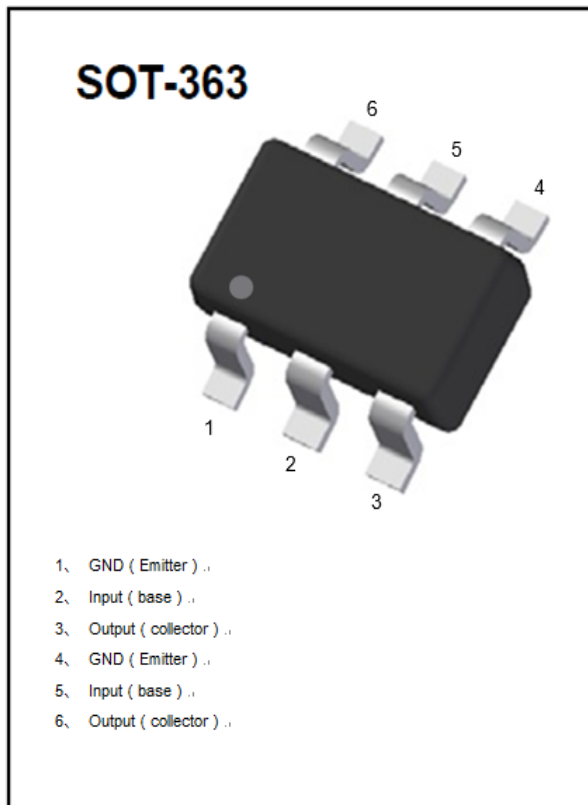


NPN&PNP Digital Transistors (Built-in Resistors)

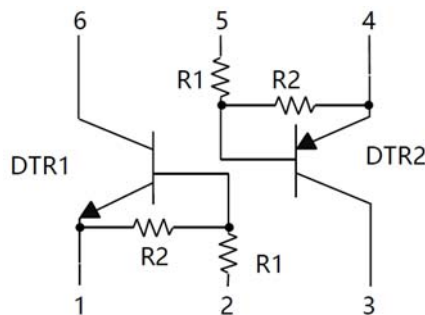


Features

- 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:** D13
- **Equivalent circuit**



■Maximum Ratings (Ta=25℃ Unless otherwise specified)

DTR1-NPN

ITEM	SYMBOL	UNIT	CONDITIONS	VALUE
Supply Voltage	V_{CC}	V		50
Input Voltage	V_{IN}	V		-5 to +30
Output Current	I_O	mA		100
Power Dissipation	P_D	mW		150
Junction Temperature (Single)	T_J	℃		150
Storage Temperature	T_{STG}	℃		-55 to +150

DTR2-PNP

ITEM	SYMBOL	UNIT	CONDITIONS	VALUE
Supply Voltage	V_{CC}	V		-50
Input Voltage	V_{IN}	V		-30 to +5
Output Current	I_O	mA		-100
Power Dissipation	P_D	mW		150
Junction Temperature	T_J	℃		150
Storage Temperature	T_{STG}	℃		-55 to +150



UMD13N

■Electrical Characteristics (Ta=25℃ unless otherwise specified) DTR1-NPN

ITEM	SYMBOL	UNIT	CONDITIONS	MIN	TYP	MAX
Input voltage	$V_{I(off)}$	V	$V_{CC}=5V, I_c=100\mu A$	0.5	-	-
	$V_{I(on)}$	V	$V_O=0.3V, I_c=5mA$	-	-	1.3
Output voltage	$V_{O(on)}$	V	$I_o / I_i = 10mA / 0.5 mA$	-	-	0.3
Input current	I_i	mA	$V_i=5V$	-	-	1.8
Output current	$I_{O(off)}$	μA	$V_{CC}=50V, V_i=0$	-	-	0.5
DC current gain	G_i		$V_o=5V, I_o = 10mA$	80	-	-
Input resistance	R_i	k Ω		3.3	4.7	6.1
Resistance ratio	R_2/R_i			8	10	12
Transition frequency	f_T	MHz	$V_{CE}=10V, I_E=5mA, f=100MHz$	-	250	-

DTR2-PNP

ITEM	SYMBOL	UNIT	CONDITIONS	MIN	TYP	MAX
Input voltage	$V_{I(off)}$	V	$V_{CC}=-5V, I_c=-100\mu A$	-0.5	-	-
	$V_{I(on)}$	V	$V_O=-0.3V, I_c=-2mA$	-	-	-1.3
Output voltage	$V_{O(on)}$	V	$I_o / I_i = -10mA / -0.5 mA$	-	-	-0.3
Input current	I_i	mA	$V_i=-5V$	-	-	-1.8
Output current	$I_{O(off)}$	μA	$V_{CC}=-50V, V_i=0$	-	-	-0.5
DC current gain	G_i		$V_o=-5V, I_o = -10mA$	80	-	-
Input resistance	R_i	k Ω		3.3	4.7	6.1
Resistance ratio	R_2/R_i			8	10	12
Transition frequency	f_T	MHz	$V_{CE}=-10V, I_E=-5mA, f=100MHz$	-	250	-

