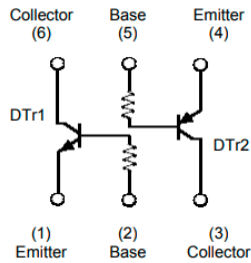
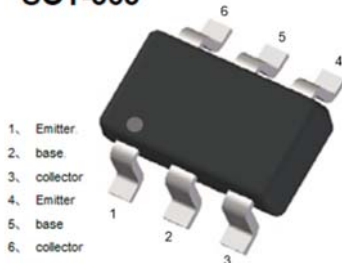


## Dual NPN+PNP Digital Transistors (Built-in Resistors)



**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				D6
Collector-base voltage	$V_{CBO}$	V	$I_C=50\mu\text{A}$	50
Collector-emitter voltage	$V_{CEO}$	V	$I_C=1\text{mA}$	50
Emitter-base voltage	$V_{EBO}$	V	$I_E=50\mu\text{A}$	5
Collector current	$I_C$	mA		100
Power dissipation	$P_D$	mW		150
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	$V_{CBO}$	V	$I_C = -50\mu A$	-50
Collector-emitter voltage	$V_{CEO}$	V	$I_C = -1mA$	-50
Emitter-base voltage	$V_{EBO}$	V	$I_E = -50\mu A$	-5
Collector current	$I_C$	mA		-100
Junction temperature	$T_J$	°C		-55 to +150
Storage temperature	$T_{STG}$	°C		-55 to +150

**■ Electrical Characteristics** ( $T_a = 25^\circ C$  Unless otherwise specified)**DTR1-NPN**

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	$I_C = 50\mu A$	50		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	$I_C = 1mA$	50		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	$I_E = 50\mu A$	5		
Collector-base cut-off current	$I_{CBO}$	$\mu A$	$V_{CB} = 50V$			0.5
Emitter-base cut-off current	$I_{EBO}$	$\mu A$	$V_{EB} = 4V$			0.5
DC current gain	$h_{FE}$		$V_{CE} = 5V, I_C = 1mA$	100		600
Input resistance	$R_1$	k $\Omega$		3.29	4.7	6.11
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C = 10mA, I_B = 0.5mA$			0.3
Transition frequency	$f_T$	MHz	$V_{CE} = 10V, I_E = -5mA, f = 100MHz$		250	



## DTR2-PNP

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	$I_C = -50\mu A$	-50		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	$I_C = -1mA$	-50		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	$I_E = -50\mu A$	-5		
Collector-base cut-off current	$I_{CBO}$	$\mu A$	$V_{CB} = -50V$			-0.5
Emitter-base cut-off current	$I_{EBO}$	$\mu A$	$V_{EB} = -4V$			-0.5
DC current gain	$h_{FE}$		$V_{CE} = -5V, I_C = -1mA$	100		600
Input resistance	$R_1$	$k\Omega$		3.29	4.7	6.11
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C = -10mA, I_B = -0.5mA$			-0.3
Transition frequency	$f_T$	MHz	$V_{CE} = 10V, I_E = -5mA, f = 100MHz$		250	

## ■ Thermal Characteristics

Parameter	Symbol	Unit	Value
Thermal resistance, junction-to-ambient	$R_{\theta J-A}^{(1)}$	$^{\circ}C/W$	830
Thermal resistance, junction-to-case	$R_{\theta J-C}^{(1)}$	$^{\circ}C/W$	664

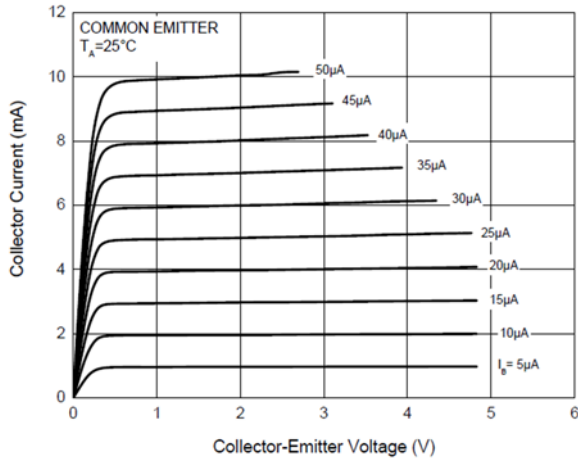
## Note:

