Lead-free Green

DC0150ADJ / DC0150BDJ

COMPLEMENTARY NPN/PNP SURFACE MOUNT TRANSISTOR

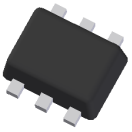
Features

- 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**

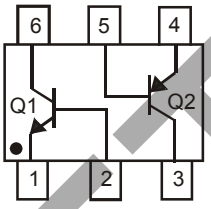
Mechanical Data

- 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_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current – Continuous	I_C	100	mA
Base Current	I_B	30	mA

Maximum Ratings–Q2 PNP @T_A = 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	I_C	-100	mA
Base Current	I_B	-30	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	P_D	300	mW
Thermal Resistance, Junction to Ambient (Note 3)	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-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 @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)							
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	60	—	—	V	I_C = 10μA, I_E = 0
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	50	—	—	V	I_C = 1mA, I_B = 0
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$	5	—	—	V	I_E = 10μA, I_C = 0
Collector Cut-Off Current		I_{CBO}	—	—	0.1	μA	V_{CB} = 60V, I_E = 0
Emitter Cut-Off Current		I_{EBO}	—	—	0.1	μA	V_{EB} = 5V, I_C = 0
ON CHARACTERISTICS (Note 4)							
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	—	0.10	0.25	V	I_C = 100mA, I_B = 10mA
DC Current Gain	DC0150ADJ	h_{FE}	120	—	240	—	V_{CE} = 6V, I_C = 2mA
	DC0150BDJ		200	—	400		
SMALL SIGNAL CHARACTERISTICS							
Transition Frequency		f_T	60	—	—	MHz	V_{CE} = 10V, I_E = -1mA f = 30MHz
Output Capactiance		C_{ob}	—	1.3	—	pF	V_{CB} = 10V, I_E = 0, f = 1MHz

Electrical Characteristics–Q2 PNP @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)							
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	-50	—	—	V	I_C = -10μA, I_E = 0
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	-50	—	—	V	I_C = -1mA, I_B = 0
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$	-5	—	—	V	I_E = -10μA, I_C = 0
Collector Cut-Off Current		I_{CBO}	—	—	-0.1	μA	V_{CB} = -50V, I_E = 0
Emitter Cut-Off Current		I_{EBO}	—	—	-0.1	μA	V_{EB} = -5V, I_C = 0
ON CHARACTERISTICS (Note 4)							
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	—	-0.15	-0.3	V	I_C = -100mA, I_B = -10mA
DC Current Gain	DC0150ADJ	h_{FE}	120	—	240	—	V_{CE} = -6V, I_C = -2mA
	DC0150BDJ		200	—	400		
SMALL SIGNAL CHARACTERISTICS							
Transition Frequency		f_T	80	—	—	MHz	V_{CE} = -10V, I_E = 1mA f = 30MHz
Output Capactiance		C_{ob}	—	1.6	—	pF	V_{CB} = -10V, I_E = 0, f = 1MHz

