



## DC0150ADJ / DC0150BDJ

#### COMPLEMENTARY NPN/PNP SURFACE MOUNT TRANSISTOR

### **Features**

- Epitaxial Planar Die Construction
- Ideally Suited for Automated Assembly Processes
- Lead Free By Design/RoHS Compliant (Note 1)
- "Green" Device (Note 2)
- Ultra Small Package

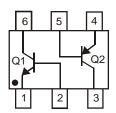
## **Mechanical Data**

- Case: SOT-963
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish Matte Tin annealed over Copper leadframe.
  Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 5
- Ordering Information: See Page 5
- Weight: 0.0027 grams (approximate)

SOT-963



Top View



**Device Schematic** 

## **Maximum Ratings—Q1 NPN** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	60	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Collector Current – Continuous	Ic	100	mA
Base Current	I <sub>B</sub>	30	mA

### Maximum Ratings-Q2 PNP @TA = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-50	V
Collector-Emitter Voltage	$V_{CEO}$	-50	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current - Continuous	Ic	-100	mA
Base Current	I <sub>B</sub>	-30	mA

### **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	P <sub>D</sub>	300	mW
Thermal Resistance, Junction to Ambient (Note 3)	$R_{ hetaJA}$	417	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Notes:

- 1. No purposefully added lead.
- 2. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead\_free/index.php.
- 3. Device mounted on FR-4 PCB with minimum recommended pad layout.



# Electrical Characteristics—Q1 NPN @TA = 25°C unless otherwise specified

Characteris	tic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)							
Collector-Base Breakdown Voltage		V( <sub>BR)CBO</sub>	60		_	V	$I_C = 10 \mu A, I_E = 0$
Collector-Emitter Breakdown Voltag	ge	V(BR)CEO	50		_	V	$I_C = 1 \text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage		V( <sub>BR)EBO</sub>	5		_	V	$I_E = 10 \mu A, I_C = 0$
Collector Cut-Off Current		I <sub>CBO</sub>			0.1	μΑ	$V_{CB} = 60V, I_{E} = 0$
Emitter Cut-Off Current		I <sub>EBO</sub>	_	_	0.1	μΑ	$V_{EB} = 5V, I_{C} = 0$
ON CHARACTERISTICS (Note 4)							
Collector-Emitter Saturation Voltage	е	V <sub>CE(SAT)</sub>	_	0.10	0.25	V	I <sub>C</sub> = 100mA, I <sub>B</sub> = 10mA
DC Current Gain	DC0150ADJ	h <sub>FE</sub>	120	_	240	_	$V_{CF} = 6V, I_{C} = 2mA$
	DC0150BDJ	'''	200		400		VGE - 0 V, 1C - 2111/
SMALL SIGNAL CHARACTERISTICS							
Transition Frequency		f⊤	60	_	_	MHz	$V_{CE} = 10V$ , $I_E = -1mA$ f = 30MHz
Output Capactiance		C <sub>ob</sub>		1.3	_	pF	$V_{CB} = 10V, I_E = 0,$ f = 1MHz

# Electrical Characteristics—Q2 PNP @TA = 25°C unless otherwise specified

Characteristic		Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)							
Collector-Base Breakdown Voltage		V(BR)CBO	-50	_	_	V	$I_C = -10\mu A, I_E = 0$
Collector-Emitter Breakdown Voltage	)	V(BR)CEO	-50	_	_	V	$I_C = -1 \text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage		V(BR)EBO	<del>-</del> 5	_	_	V	$I_E = -10\mu A, I_C = 0$
Collector Cut-Off Current		I <sub>CBO</sub>		_	-0.1	μΑ	$V_{CB} = -50V, I_{E} = 0$
Emitter Cut-Off Current		I <sub>EBO</sub>	_	_	-0.1	μΑ	$V_{EB} = -5V, I_{C} = 0$
ON CHARACTERISTICS (Note 4)							
Collector-Emitter Saturation Voltage		V <sub>CE(SAT)</sub>	_	-0.15	-0.3	V	$I_C = -100 \text{mA}, I_B = -10 \text{mA}$
DC Current Gain	DC0150ADJ	h	120	_	240		VcF = -6V, Ic = -2mA
	DC0150BDJ	hFE	200	_	400	_	VCE = -0 V, IC = -2111A
SMALL SIGNAL CHARACTERISTICS							
Transition Frequency		f <sub>T</sub>	80	_		MHz	$V_{CE} = -10V$ , $I_E = 1mA$ f = 30MHz
Output Capactiance		C <sub>ob</sub>		1.6	_	pF	$V_{CB} = -10V, I_{E} = 0,$ f = 1MHz

Notes: 4. Measured under pulsed conditions. Pulse width =  $300\mu$ s. Duty cycle  $\leq 2\%$ 

