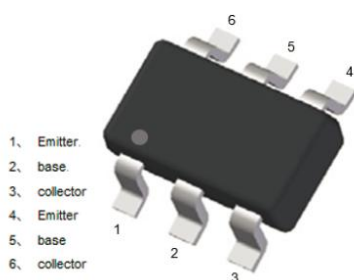
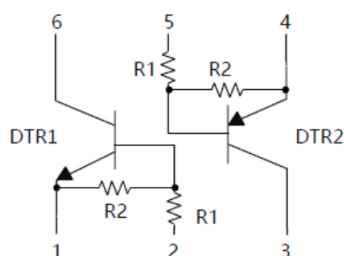


Dual NPN+PNP Digital Transistors (Built-in Resistors)



Features

- Moisture sensitivity level 1
- Halogen free and RoHS compliant
- Surface mount package ideally suited for automatic Insertion

Application

- Signal amplification
- Switching circuit

Mechanical data

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

■ Maximum Ratings ($T_a=25^{\circ}\text{C}$ Unless otherwise specified)

DTR1-NPN

Item	Symbol	Unit	Conditions	Value
Device marking code				D16
Collector-base voltage	V_{CC}	V		50
Collector-emitter voltage	V_{IN}	V		-10 to +40
Collector current	I_o	mA		100
Power dissipation	P_D	mW		150
Operation junction temperature	T_J	$^{\circ}\text{C}$		-55 to +150
Storage temperature	T_{STG}	$^{\circ}\text{C}$		-55 to +150

DTR2-PNP

Item	Symbol	Unit	Conditions	Value
Collector-base voltage	V_{CC}	V		-50
Collector-emitter voltage	V_{IN}	V		-40 to +10
Collector current	I_o	mA		-100
Power dissipation	P_D	mW		150
Operation junction temperature	T_J	$^{\circ}\text{C}$		-55 to +150
Storage temperature	T_{STG}	$^{\circ}\text{C}$		-55 to +150



UMD16NS

RoHS
COMPLIANT

■ Electrical Characteristics (T_a=25°C Unless otherwise specified)

DTR1-NPN

Item	Symbol	Unit	Conditions	Min	Typ	Max
Input voltage	V _{I(off)}	V	V _{CC} =5V, I _O =100μA	0.4		
	V _{I(on)}	V	V _O =0.3V, I _O =2mA			2.5
Output voltage	V _{O(on)}	V	I _O / I _I =10mA/0.5 mA			0.3
Input current	I _I	μA	V _I =5V			360
Output current	I _{O(off)}	μA	V _{CC} =50V, V _I =0			0.1
DC current gain	G _I		V _O =5V, I _O =5mA	56		
Input resistance	R _I	kΩ		15.4	22	28.6
Resistance ratio	R ₂ /R ₁			1.7	2.1	2.6
Transition frequency	f _T	MHz	V _O =10V, I _O =5mA, f=100MHz		250	

DTR2-PNP

Item	Symbol	Unit	Conditions	Min	Typ	Max
Input voltage	V _{I(off)}	V	V _{CC} =-5V, I _O =-100μA	-0.4		
	V _{I(on)}	V	V _O =-0.3V, I _O =-2mA			-2.5
Output voltage	V _{O(on)}	V	I _O / I _I =-10mA/-0.5 mA			-0.3
Input current	I _I	μA	V _I =-5V			-360
Output current	I _{O(off)}	μA	V _{CC} =-50V, V _I =0			-0.1
DC current gain	G _I		V _O =-5V, I _O =-5mA	56		
Input resistance	R _I	kΩ		15.4	22	28.6
Resistance ratio	R ₂ /R ₁			1.7	2.1	2.6
Transition frequency	f _T	MHz	V _O =-10V, I _O =-5mA, f=100MHz		250	

■ Thermal Characteristics

Parameter	Symbol	Unit	Value
Thermal resistance, junction-to-ambient	R _{θJ-A} ⁽¹⁾	°C/W	834
Thermal resistance, junction-to-case	R _{θJ-C} ⁽¹⁾	°C/W	667

Note:

(1) Device mounted on PCB, single-sided copper, with standard footprint

■ Ordering Information

Preferred P/N	Package code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
UMD16NS	F2	Approximate 0.009	3000	30000	120000	7" reel
UMD16NS	F3	Approximate 0.009	10000	/	210000	7" reel



■ Characteristics(Typical)