Notes: 4. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%

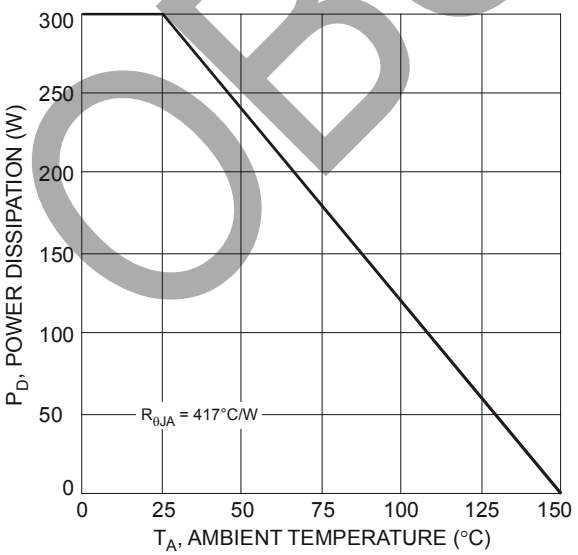


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

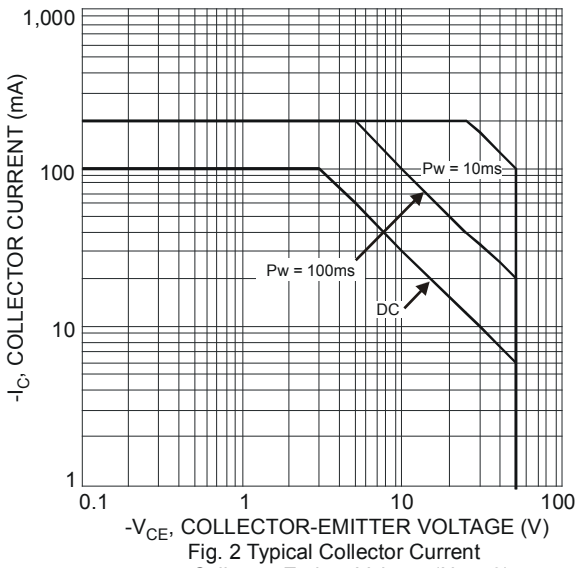


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage (Note 3)

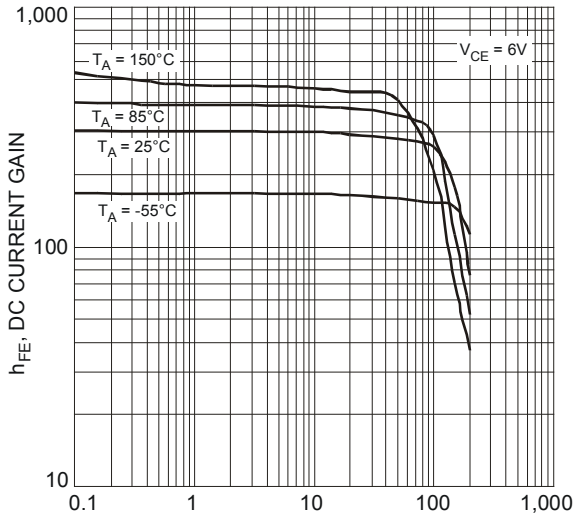


Fig. 3 Typical DC Current Gain
vs. Collector Current (DC0150BDJ-NPN)

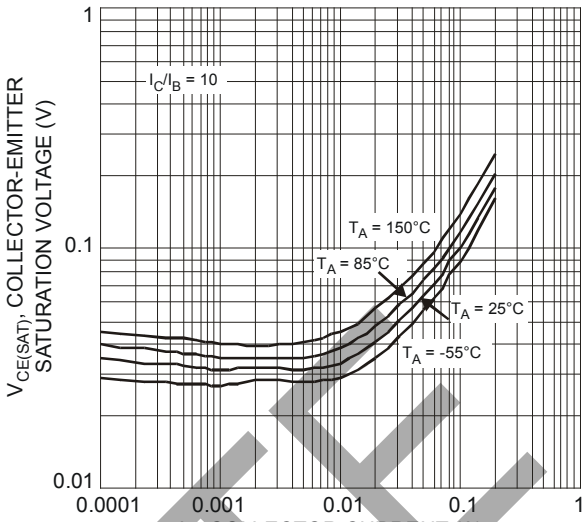


Fig. 4 Typical Collector-Emitter Saturation Voltage
vs. Collector Current (DC0150BDJ-NPN)