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

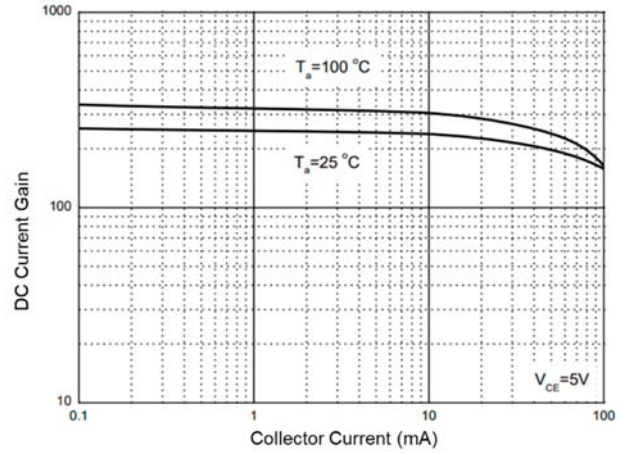
## ■ Characteristics

### DTR1-NPN

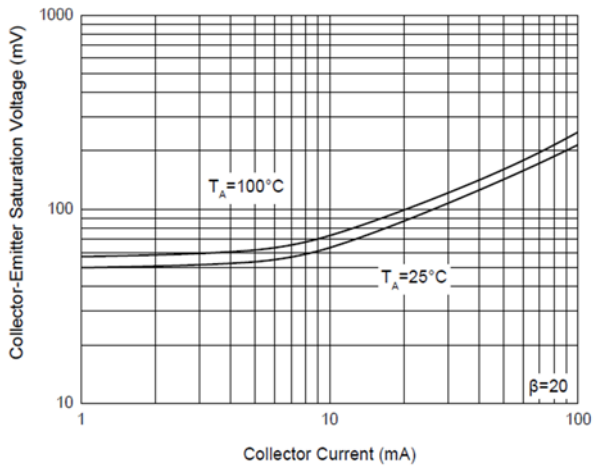
**Fig 1: Static Characteristics**



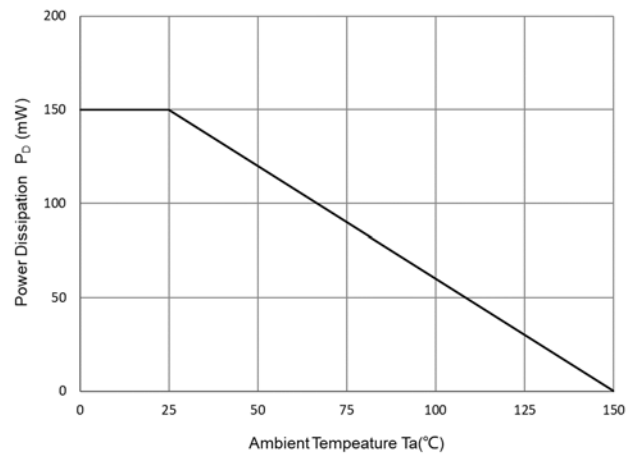
**Fig 2: DC Current Gain Characteristics**



