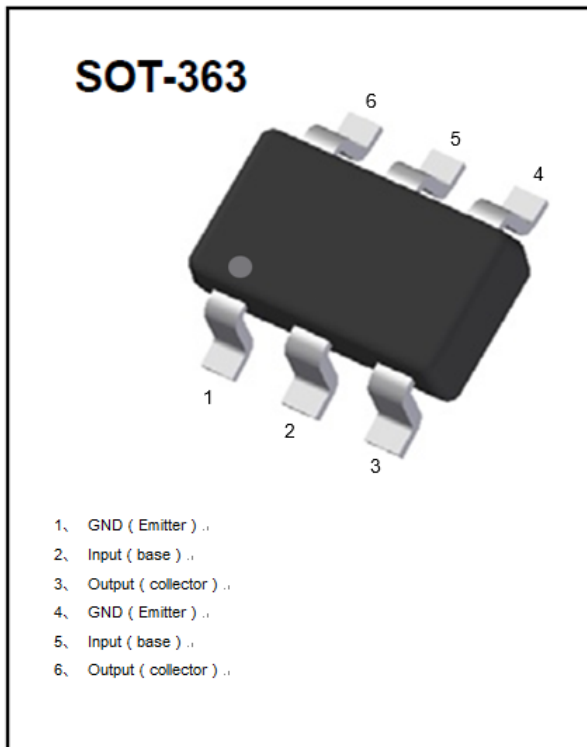


## Digital Transistors (Built-in Resistors)



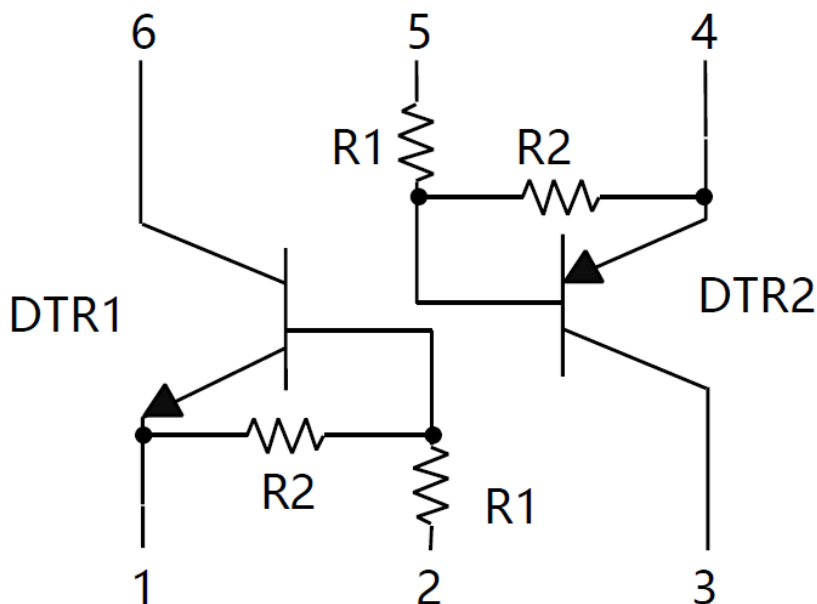
### Features

- Epoxy meets UL-94 V-0 flammability rating
- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors
- Surface mount package ideally Suited for Automatic Insertion

### Mechanical Data

- **Package:** SOT-363
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** D9

### ■Equivalent circuit





# UMD9N

## ■Maximum Ratings (Ta=25°C Unless otherwise specified)

### DTR1-NPN

ITEM	SYMBOL	UNIT	CONDITIONS	VALUE
Supply Voltage	$V_{CC}$	V		50
Input Voltage	$V_{IN}$	V		-6 to +40
Output Current	$I_o$	mA		100
Power Dissipation	$P_D$	mW		150
Junction Temperature (Single)	$T_j$	°C		150
Storage Temperature	$T_{STG}$	°C		-55 to +150