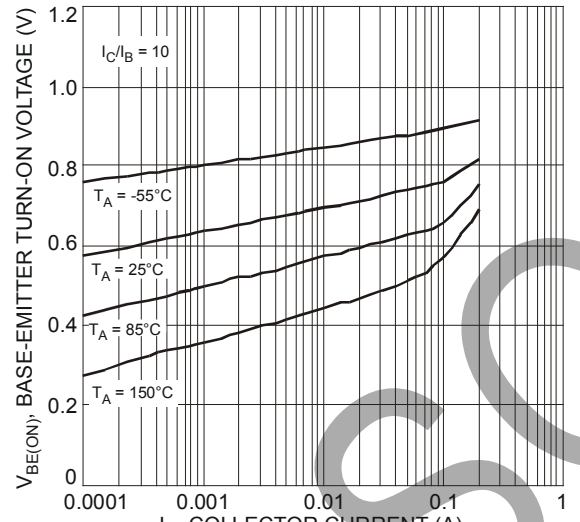


Fig. 5 Typical Base-Emitter Turn-On Voltage
vs. Collector Current (DC0150BDJ-NPN)

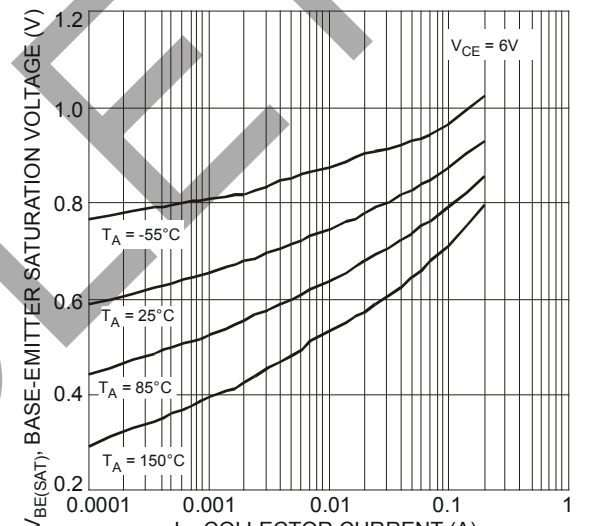


Fig. 6 Typical Base-Emitter Saturation Voltage
vs. Collector Current (DC0150BDJ - NPN)

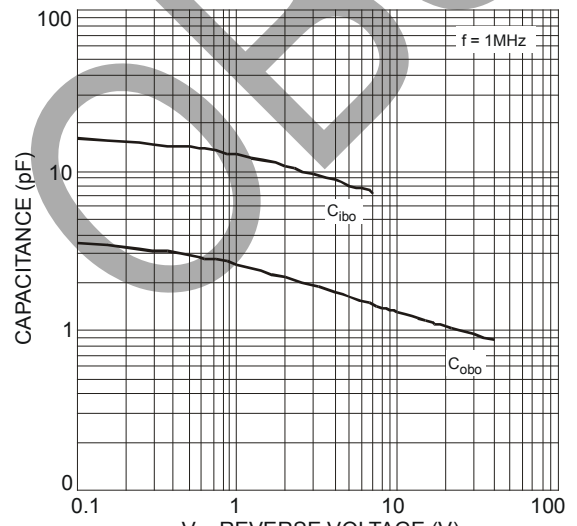


Fig. 7 Typical Capacitance Characteristics
(DC0150BDJ - NPN)

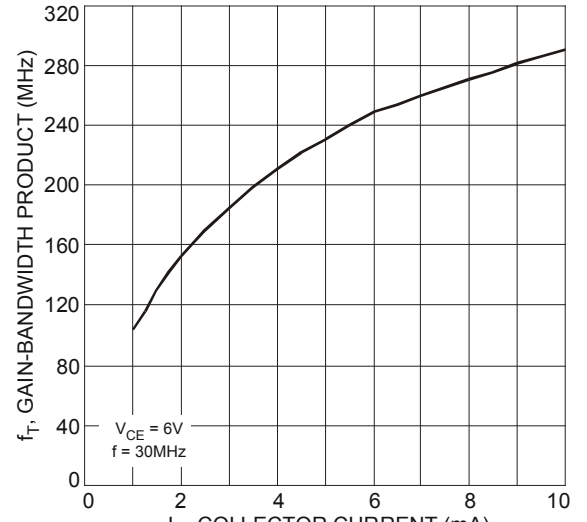


Fig. 8 Typical Gain-Bandwidth Product
vs. Collector Current (DC0150BDJ - NPN)