DTR1-NPN

Fig 1: Input Voltage (On) Characteristics

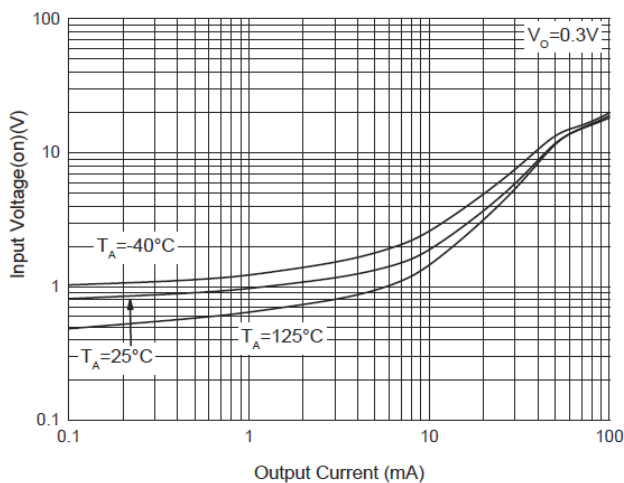


Fig 2: Input Voltage (Off) Characteristic

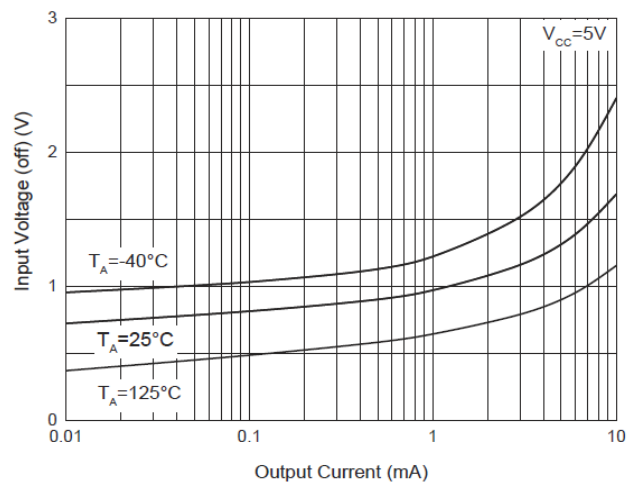


Fig 3: DC Current Gain Characteristics

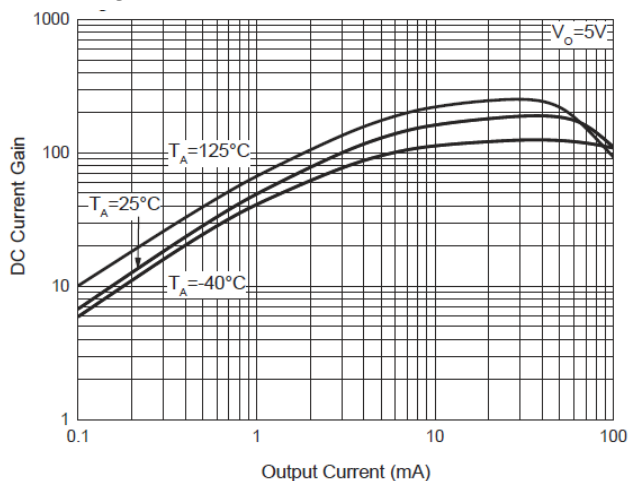


Fig 4: Output Voltage Characteristics

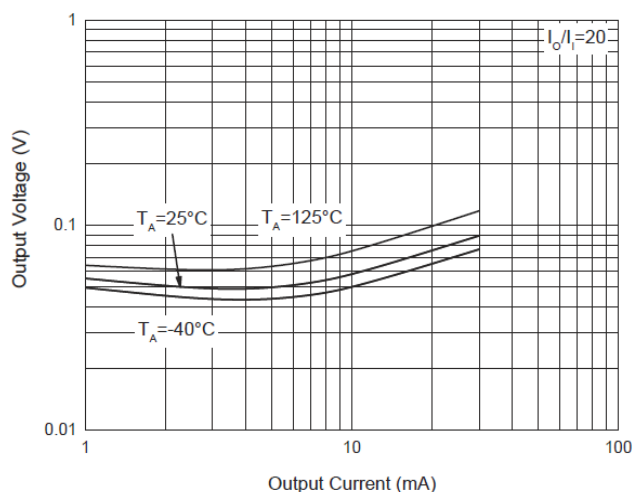
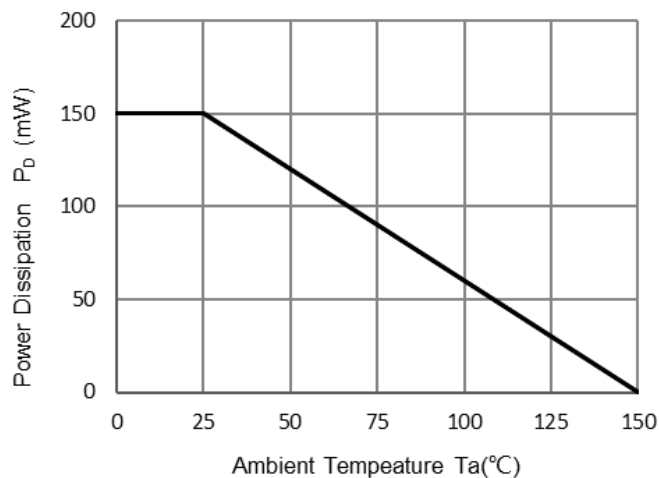