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
UMD13N	F2	Approximate 0.009g	3000	30000	120000	7" reel



■ Characteristics (Typical)

DTR1-NPN

Fig. 1 - DC Current Gain Characteristics

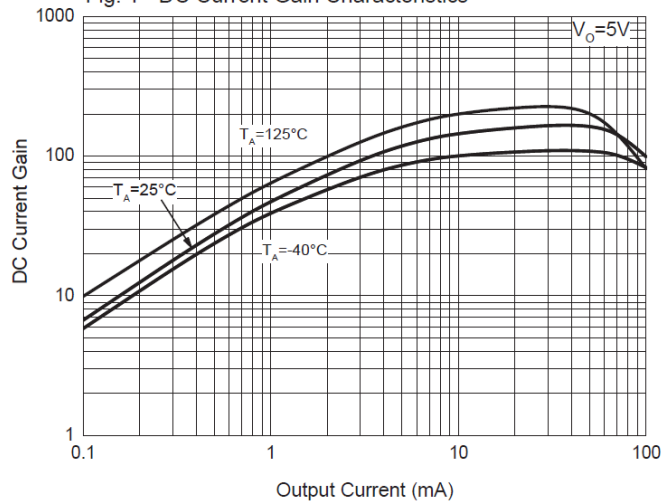


Fig. 2 - Input Voltage (on) Characteristics

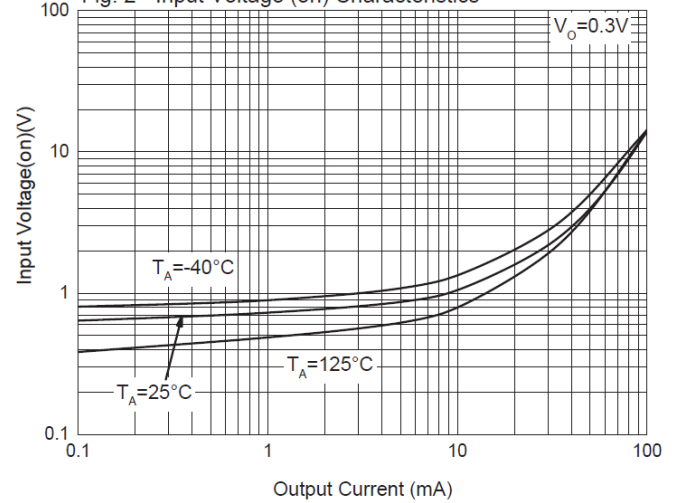


Fig. 3 - Input Voltage (off) Characteristics

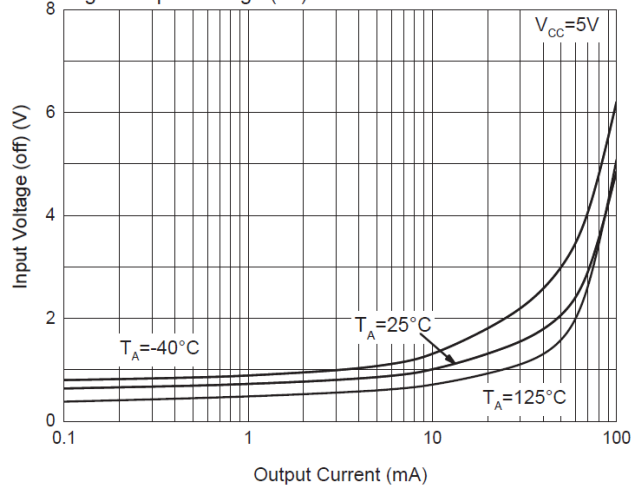


Fig. 4 - Output Voltage Characteristics

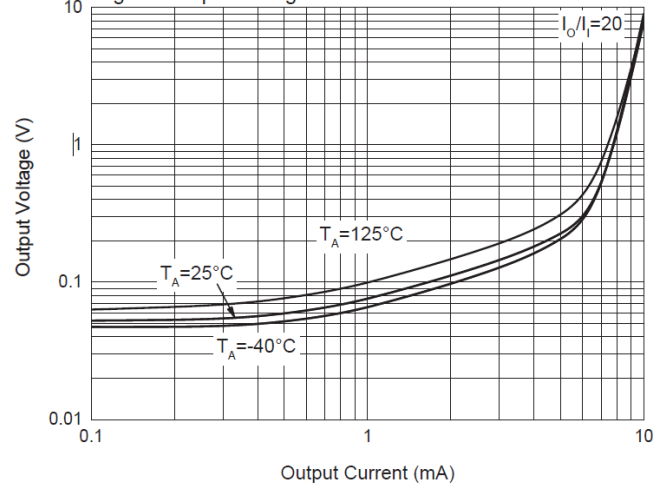
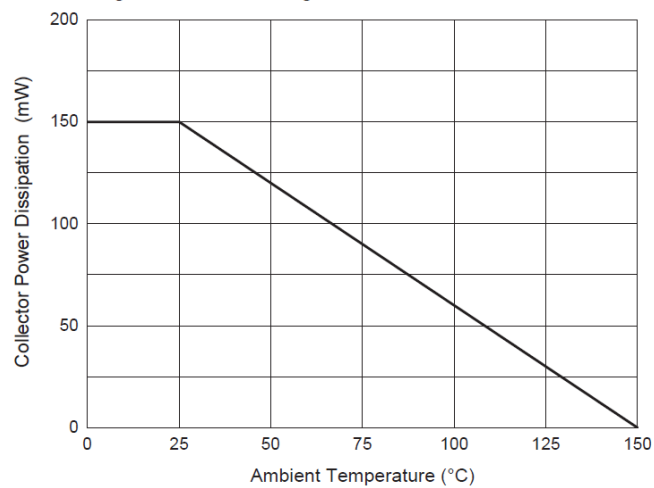


Fig. 5 - Power Derating Curve





■ Characteristics (Typical)