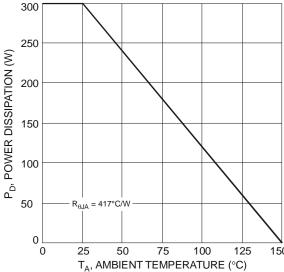
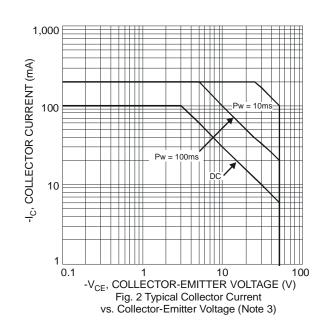
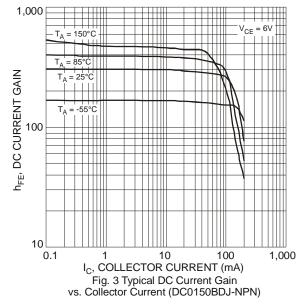
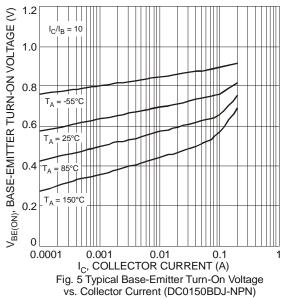


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)



## DC0150ADJ / DC0150BDJ





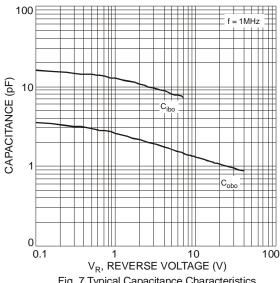


Fig. 7 Typical Capacitance Characteristics (DC0150BDJ - NPN)

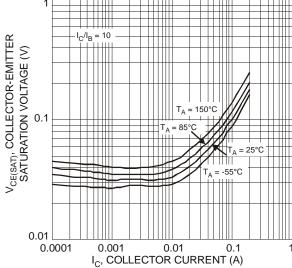


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current (DC0150BDJ-NPN)

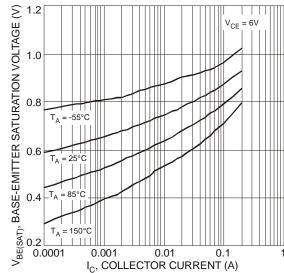


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current (DC0150BDJ - NPN)

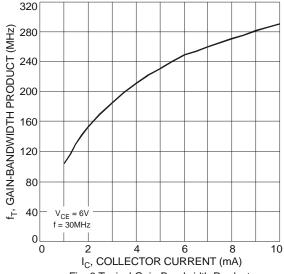
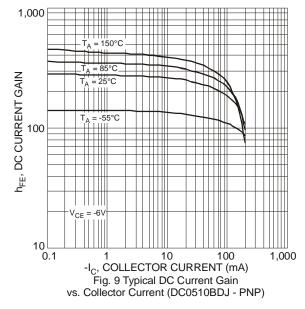
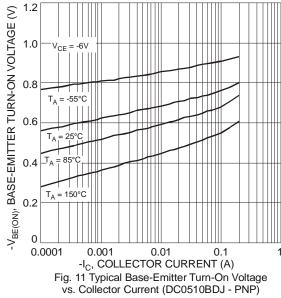


Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current (DC0150BDJ - NPN)



## DC0150ADJ / DC0150BDJ





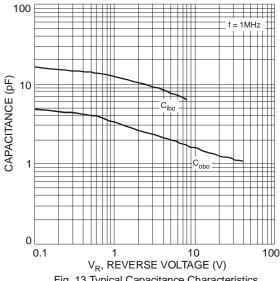


Fig. 13 Typical Capacitance Characteristics (DC0150BDJ - PNP)

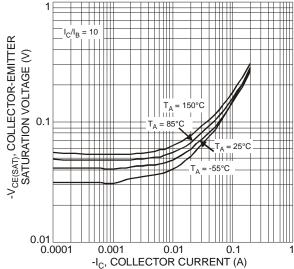


Fig. 10 Typical Collector-Emitter Saturation Voltage vs. Collector Current (DC0510BDJ - PNP)

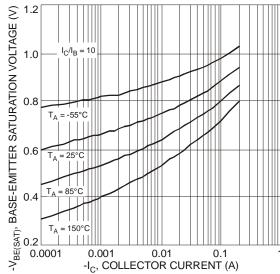


Fig. 12 Typical Base-Emitter Saturation Voltage vs. Collector Current (DC0150BDJ - PNP)

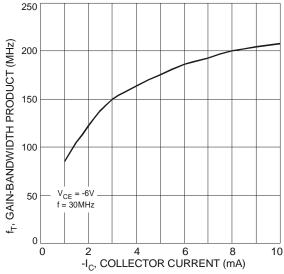


Fig. 14 Typical Gain-Bandwidth Product vs. Collector Current (DC0510BDJ - PNP)

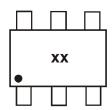


# Ordering Information (Note 5)

Device	Packaging	Shipping
DC0150ADJ-7	SOT-963	10,000/Tape & Reel
DC0150BDJ-7	SOT-963	10,000/Tape & Reel

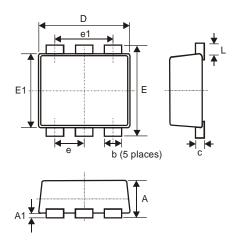
Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

## **Marking Information**



xx= Product Type Marking Code: T1 = DC0150ADJ T2 = DC0150BDJ

# **Package Outline Dimensions**



SOT-963						
Dim	Min	Max	Тур			
Α	0.40	0.50	0.45			
A1	0	0.05	1			
C	0.077	0.177	0.127			
D	0.95	1.05	1.00			
Е	0.95	1.05	1.00			
E1	0.75	0.85	0.80			
L	0.05 0.15 0.10					
b	0.10	0.20	0.15			
e	0.35 Typ					
e1	0.70 Typ					
All Dimensions in mm						



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