### DTR2-PNP

ITEM	SYMBOL	UNIT	CONDITIONS	VALUE
Supply Voltage	$V_{CC}$	V		-50
Input Voltage	$V_{IN}$	V		-40 to +6
Output Current	$I_o$	mA		-100
Power Dissipation	$P_D$	mW		150
Junction Temperature	$T_j$	°C		150
Storage Temperature	$T_{STG}$	°C		-55 to +150

## ■Electrical Characteristics (Ta=25°C unless otherwise specified)

### DTR1-NPN

ITEM	SYMBOL	UNIT	CONDITIONS	MIN	TYP	MAX
Input voltage	$V_{I(off)}$	V	$V_{CC}=5V, I_c=100\mu A$	0.3	-	-
	$V_{I(on)}$	V	$V_o=0.3V, I_c=1mA$	-	-	1.4
Output voltage	$V_{O(on)}$	V	$I_o / I_i = 5mA / 0.25 mA$	-	-	0.3
Input current	$I_i$	mA	$V_i=5V$	-	-	0.88
Output current	$I_{O(off)}$	$\mu A$	$V_{CC}=50V, V_i=0$	-	-	0.5
DC current gain	$G_i$		$V_o=5V, I_o = 5mA$	68	-	-
Input resistance	$R_1$	k $\Omega$		7	10	13
Resistance ratio	$R_2/R_1$			3.7	4.7	5.7
Transition frequency	$f_T$	MHz	$V_{CE}=10V, I_E=5mA, f=100MHz$	-	250	-



# UMD9N

## DTR2-PNP

ITEM	SYMBOL	UNIT	CONDITIONS	MIN	TYP	MAX
Input voltage	$V_{I(off)}$	V	$V_{CC}=-5V, I_c=-100\mu A$	-0.3	-	-
	$V_{I(on)}$	V	$V_o=-0.3V, I_c=-1mA$	-	-	-1.4
Output voltage	$V_{O(on)}$	V	$I_o / I_i = -5mA / -0.25 mA$	-	-	-0.3
Input current	$I_i$	mA	$V_i = -5V$	-	-	-0.88
Output current	$I_{O(off)}$	$\mu A$	$V_{CC} = -50V, V_i = 0$	-	-	-0.5
DC current gain	$G_i$		$V_o = -5V, I_o = -5mA$	68	-	-
Input resistance	$R_i$	$k\Omega$		7	10	13
Resistance ratio	$R_2/R_1$			3.7	4.7	5.7
Transition frequency	$f_T$	MHz	$V_{CE} = -10V, I_E = -5mA, f = 100MHz$	-	250	-

### Ordering Information (Example)

PREFERRED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
UMD9N	F2	Approximate 0.009g	3000	30000	120000	7" reel