**Fig 3: Collector-Emitter Saturation Voltage**



**Fig 4:  $P_D$ - $T_a$  Curve**





DTR2-PNP

Fig 4: Static Characteristics

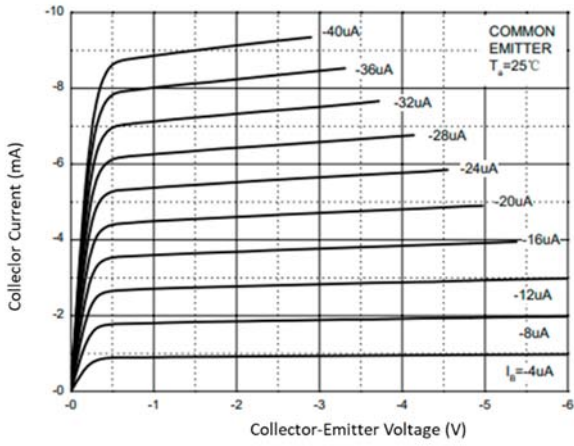


Fig 5: DC Current Gain Characteristics

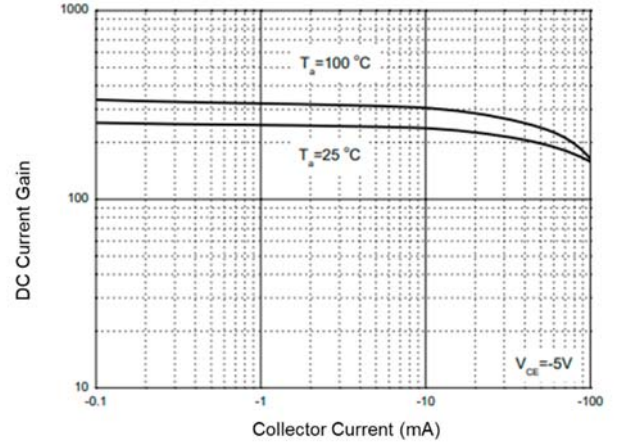
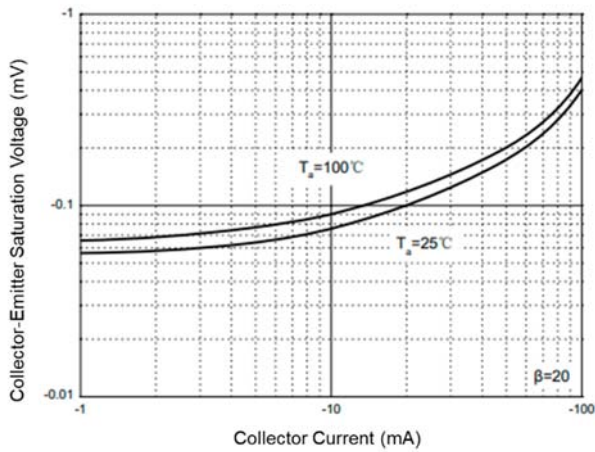


Fig 6: Collector-Emitter Saturation Voltage





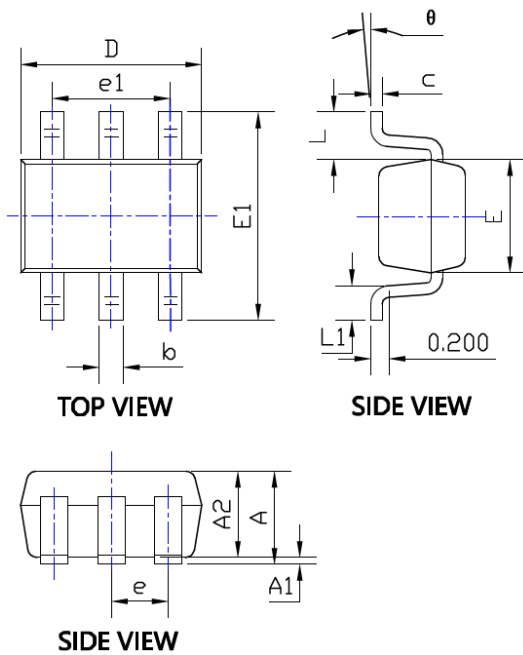
# UMD6N

RoHS  
COMPLIANT

## ■ Ordering Information

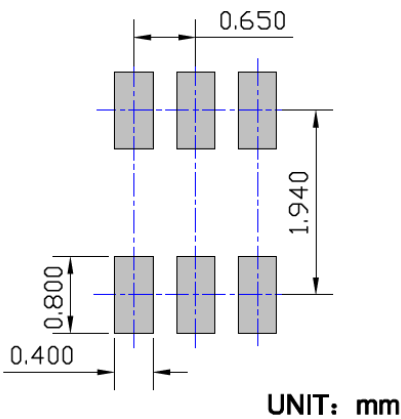
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
UMD6N	F2	Approximate 0.009	3000	30000	120000	7" reel
UMD6N	F3	Approximate 0.009	10000	/	210000	7" reel

## ■ 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
$\theta$	0°	8°	0°	8°

## ■ Suggested Pad Layout





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