NEW PRODUCT

UMC4N

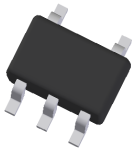
DUAL COMPLEMENTARY PRE-BIASED TRANSISTORS

Features

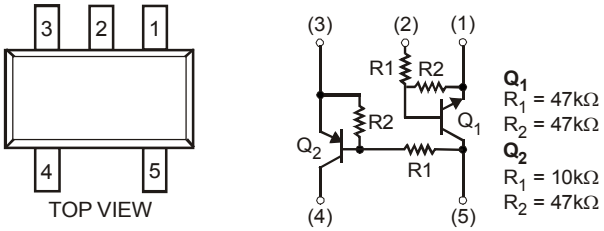
- Epitaxial Planar Die Construction
- Surface Mount Package Suited for Automated Assembly
- Simplifies Circuit Design and Reduces Board Space
- **Lead Free/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

Mechanical Data

- Case: SOT-353
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed Over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.006 grams (approximate)



SOT-353



Schematic and Pin Configuration

Maximum Ratings, Total Device @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	P_D	150	mW
Thermal Resistance, Junction to Ambient Air (Note 3)	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	°C

Maximum Ratings, Pre-Biased NPN Transistor, Q_1 @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	50	V
Input Voltage	V_{IN}	-10 to +40	V
Output Current	I_O	30	mA
Collector Current	$I_{C(MAX)}$	100	mA

Maximum Ratings, Pre-Biased PNP Transistor, Q_2 @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	-50	V
Input Voltage	V_{IN}	-40 to +6	V
Output Current	I_O	-100	mA
Collector Current	$I_{C(MAX)}$	-100	mA

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; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.

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Electrical Characteristics, Pre-Biased NPN Transistor, Q_1 @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	$V_{I(off)}$	—	—	0.5	V	V_{CC} = 5V, I_O = 100μA
	$V_{I(on)}$	3	—	—	V	V_O = 0.3V, I_O = 2mA
Output Voltage	$V_{O(on)}$	—	0.1	0.3	V	I_O/ I_I = 10mA/0.5 mA
Input Current	I_I	—	—	0.18	mA	V_I = 5V
Output Current	$I_{O(off)}$	—	—	0.5	μA	V_{CC} = 50V, V_I = 0V
DC Current Gain	G_I	68	—	—	—	V_O = 5V, I_O = 5mA
Gain-Bandwidth Product	f_T	—	250	—	MHz	V_{CE} = 10V, I_E = -5mA, f = 100MHz*
Input Resistance	R_1	32.9	47	61.1	kΩ	—
Resistance Ratio	R_2/R_1	0.8	1	1.2	—	—

*Characteristic of Transistor – for reference only.

Electrical Characteristics, Pre-Biased PNP Transistor, Q_2 @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	$V_{I(off)}$	—	—	-0.3	V	V_{CC} = -5V, I_O = -100μA
	$V_{I(on)}$	-1.4	—	—	V	V_O = -0.3V, I_O = -1mA
Output Voltage	$V_{O(on)}$	—	-0.1	-0.3	V	I_O/ I_I = -5mA/-0.25 mA
Input Current	I_I	—	—	-0.88	mA	V_I = -5V
Output Current	$I_{O(off)}$	—	—	-0.5	μA	V_{CC} = -50V, V_I = 0V
DC Current Gain	G_I	68	—	—	—	V_O = -5V, I_O = -5mA
Gain-Bandwidth Product	f_T	—	250	—	MHz	V_{CE} = -10V, I_E = 5mA, f = 100MHz*
Input Resistance	R_1	7	10	13	kΩ	—
Resistance Ratio	R_2/R_1	3.7	4.7	5.7	—	—

*Characteristic of Transistor – for reference only.

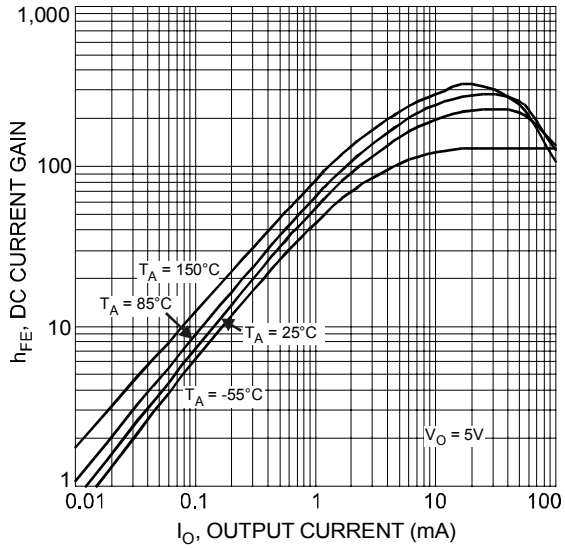


Fig. 1 Typical DC Current Gain vs. Output Current (Q1, NPN)