Fig 5: P_D-Ta Curve





DTR2-PNP (Typical)

Fig 5: Input Voltage (On) Characteristics

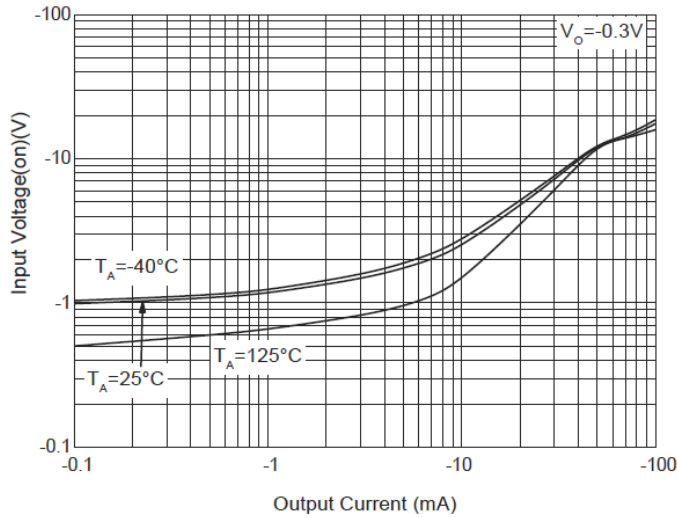


Fig 6: Input Voltage (Off) Characteristic

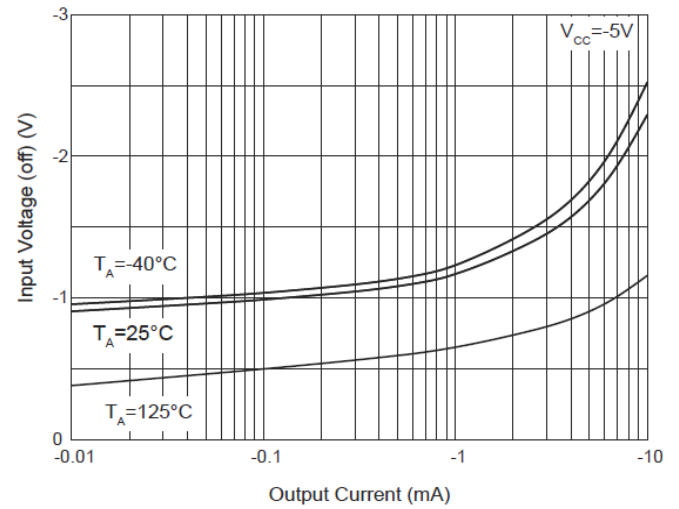


Fig 7: DC Current Gain Characteristics

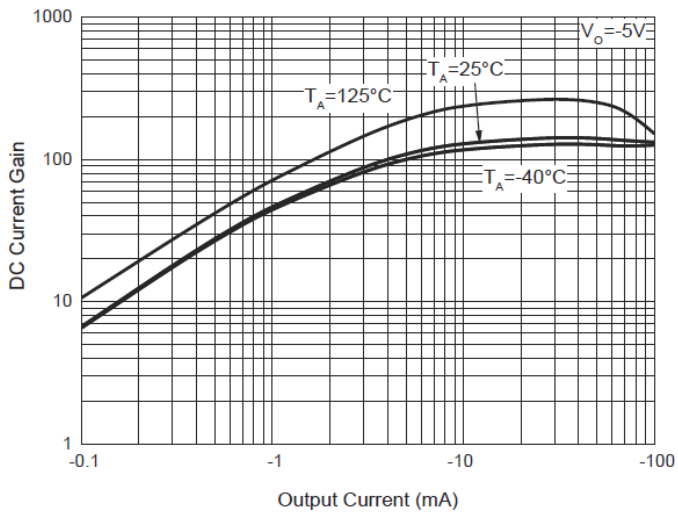


Fig 8: Output Voltage Characteristics

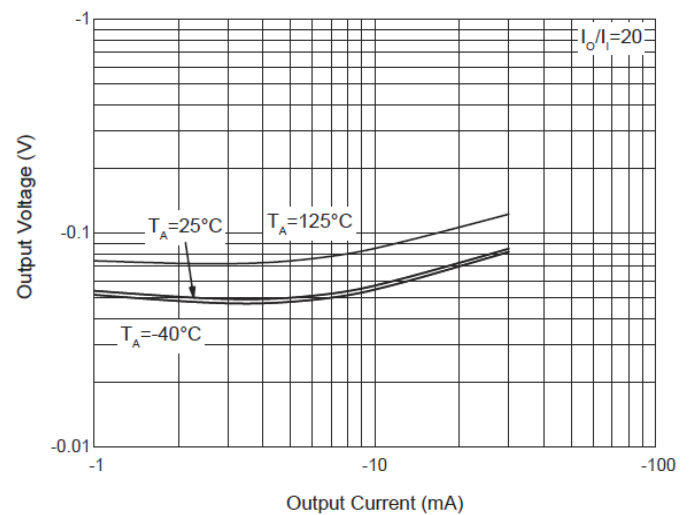
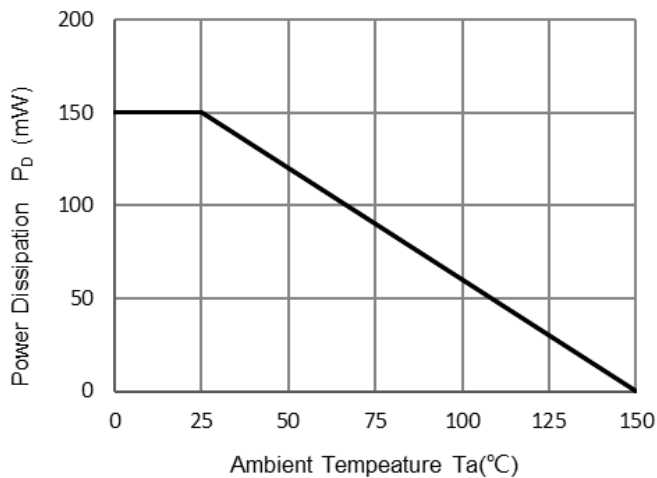
