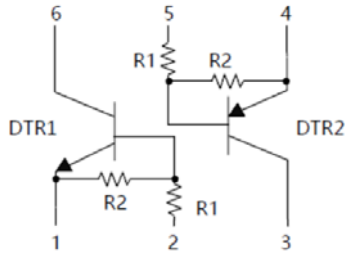
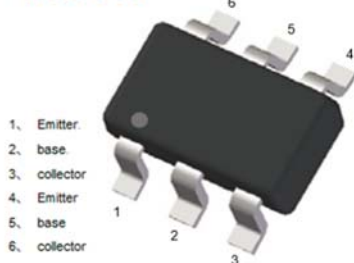


Dual NPN+PNP Digital Transistors (Built-in Resistors)



SOT-363



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-363
- **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



UMD16N

RoHS
COMPLIANT

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	°C		-55 to +150
Storage temperature	T_{STG}	°C		-55 to +150



■ 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 =100uA	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	uA	V _i =5V			120
Output current	I _{O(off)}	uA	V _{CC} =50V, V _i =0			0.1
DC current gain	G _i		V _O =5V, I _o =5mA	56		
Input resistance	R ₁	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 =-100uA	-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	A	V _i =-5V			-120
Output current	I _{O(off)}	uA	V _{CC} =-50V, V _i =0			-0.1
DC current gain	G _i		V _O =-5V, I _o =-5mA	56		
Input resistance	R ₁	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