### Characteristics (Typical)

Fig. 1 - DTR1 DC Current Gain Characteristics

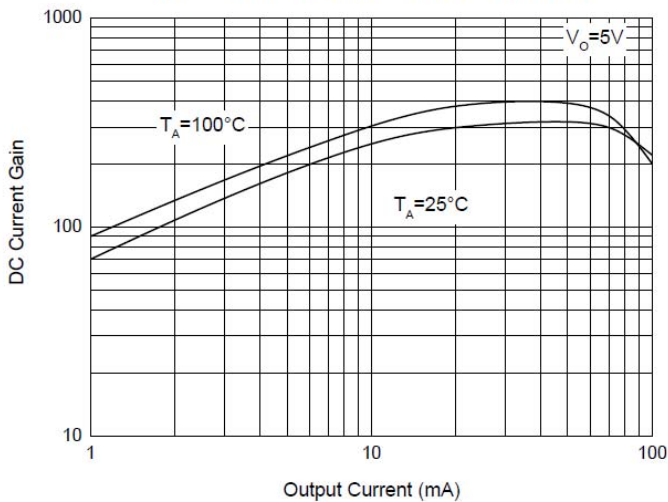


Fig. 2 - DTR1 Input Voltage (on) Characteristics

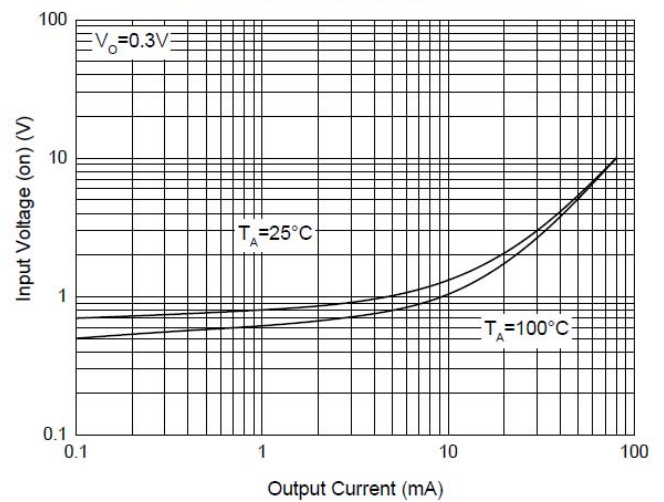




Fig. 3 - DTR1 Input Voltage (off) Characteristics

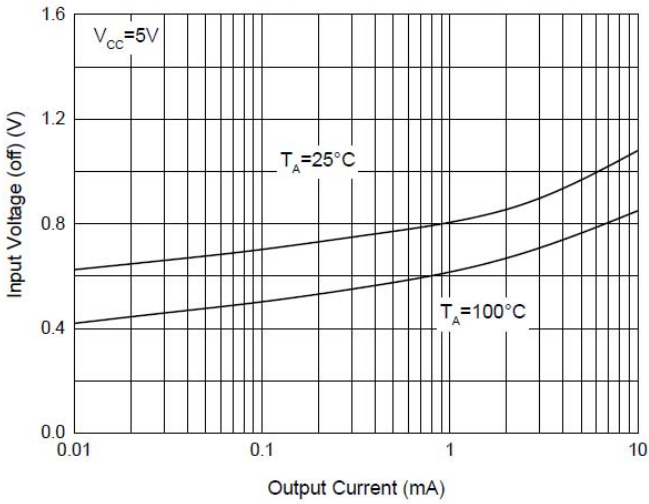


Fig. 4 - DTR1 Output Voltage Characteristics

