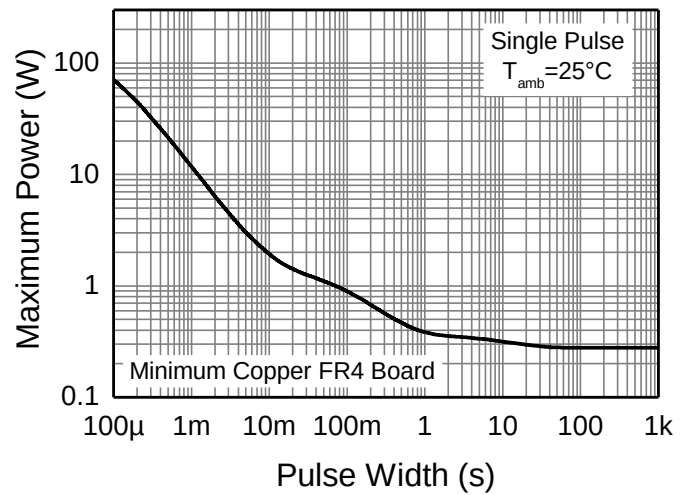
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

Electrical Characteristics - NPN Section (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	V _{I(off)} (Note 7)	0.5	1.1	—	V	V _{CC} = 5V, I _O = 100μA
	V _{I(on)} (Note 8)	—	1.9	3.0		V _O = 0.3V, I _O = 5mA
Output Voltage	V _{O(on)}	—	0.1	0.3	V	I _O /I _I = 10mA/0.5mA
Input Current	I _I	—	—	0.36	mA	V _I = 5V
Output Current	I _{O(off)}	—	—	0.5	μA	V _{CC} = 50V, V _I = 0V
DC Current Gain	G _I	60	—	—	—	V _O = 5V, I _O = 5mA
Input Resistor (R ₁) Tolerance	ΔR ₁	-30	—	+30	%	—
Resistance Ratio Tolerance	ΔR ₂ /R ₁	-20	—	+20	%	—
Gain-Bandwidth Product (Note 9)	f _T	—	250	—	MHz	V _{CE} = 10V, I _E = 5mA, f = 100MHz