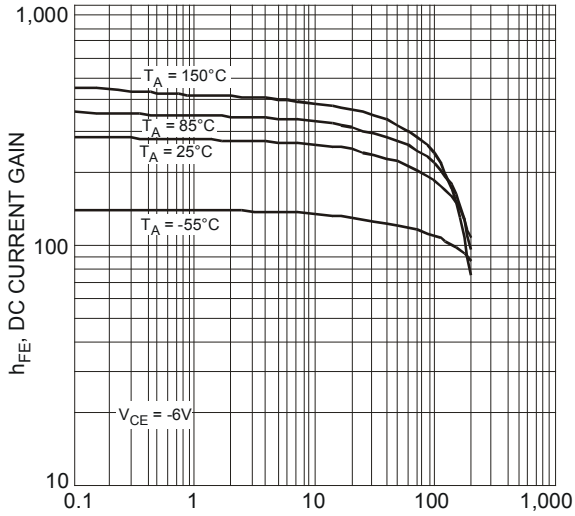


Fig. 9 Typical DC Current Gain
vs. Collector Current (DC0510BDJ - PNP)

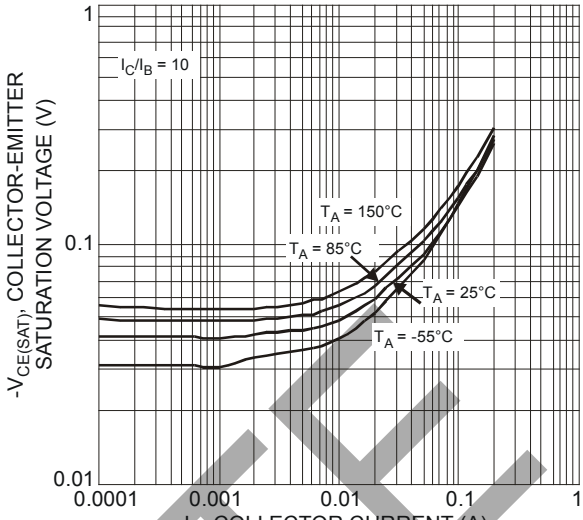


Fig. 10 Typical Collector-Emitter Saturation Voltage
vs. Collector Current (DC0510BDJ - PNP)

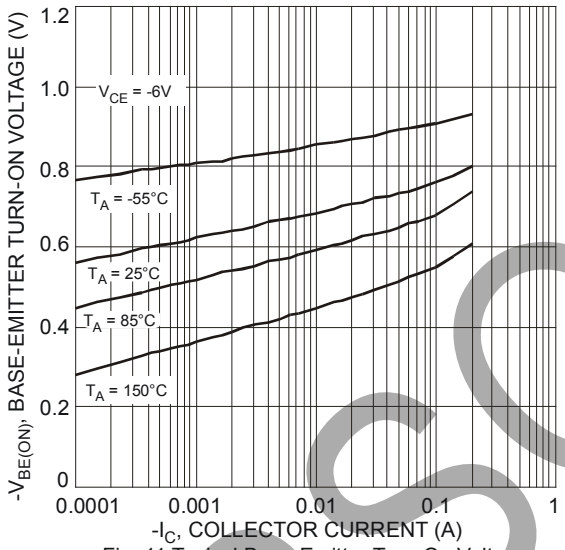


Fig. 11 Typical Base-Emitter Turn-On Voltage
vs. Collector Current (DC0510BDJ - PNP)