DTR1-PNP

Fig. 1 - DC Current Gain Characteristics

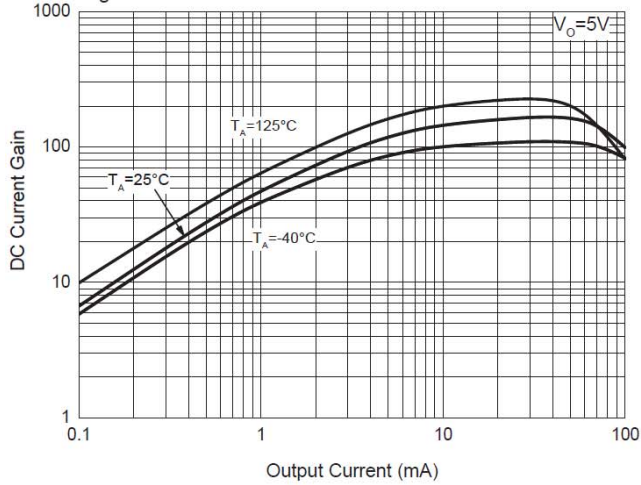


Fig. 2 - Input Voltage (on) Characteristics

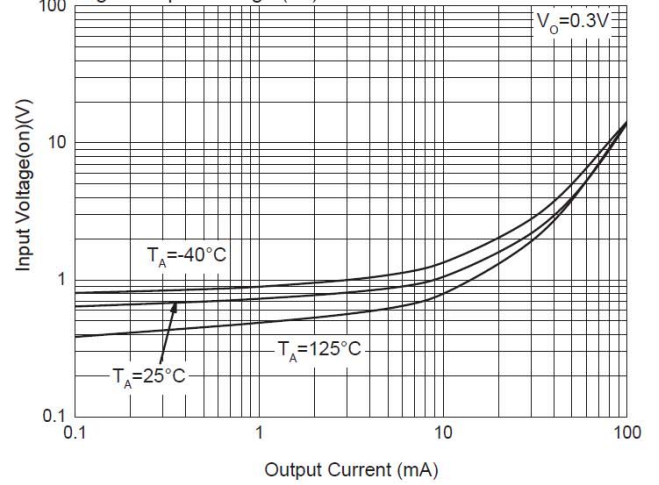


Fig. 3 - Input Voltage (off) Characteristics

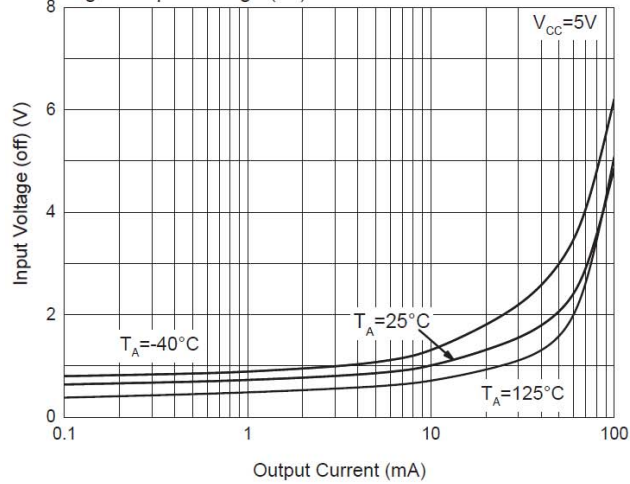


Fig. 4 - Output Voltage Characteristics

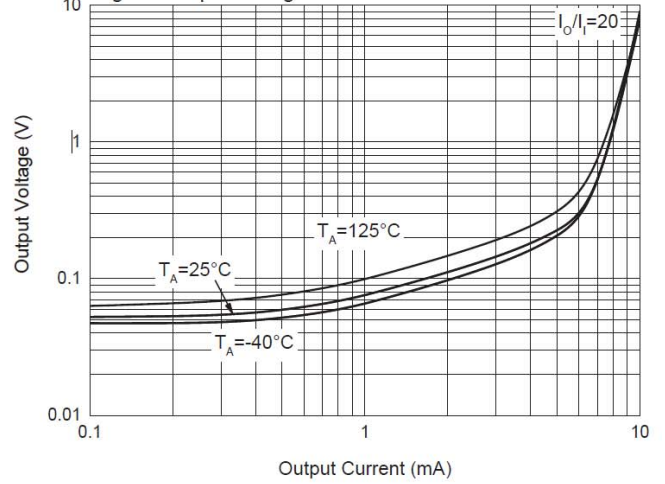
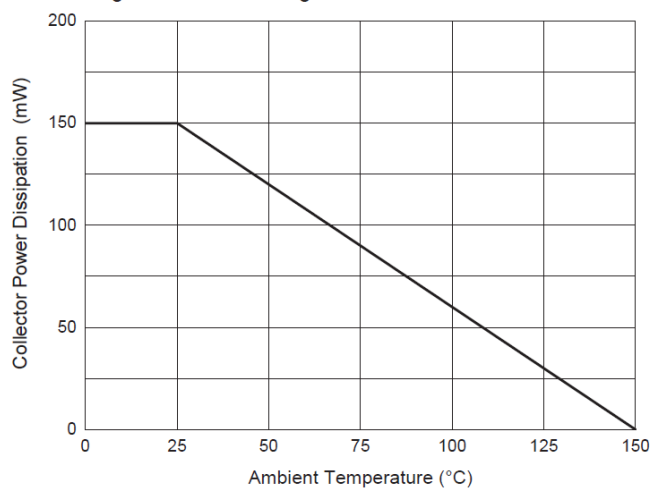