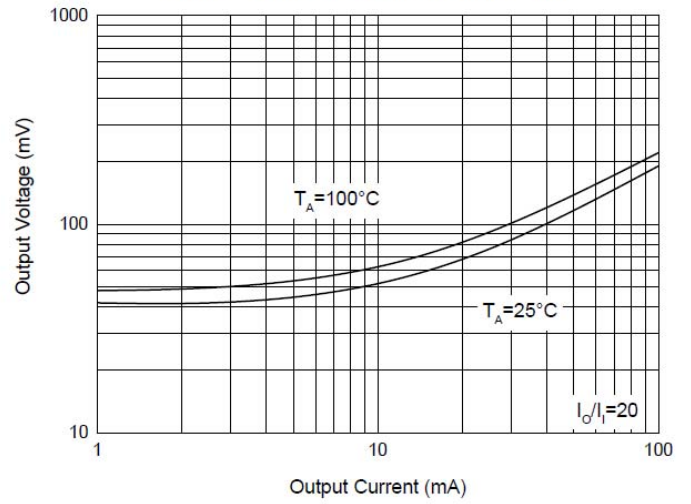


Fig. 5 - DTR2 DC Current Gain Characteristics

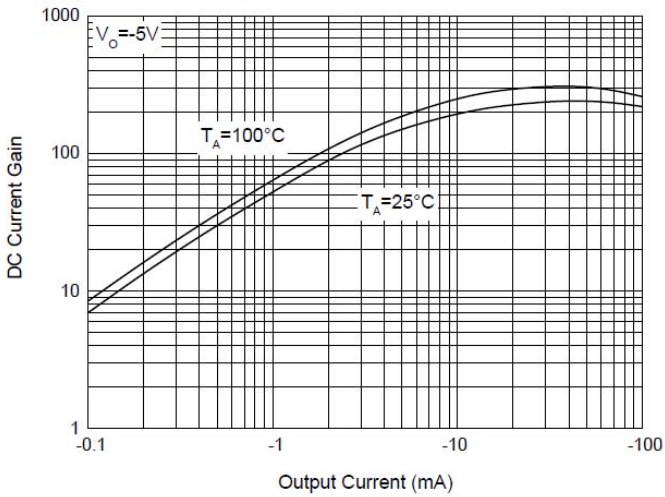


Fig. 6 - DTR2 Input Voltage (on) Characteristics

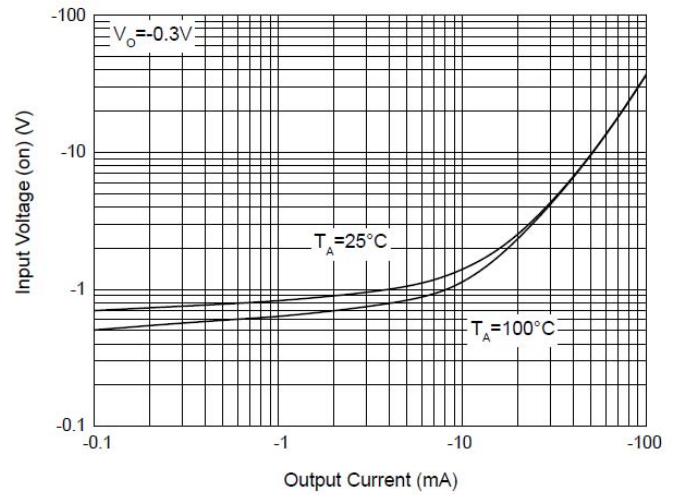


Fig. 7 - DTR2 Input Voltage (off) Characteristics

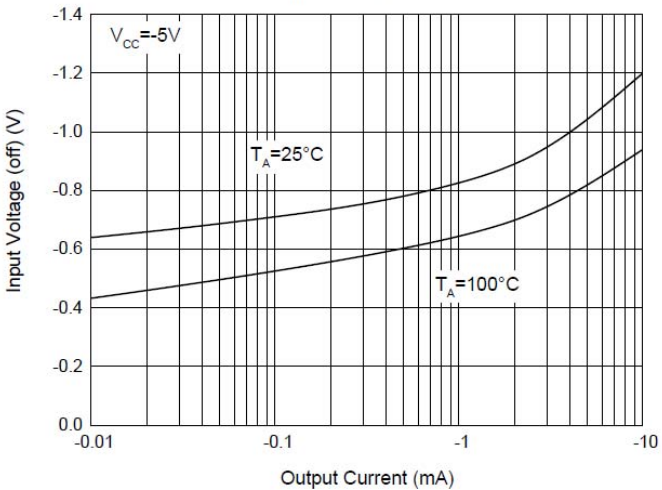
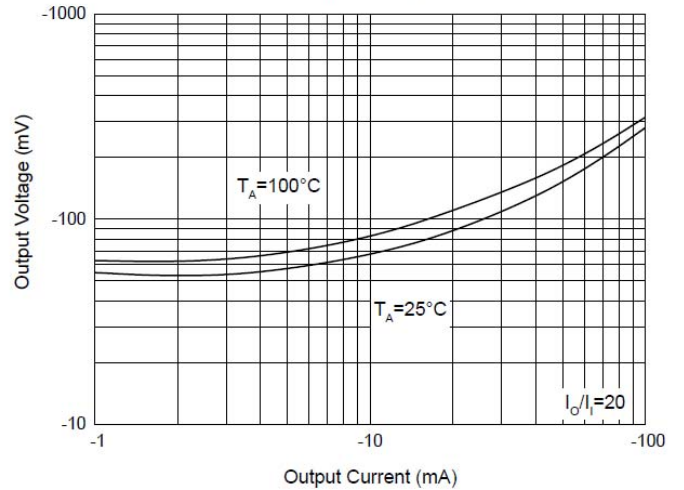