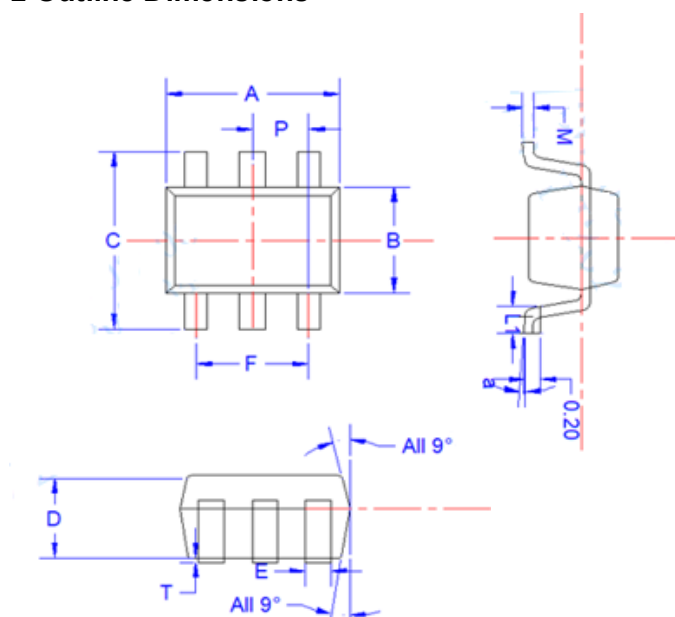


Fig 5: P_D - T_a Curve



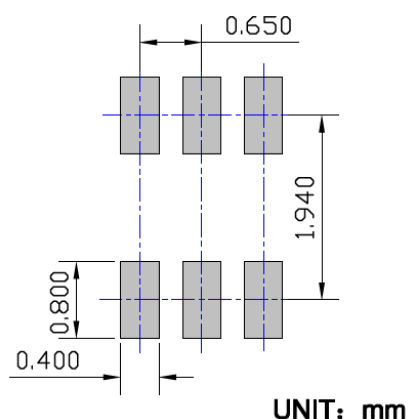


■ Outline Dimensions



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
E	0.15	0.25	0.35
B	1.15	1.25	1.35
C	2.00	2.10	2.20
P	0.650BSC		
A	1.80	2.00	2.20
T	0.00	0.05	0.100
D	0.90	0.95	1.00
L1	0.20	0.30	0.40
a	4°±4°		
M	0.10	0.15	0.25

■ Suggested Pad Layout



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