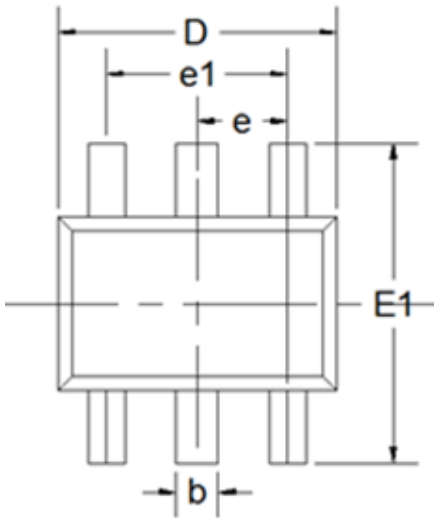
Fig. 5 - Power Derating Curve



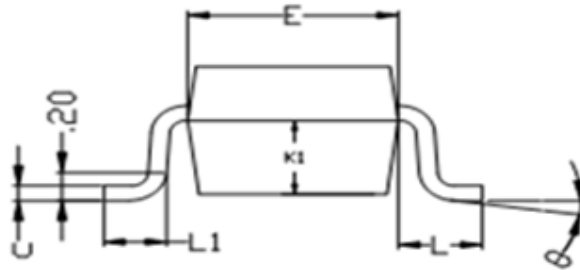
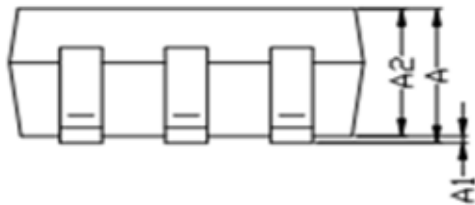


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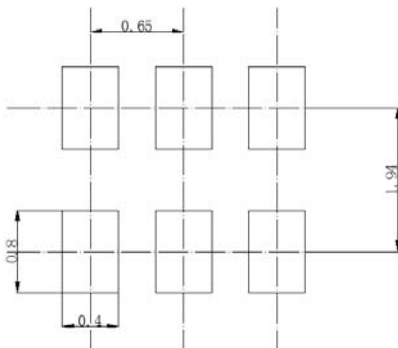
■SOT-363 Package Outline Dimensions



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



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