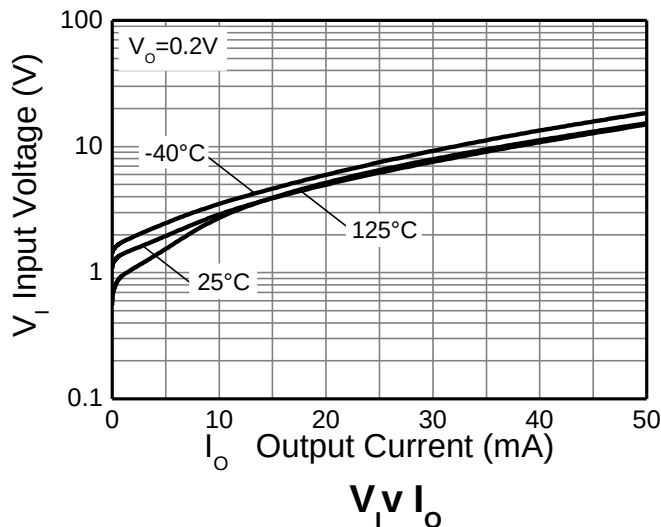
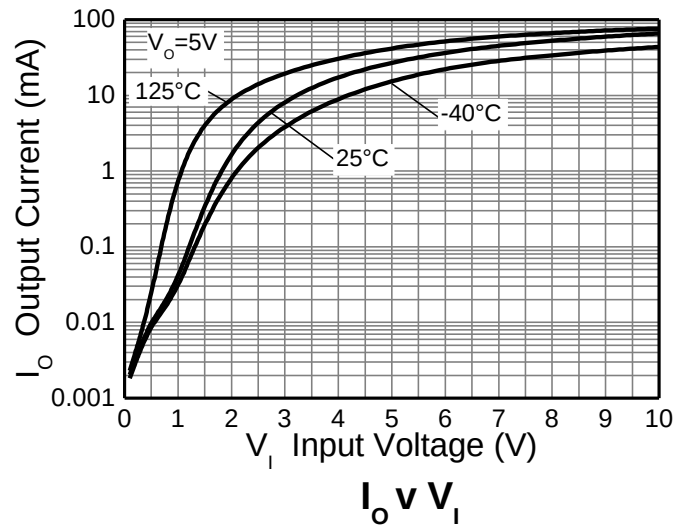
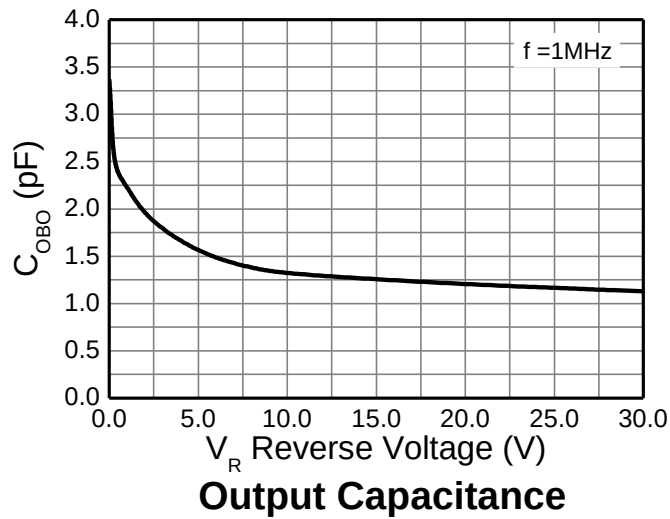
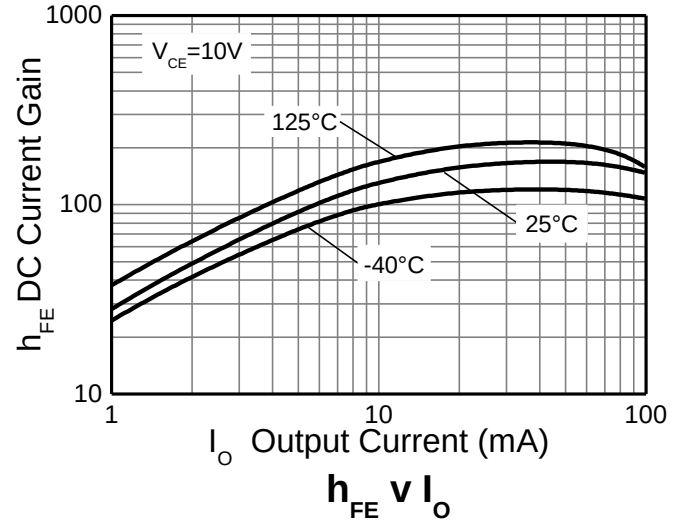
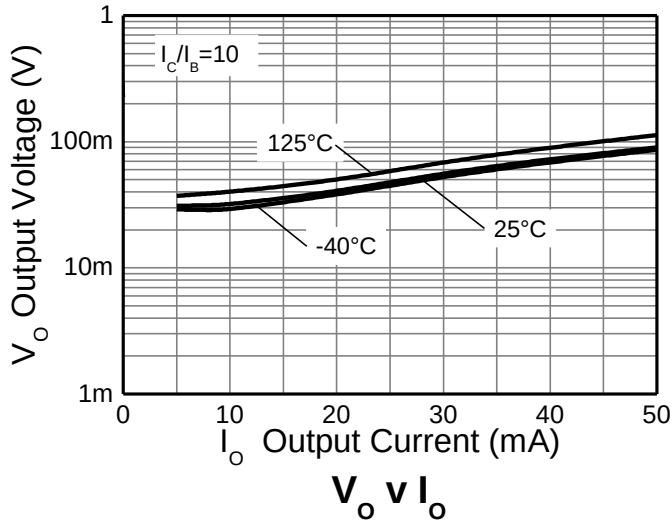
Notes: 7. Guarantees that the device will be switched OFF if the Input Voltage is less than 0.5V.
8. Guarantees that the device will be switched ON if the Input Voltage is more than 3V.
9. Transistor - For Reference Only.

Electrical Characteristics - PNP Section (@T_A = +25°C, unless otherwise specified.)

