



UMD9

DUAL TRANSISTOR

DUAL DIGITAL TRANSISTOR (BUILT-IN BIAS RESISTORS)

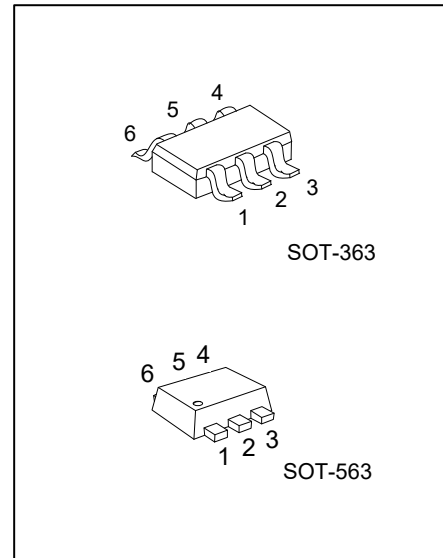
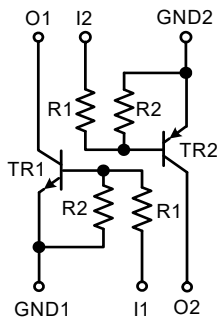
■ DESCRIPTION

The UTC **UMD9** is an dual transistor; it uses UTC's advanced technology to provide the customers with low collector -emitter saturation voltage, etc.

■ FEATURES

- * NPN/PNP silicon transistor(Built-in resistor type)
- * Low collector-emitter saturation voltage
- * With built-in bias resistors
- * Simplify circuit design

■ EQUIVALENT CIRCUIT



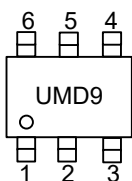
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment						Packing
Lead Free	Halogen Free		1	2	3	4	5	6	
UMD9L-AL6-R	UMD9G-AL6-R	SOT-363	G1	I1	O2	G2	I2	O1	Tape Reel
UMD9L-AN6-R	UMD9G-AN6-R	SOT-563	G1	I1	O2	G2	I2	O1	Tape Reel

Note: Pin Assignment: G: GND I: IN O: OUT

<p>UMD9G-AL6-R</p> <ul style="list-style-type: none"> (1)Packing Type (2)Package Type (3)Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) AL6: SOT-363, AN6: SOT-563 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS		UNIT
			TR1 (NPN)	TR2 (PNP)	
Collector-Base Voltage		V _{CBO}	50	-50	V
Collector-Emitter Voltage		V _{CEO}	50	-50	V
Emitter-Base Voltage		V _{EBO}	6	-6	V
Input Voltage		V _{IN}	-6 ~ +40	-40 ~ +6	V
Output Current		I _{OUT}	100	-100	mA
Power Dissipation	SOT-363	P _C	300		mW
	SOT-563		250		mW
Junction Temperature		T _J	+150		°C
Ambient Temperature		T _A	-55 ~ +150		°C
Storage Temperature		T _{STG}	-55 ~ +150		°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-363	θ _{JA}	417 (Note)	°C/W
	SOT-563		500 (Note)	°C/W

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

TR1 (NPN)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	V _{(BR)CBO}	I _C =100μA, I _E =0A	50			V
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	I _C =2mA, I _B =0A	50			V
Collector-Base Cut-Off Current	I _{CBO}	V _{CB} =50V, I _E =0A			100	nA
Collector-Emitter Cut-Off Current	I _{CEO}	V _{CE} =30V, I _B =0A			1	μA
Emitter-Base Cut-Off Current	I _{EBO}	V _{EB} =5V, I _C =0A			150	μA
DC Current Gain	h _{FE}	V _{CE} =5V, I _C =5mA	100			
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	I _C =5mA, I _B =0.25mA			100	mV
Off-State Input Voltage	V _{I(OFF)}	V _{CE} =5V, I _C =100μA			0.8	V
On-State Input Voltage	V _{I(ON)}	V _{CE} =0.3V, I _C =10mA	3			V
Bias Resistor 1 (Input)	R1		7	10	13	KΩ
Bias Resistor Ratio	R2/R1		3.7	4.7	5.7	
Transition Frequency	f _T	V _{CE} =5V, I _C =10mA, f=100MHz		230		MHz

Note: Transition frequency of the device.

■ ELECTRICAL CHARACTERISTICS (Cont.)