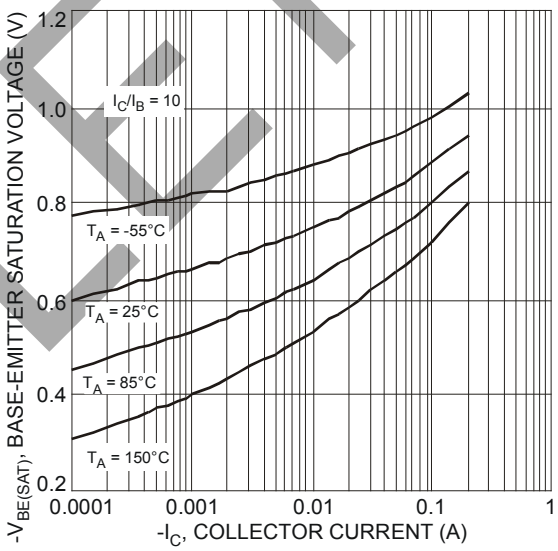


Fig. 12 Typical Base-Emitter Saturation Voltage
vs. Collector Current (DC0150BDJ - PNP)

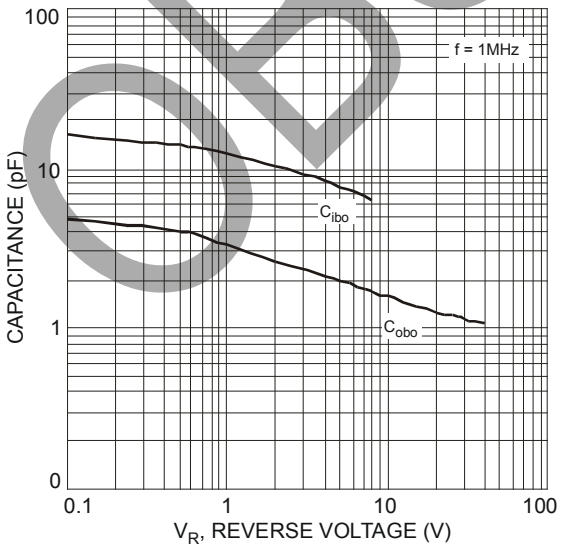


Fig. 13 Typical Capacitance Characteristics
(DC0150BDJ - PNP)

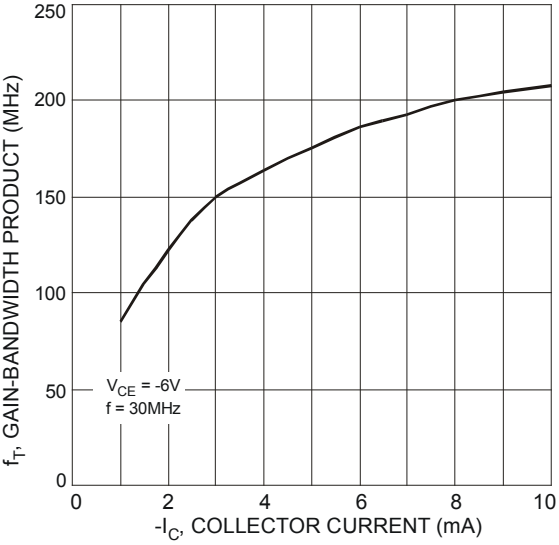


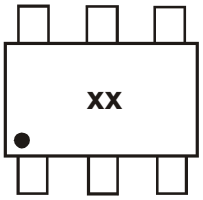
Fig. 14 Typical Gain-Bandwidth Product
vs. Collector Current (DC0510BDJ - PNP)

Ordering Information (Note 5)

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

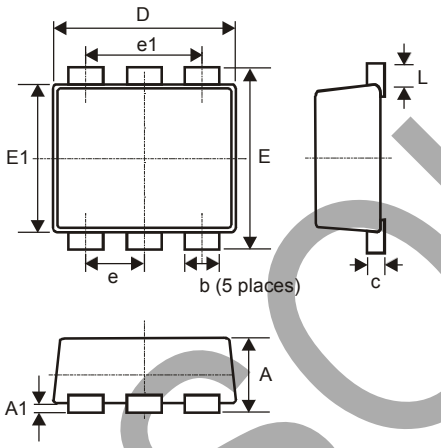
Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



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

Package Outline Dimensions



SOT-963			
Dim	**Min**	**Max**	**Typ**
A	0.40	0.50	0.45
A1	0	0.05	-
c	0.077	0.177	0.127
D	0.95	1.05	1.00
E	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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