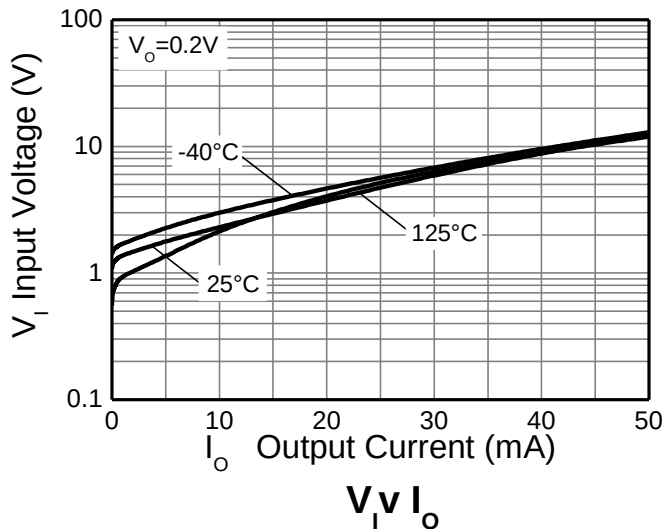
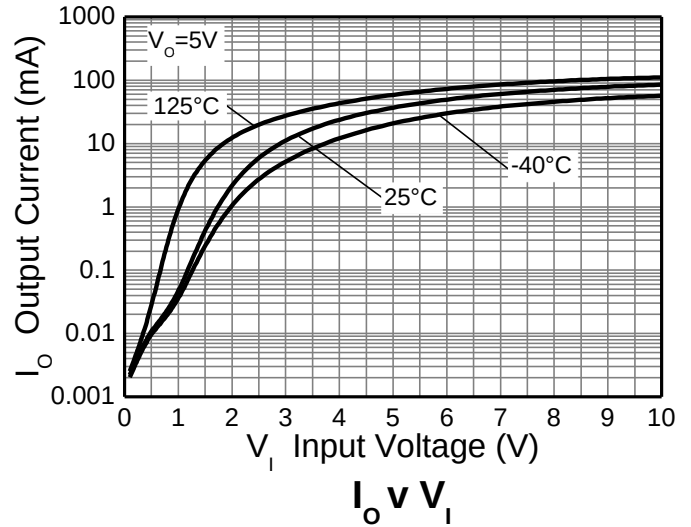
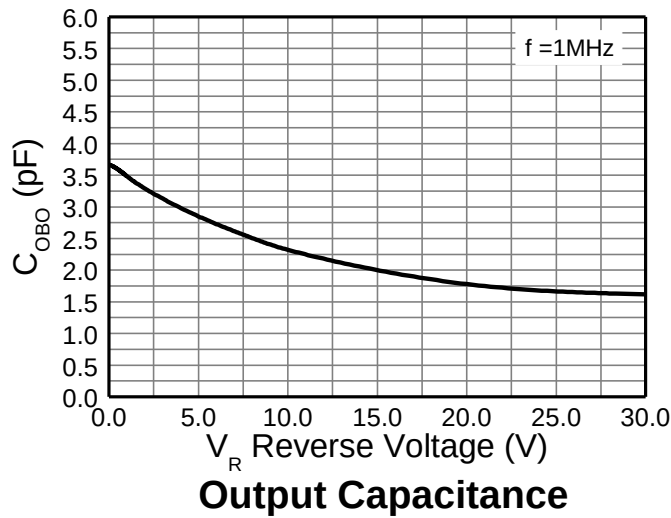
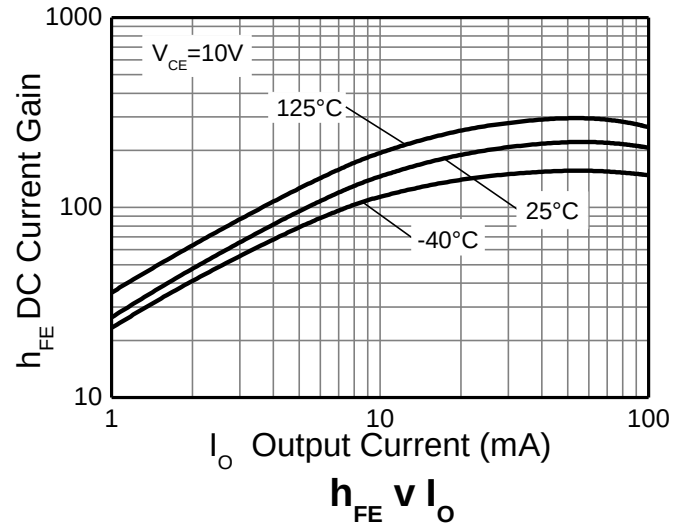
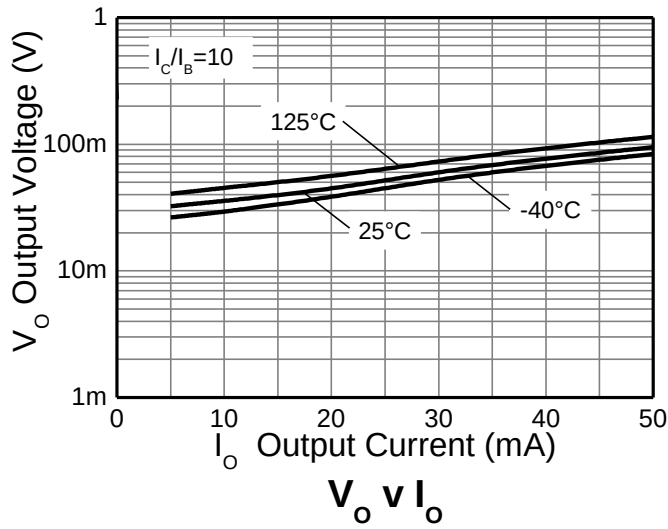
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	V _{I(off)} (Note 10)	-0.5	-1.1	—	V	V _{CC} = -5V, I _O = -100μA
	V _{I(on)} (Note 11)	—	-1.9	-3.0		V _O = -0.3V, I _O = -5mA
Output Voltage	V _{O(on)}	—	-0.1	-0.3	V	I _O /I _I = -10mA/-0.5mA
Input Current	I _I	—	—	-0.36	mA	V _I = -5V
Output Current	I _{O(off)}	—	—	-0.5	μA	V _{CC} = 50V, V _I = 0V
DC Current Gain	G _I	60	—	—	—	V _O = -5V, I _O = -5mA
Input Resistor (R ₁) Tolerance	ΔR ₁	-30	—	+30	%	—
Resistance Ratio Tolerance	ΔR ₂ /R ₁	-20	—	+20	%	—
Gain-Bandwidth Product (Note 9)	f _T	—	250	—	MHz	V _{CE} = -10V, I _E = -5mA, f = 100MHz