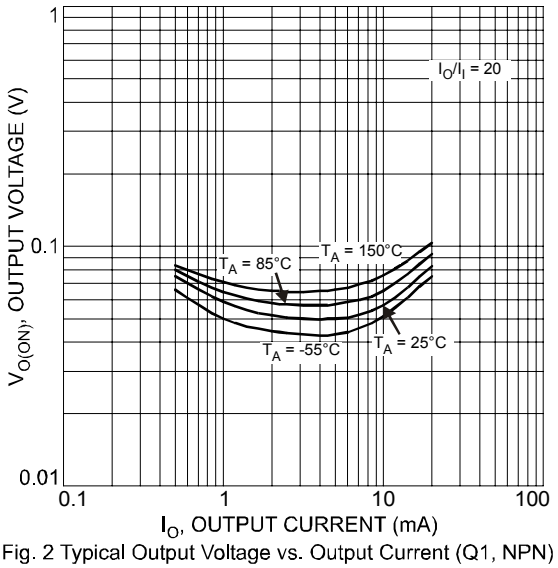


Fig. 2 Typical Output Voltage vs. Output Current (Q1, NPN)

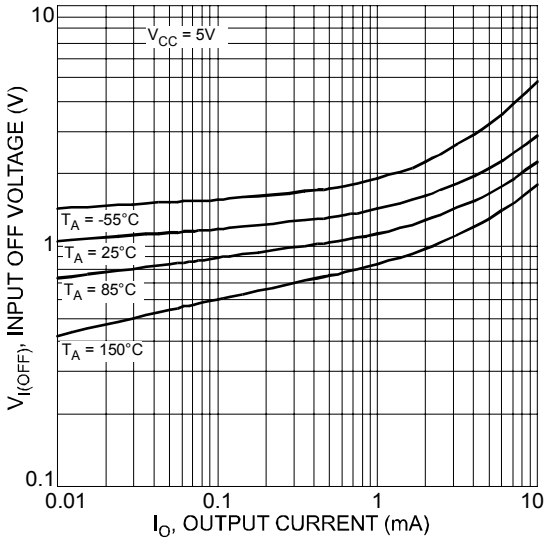


Fig. 3 Typical Input OFF Voltage
vs. Output Current (Q1, NPN)

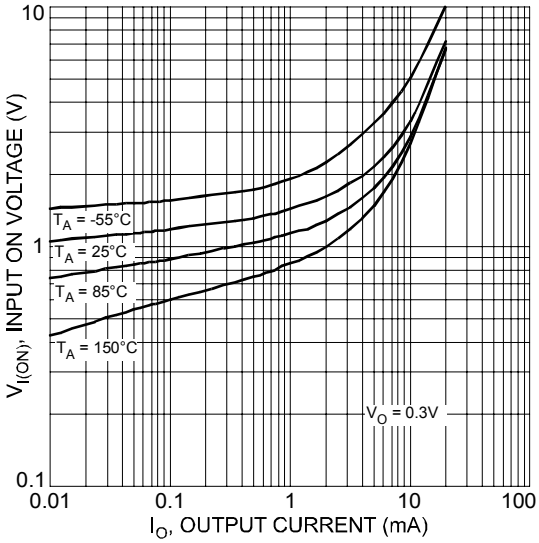


Fig. 4 Typical Input ON Voltage
vs. Output Current (Q1, NPN)

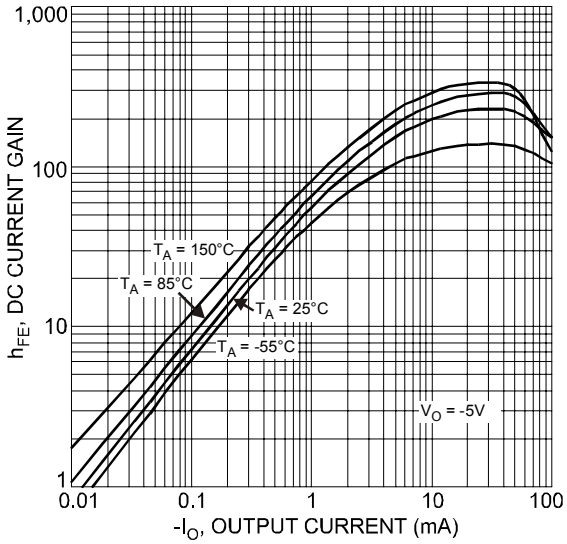


Fig. 5 Typical DC Current Gain
vs. Output Current (Q2, PNP)