TR2 (PNP)

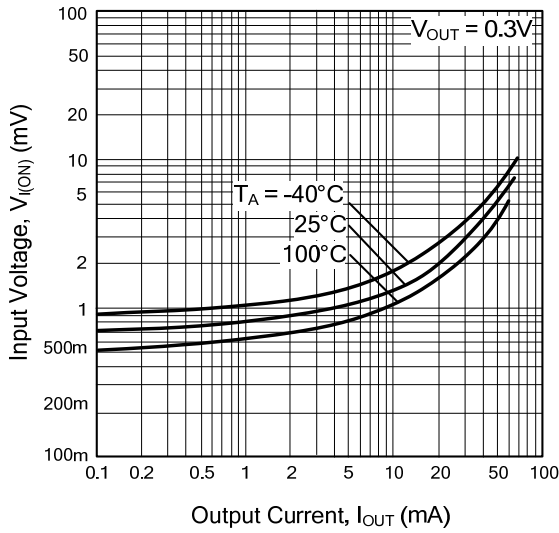
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=-100\mu A, I_E=0A$	-50			V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=-2mA, I_B=0A$	-50			V
Collector-Base Cut-Off Current	I_{CBO}	$V_{CB}=-50V, I_E=0A$			-100	nA
Collector-Emitter Cut-Off Current	I_{CEO}	$V_{CE}=-30V, I_B=0A$			-1	μA
Emitter-Base Cut-Off Current	I_{EBO}	$V_{EB}=-5V, I_C=0A$			-150	μA
DC Current Gain	h_{FE}	$V_{CE}=-5V, I_C=-5mA$	100			
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=-5mA, I_B=-0.25mA$			-100	mV
Off-State Input Voltage	$V_{I(OFF)}$	$V_{CE}=-5V, I_C=-100\mu A$			-0.8	V
On-State Input Voltage	$V_{I(ON)}$	$V_{CE}=-0.3V, I_C=-10mA$	-3			V
Bias Resistor 1 (Input)	R1		7	10	13	K Ω
Bias Resistor Ratio	R2/R1		3.7	4.7	5.7	
Transition Frequency	f_T	$V_{CE}=-5V, I_C=-10mA, f=100MHz$		180		MHz

Note: Transition frequency of the device.

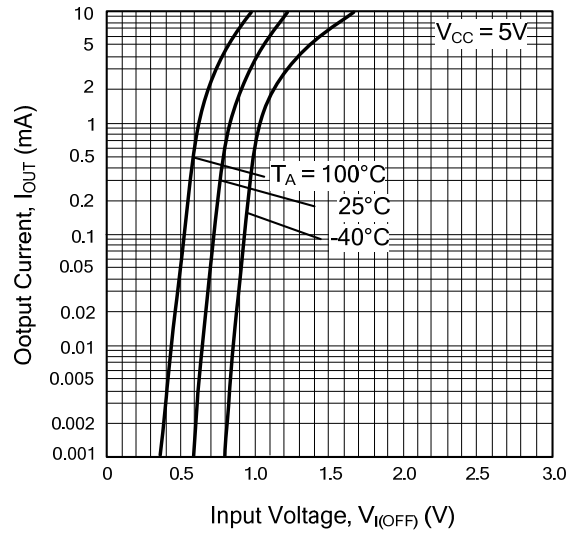
■ TYPICAL CHARACTERISTICS

TR1 (NPN)

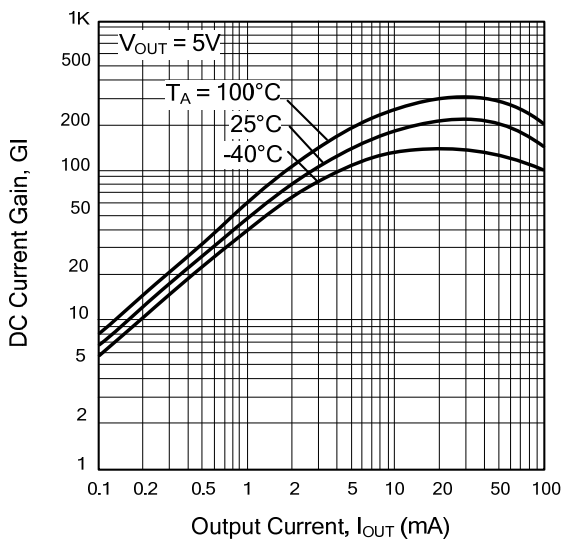
Input Voltage vs. Output Current
(ON Characteristics)