■ Characteristics

DTR1-NPN

Fig 1: Input Voltage (On) Characteristics

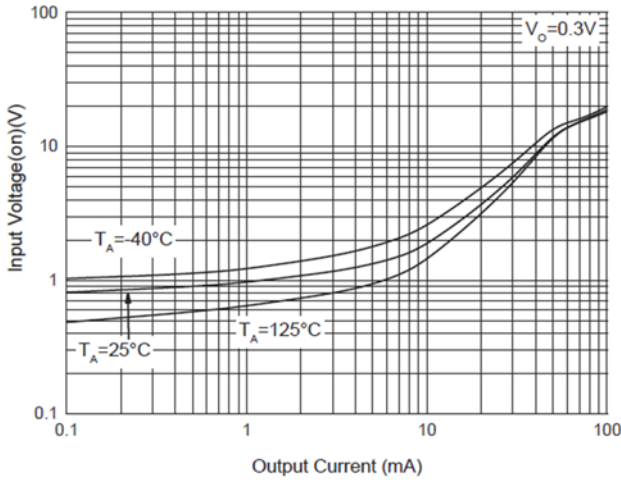


Fig 2: Input Voltage (Off) Characteristic

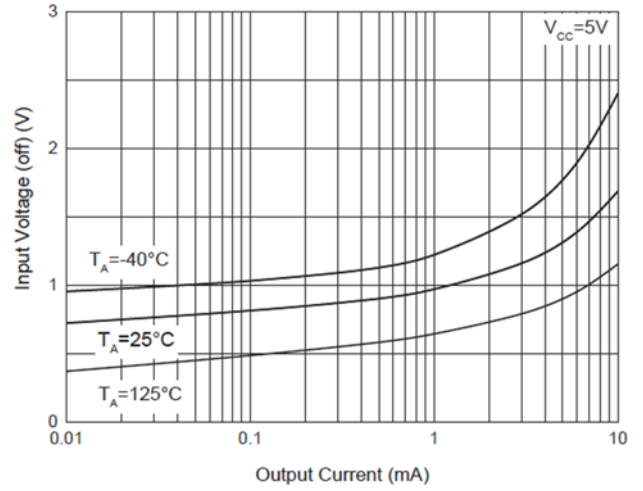


Fig 3: DC Current Gain Characteristics

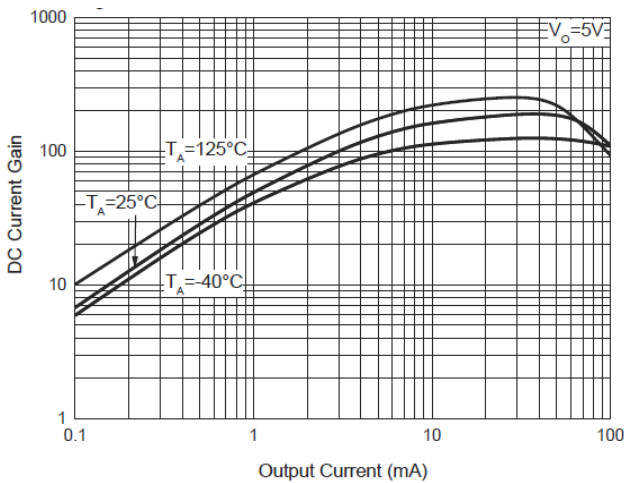


Fig 4: Output Voltage Characteristics

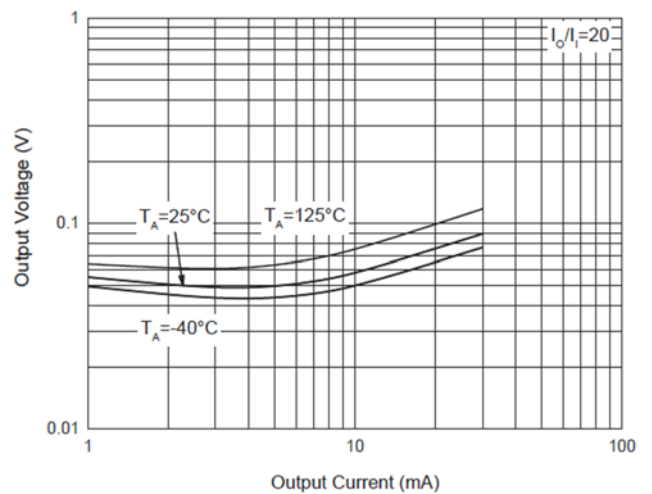
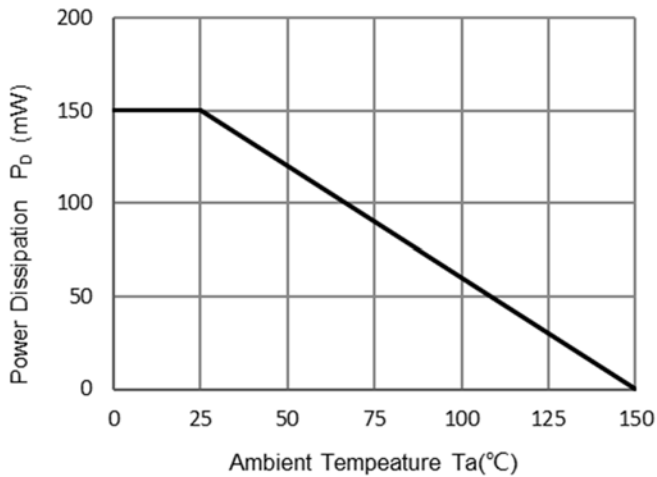