Notes: 9. Transistor - For Reference Only.
10. Guarantees that the device will be switched OFF if the Input Voltage is less than -0.5V.
11. Guarantees that the device will be switched ON if the Input Voltage is more than -3V.

Typical Electrical Characteristics – NPN Section (@T_A = +25°C, unless otherwise specified.)



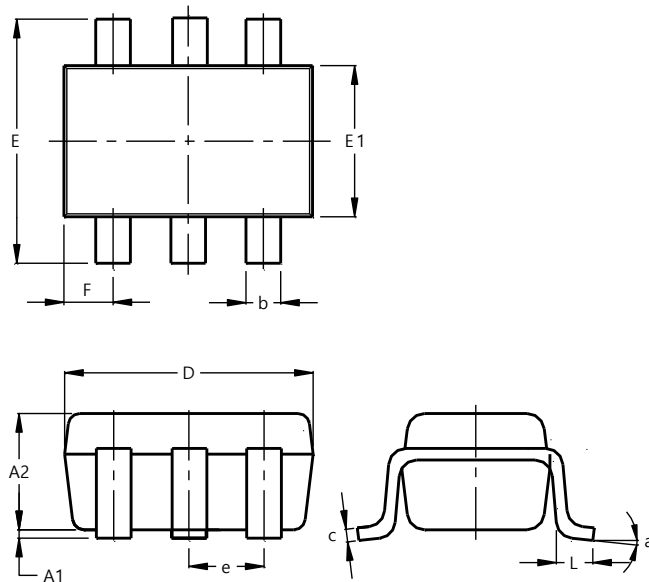
Typical Electrical Characteristics – PNP Section (@T_A = +25°C, unless otherwise specified.)



Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT363

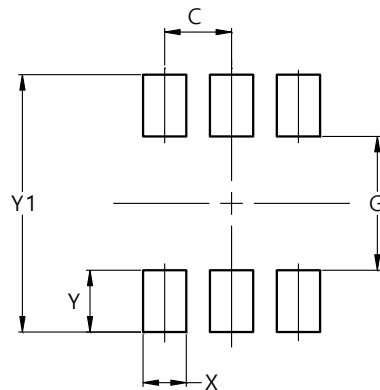


SOT363			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT363



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500

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