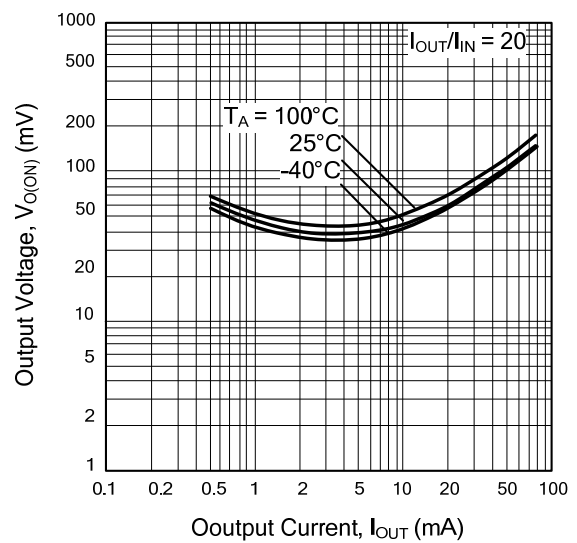
Output Current vs. Input Voltage
(OFF Characteristics)



DC Current Gain vs. Output Current

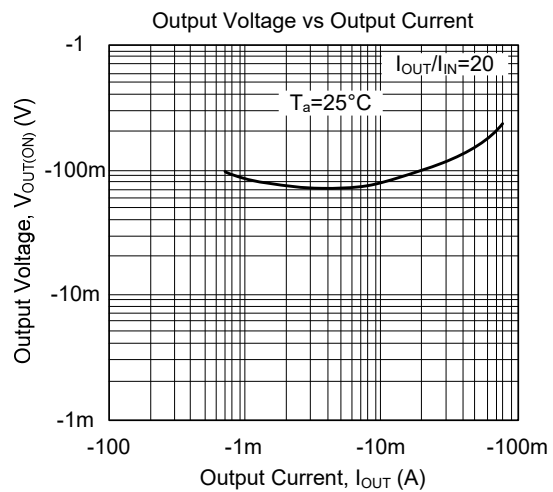
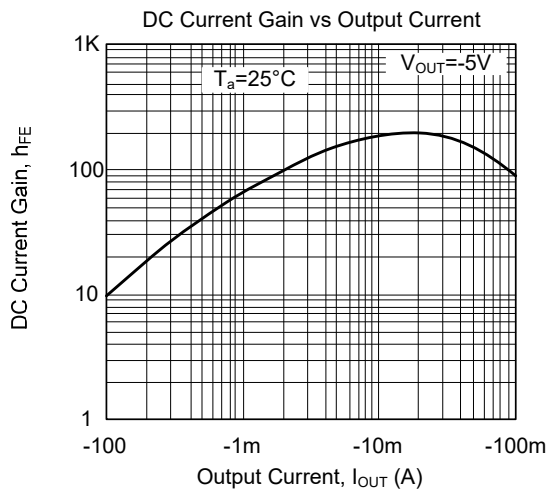
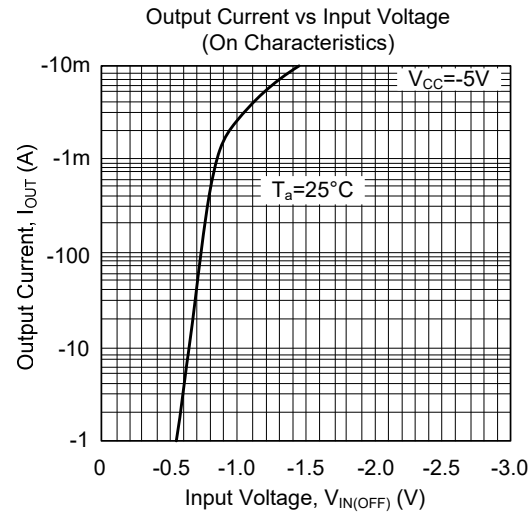
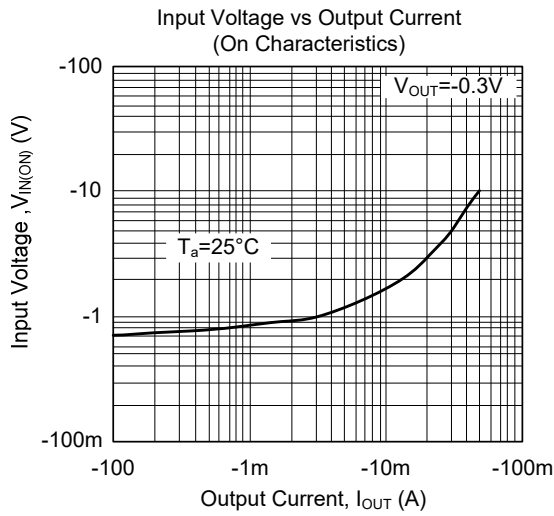


Output Voltage vs. Output Current



■ TYPICAL CHARACTERISTICS (Cont.)

TR2 (PNP)



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