Fig 5: P_D-T_a Curve





DTR2-PNP

Fig 5: Input Voltage (On) Characteristics

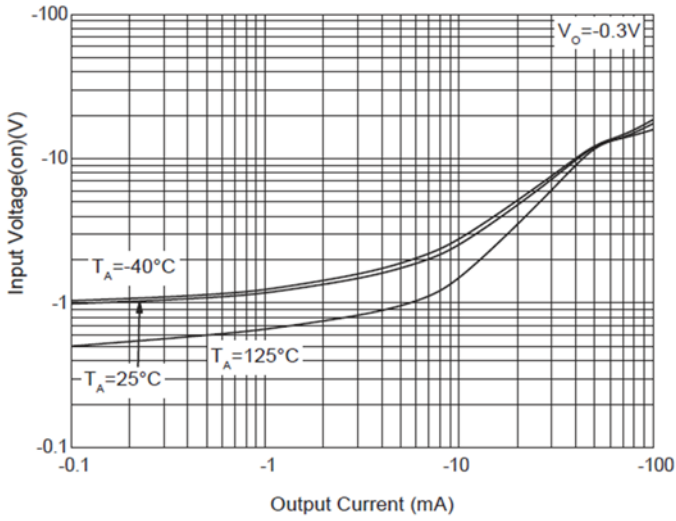


Fig 6: Input Voltage (Off) Characteristic

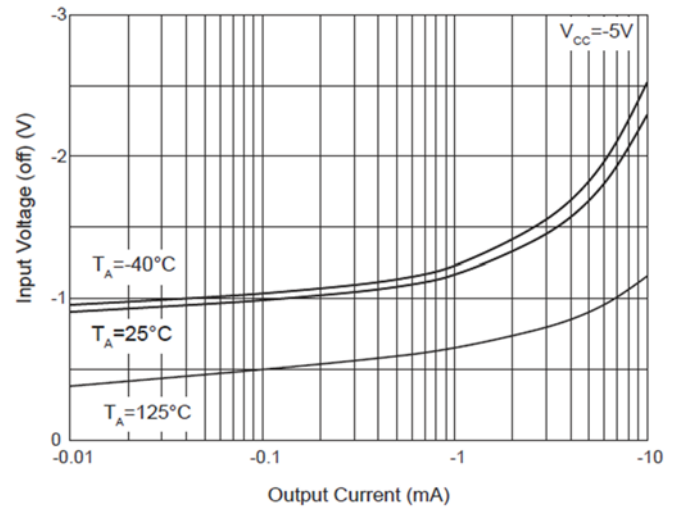


Fig 7: DC Current Gain Characteristics

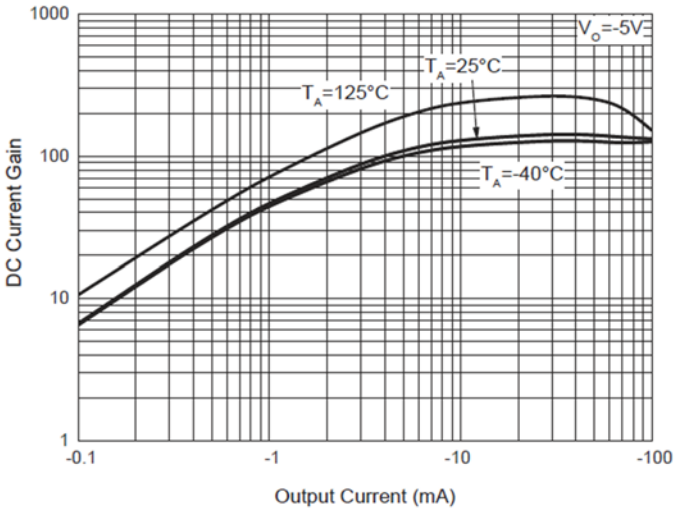


Fig 8: Output Voltage Characteristics

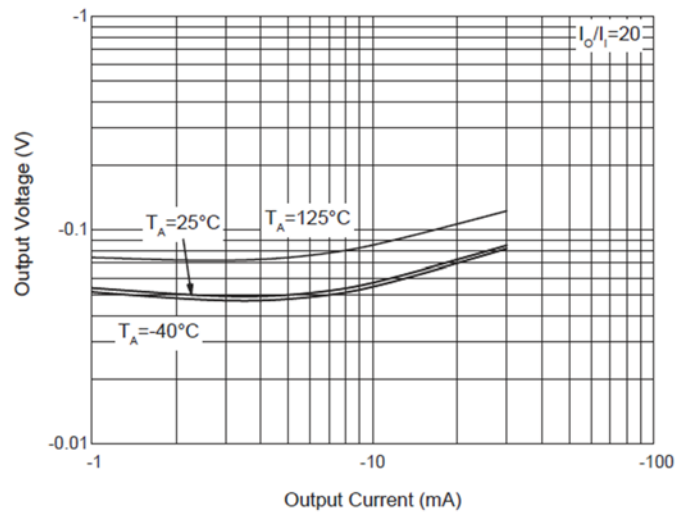
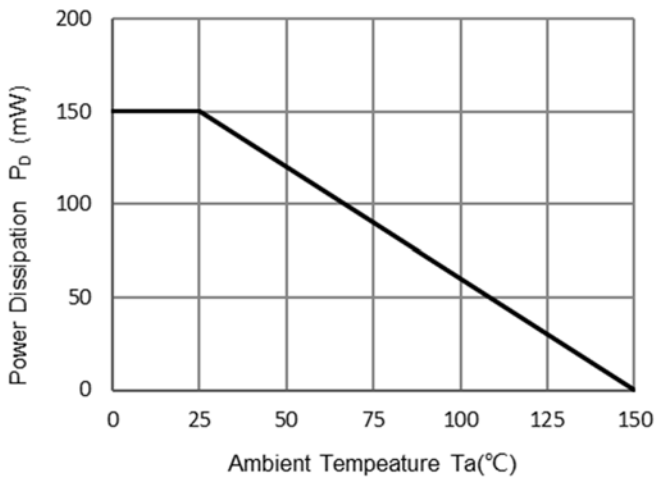


Fig 5: P_D-T_a Curve





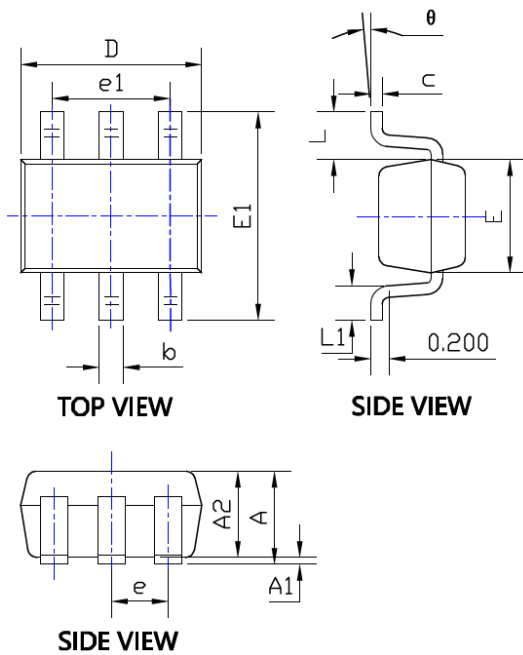
UMD16N

RoHS
COMPLIANT

■ Ordering Information

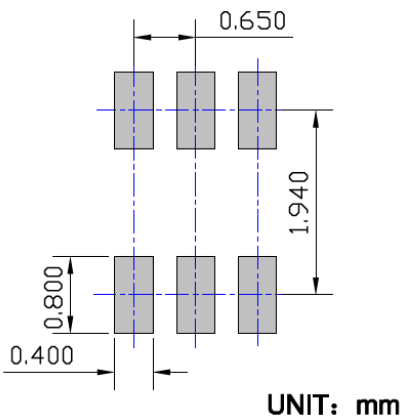
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
UMD16N	F2	Approximate 0.009	3000	30000	120000	7" reel
UMD16N	F3	Approximate 0.009	10000	/	210000	7" reel

■ Outline Dimensions



DIMENSIONS				
SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.043	0.900	1.100
A1	0.000	0.004	0.000	0.100
A2	0.035	0.039	0.900	1.000
b	0.006	0.014	0.150	0.350
c	0.004	0.010	0.100	0.250
D	0.071	0.087	1.800	2.200
E	0.045	0.053	1.150	1.350
E1	0.085	0.096	2.150	2.450
e	0.026TYP		0.650TYP	
e1	0.047	0.055	1.200	1.400
L	0.021REF		0.525REF	
L1	0.010	0.018	0.260	0.460
θ	0°	8°	0°	8°

■ Suggested Pad Layout





Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function, or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website [http:// www.21yangjie.com](http://www.21yangjie.com) , or consult your nearest Yangjie's sales office for further assistance.