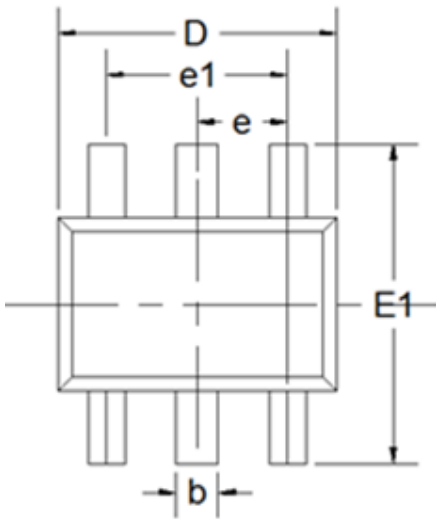
Fig. 8 - DTR2 Output Voltage Characteristics



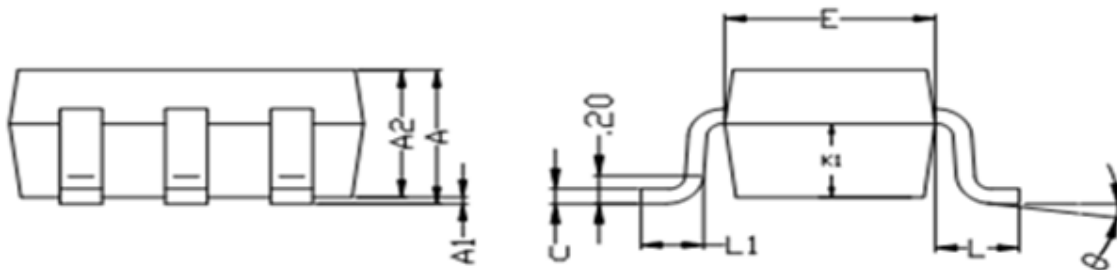


# UMD9N

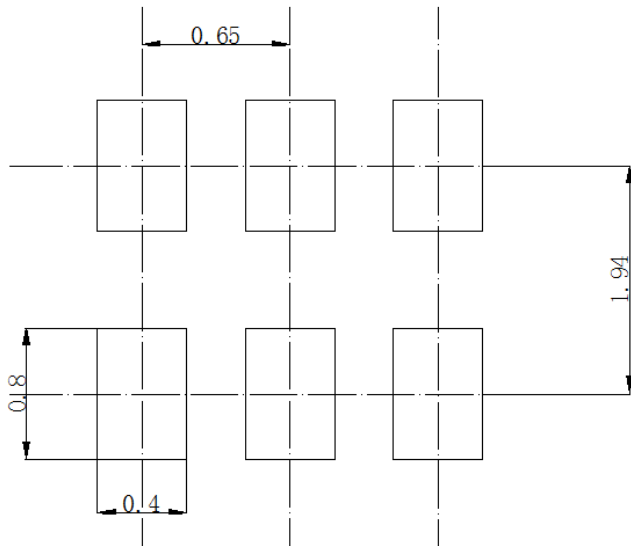
## ■SOT-363 Package Outline Dimensions



DIM	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.035	0.043	0.9	1.1
A1	0	0.004	0	0.1
A2	0.035	0.039	0.9	1
b	0.006	0.014	0.15	0.35
c	0.002	0.01	0.05	0.25
D	0.071	0.087	1.8	2.2
E	0.045	0.053	1.15	1.35
E1	0.085	0.096	2.15	2.45
e	0.026Typ		0.65Typ	
e1	0.047	0.055	1.2	1.4
L	0.021Typ		0.525Typ	
L1	0.01	0.018	0.26	0.46
φ	0°	8°	0°	8°



## ■SOT-363 Suggested Pad Layout



Unit: mm



## UMD9N

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