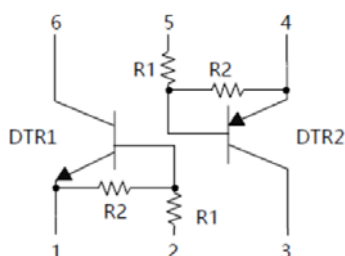


Dual NPN+PNP Digital Transistors (Built-in Resistors)



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
- **Marking code:** D20

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

DTR1-NPN

Item	Symbol	Unit	Conditions	Value
Collector-base voltage	V_{CC}	V		50
Collector-emitter voltage	V_{IN}	V		-10 to +12
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		-12 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



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■ 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	0.5		
	V _{I(on)}	V	V _O =0.3V, I _O =20mA			3.0
Output voltage	V _{O(on)}	V	I _O / I _I = 10mA/0.5 mA			0.3
Output current	I _{O(off)}	uA	V _{CC} =50V, V _I =0			0.5
DC current gain	G _I		V _O =5V, I _O =10mA	20		
Input resistance	R ₁	kΩ		1.54	2.2	2.86
Resistance ratio	R ₂ /R ₁			0.8	1	1.2
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			-0.5
	V _{I(on)}	V	V _O =-0.3V, I _O =-2mA	-3.0		
Output voltage	V _{O(on)}	V	I _O / I _I = -10mA/-0.5 mA			-0.3
Output current	I _{O(off)}	uA	V _{CC} =-50V, V _I =0			-0.5
DC current gain	G _I		V _O =-5V, I _O =-20mA	20		
Input resistance	R ₁	kΩ		1.54	2.2	2.86
Resistance ratio	R ₂ /R ₁			0.8	1	1.2
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	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
UMD20N	F2	Approximate 0.009	3000	30000	120000	7" reel
UMD20N	F3	Approximate 0.009	10000	/	210000	7" reel



■Curve Characteristics (Typical)

DTr1-NPN:

Fig. 1 - DC Current Gain Characteristics

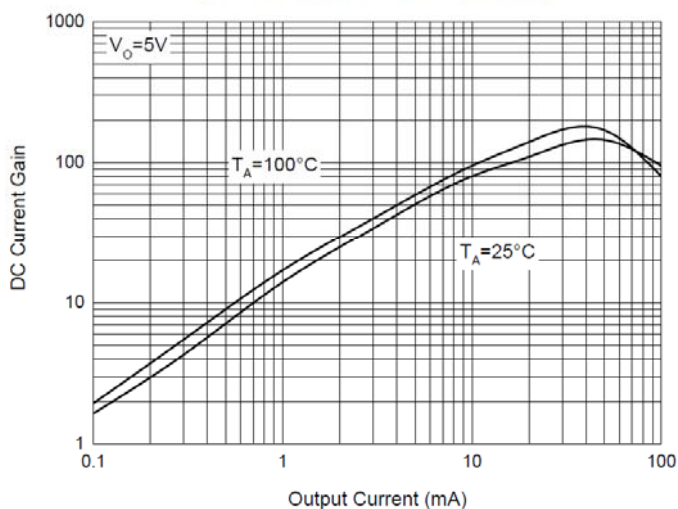


Fig. 2 - Input Voltage (on) Characteristics

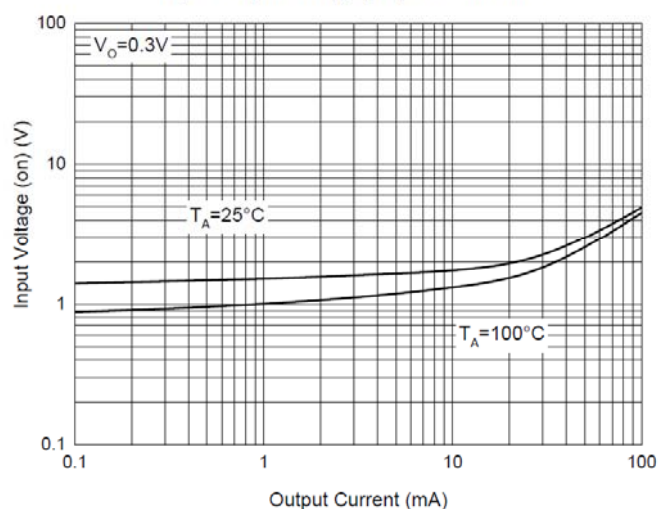


Fig. 3 - Input Voltage (off) Characteristics

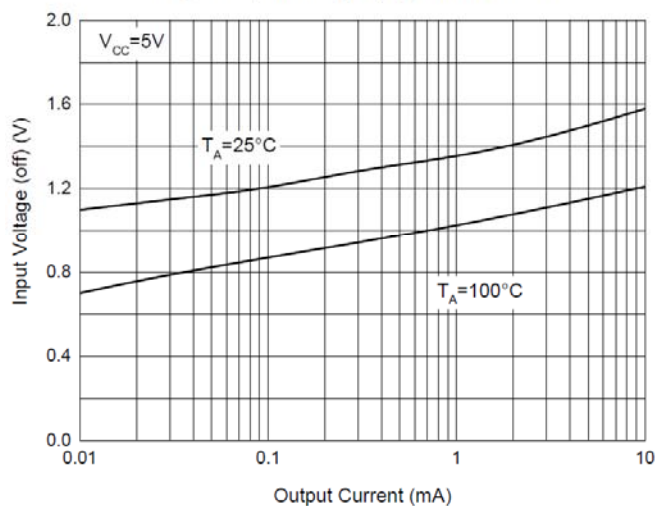


Fig. 4 - Output Voltage Characteristics

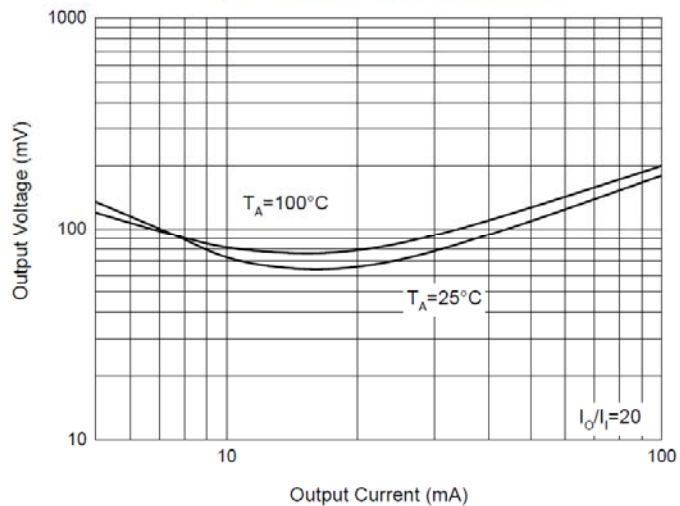
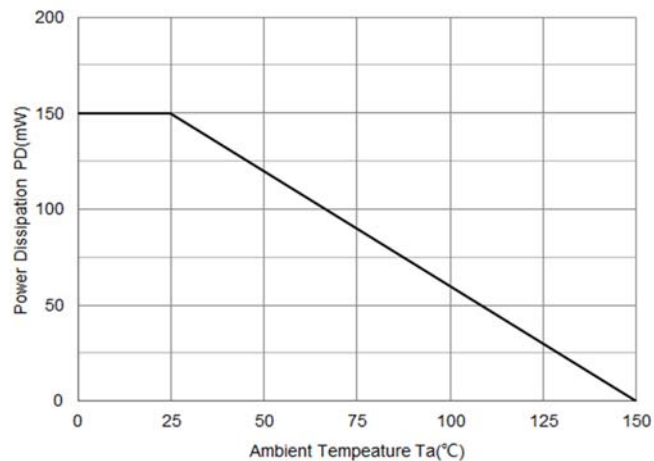


Fig5. P_D ----- T_A





■Curve Characteristics (Typical)

DTr2-PNP:

Fig. 1 - DC Current Gain Characteristics

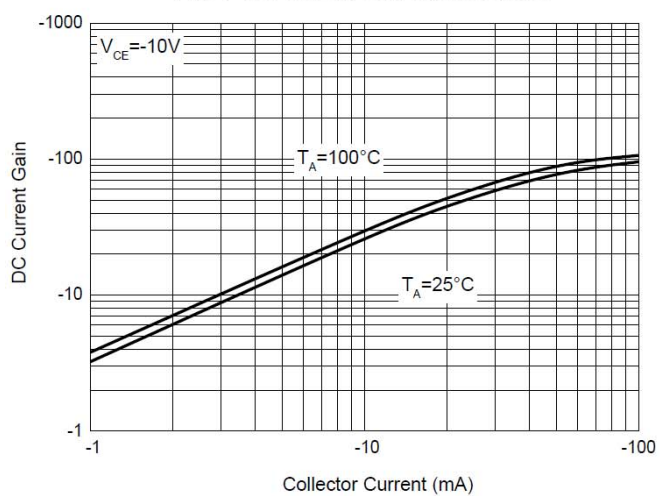


Fig. 2 - Collector-Emitter Saturation Voltage Characteristics

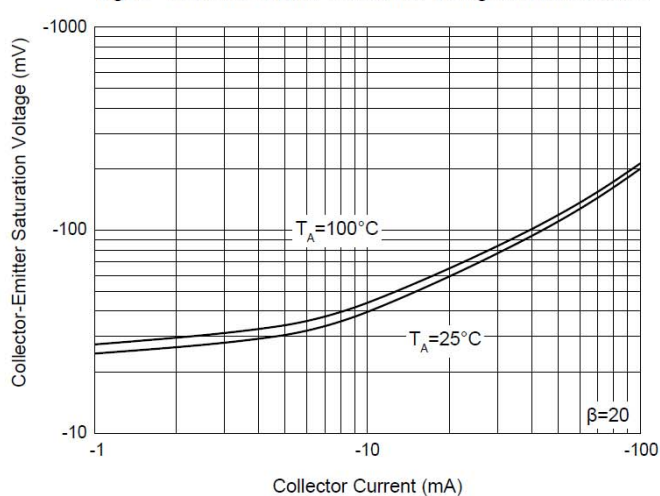
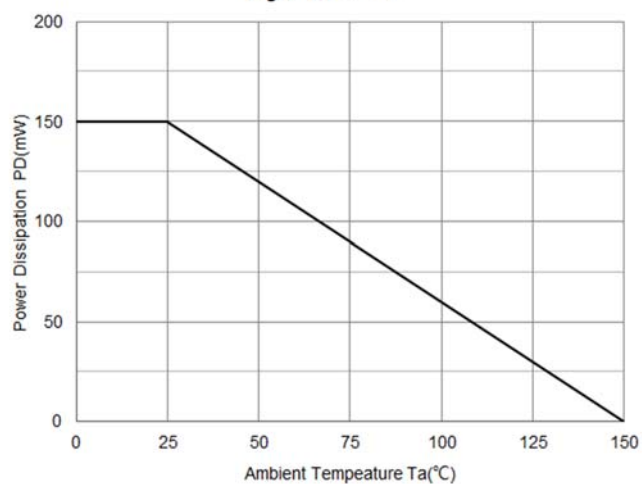


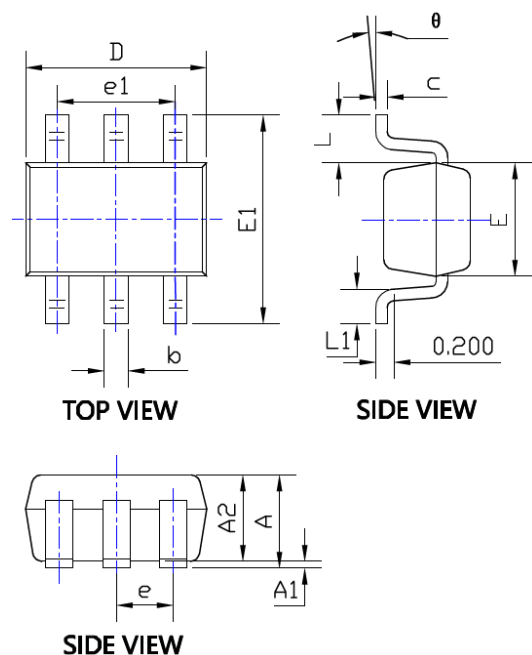
Fig5. P_D ----- T_A





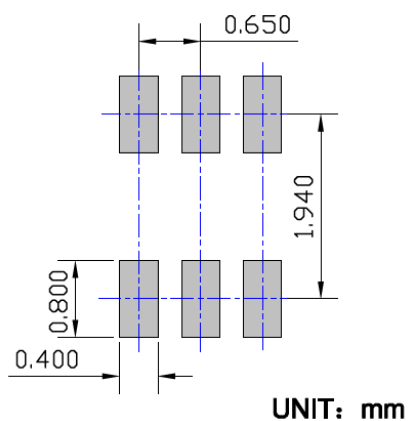
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■ Outline Dimensions



SYMBOL	DIMENSIONS			
	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





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