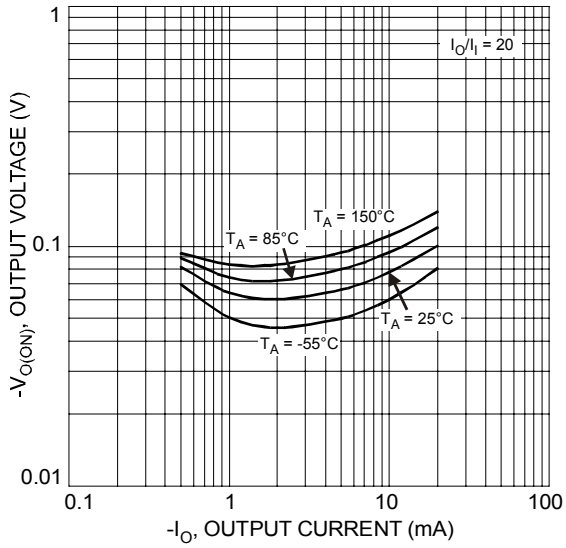


Fig. 6 Typical Output Voltage
vs. Output Current (Q2, PNP)

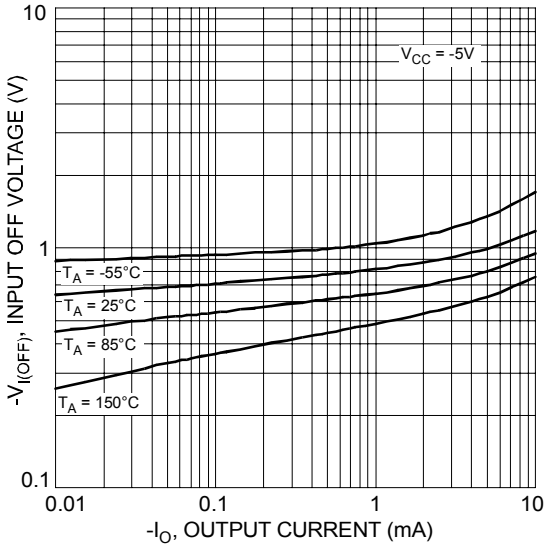


Fig. 7 Typical Input Off Voltage
vs. Output Current (Q2, PNP)

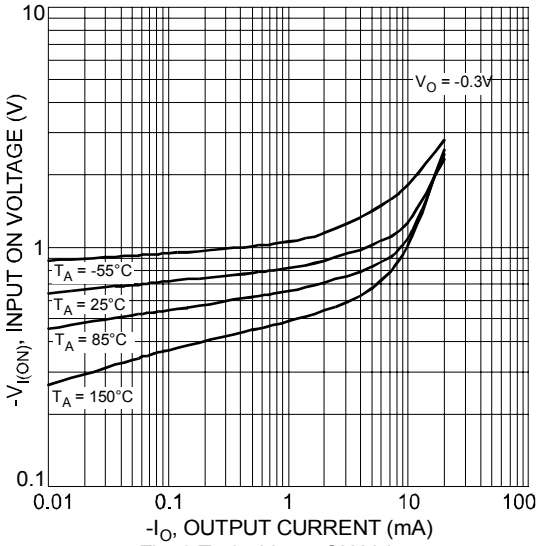


Fig. 8 Typical Input ON Voltage
vs. Output Current (Q2, PNP)

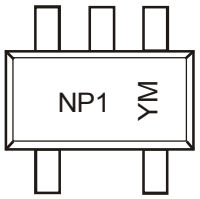
NEW PRODUCT

Ordering Information (Note 4)

Device	Packaging	Shipping
UMC4N-7	SOT-353	3000/Tape & Reel

Notes: 4. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



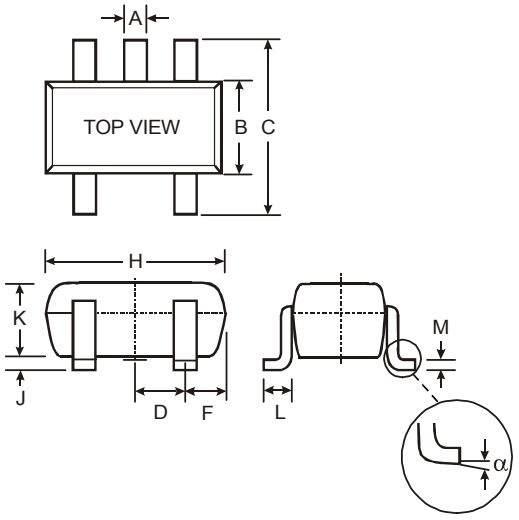
NP1 = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: U = 2007
M = Month ex: 9 = September

Date Code Key

Year	2007	2008	2009	2010	2011	2012
Code	U	V	W	X	Y	Z

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

Package Outline Dimensions



SOT-353		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
F	0.30	0.40
H	1.80	2.20
J	—	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
α	0°	8°
All Dimensions in mm		