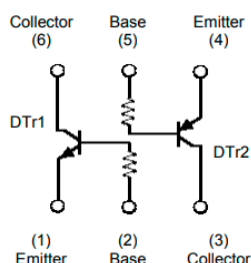


UMD6N

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



SOT-363



Features

- Moisture sensitivity level 1
- Halogen free and
- 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

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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}	μA	$V_{CB} = 50V$			0.5
Emitter-base cut-off current	I_{EBO}	μA	$V_{EB} = 4V$			0.5
DC current gain	h_{FE}		$V_{CE} = 5V, I_C = 1mA$	100		600
Input resistance	R_1	k Ω		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	

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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}	μA	$V_{CB} = -50V$			-0.5
Emitter-base cut-off current	I_{EBO}	μA	$V_{EB} = -4V$			-0.5
DC current gain	h_{FE}		$V_{CE} = -5V, I_C = -1mA$	100		600
Input resistance	R_1	k Ω		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

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■ Characteristics

DTR1-NPN

Fig 1: Static Characteristics

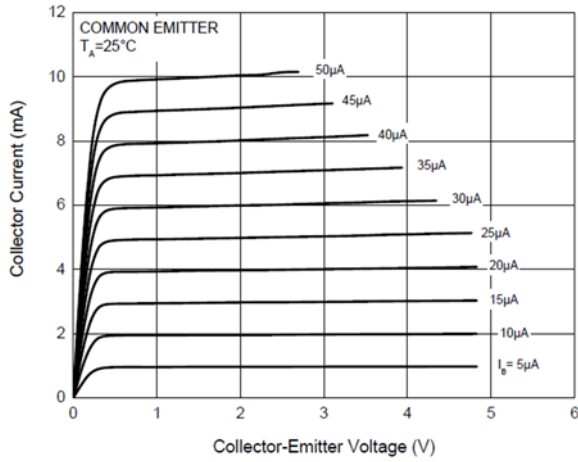


Fig 2: DC Current Gain Characteristics

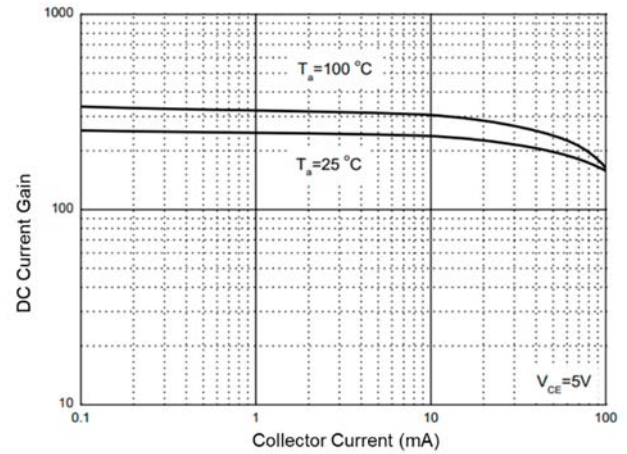


Fig 3: Collector-Emitter Saturation Voltage

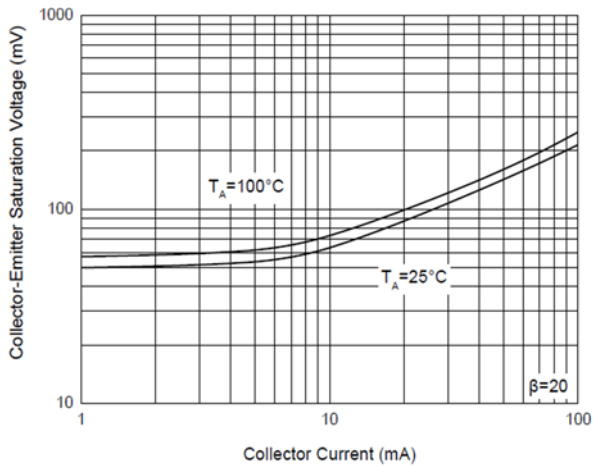
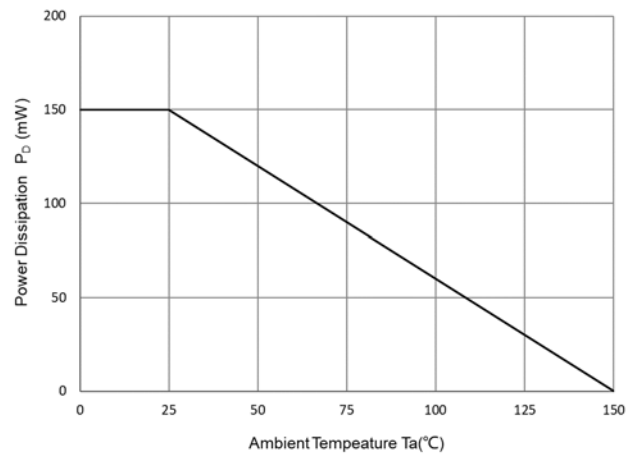


Fig 4: P_D-T_a Curve



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DTR2-PNP

Fig 4: Static Characteristics

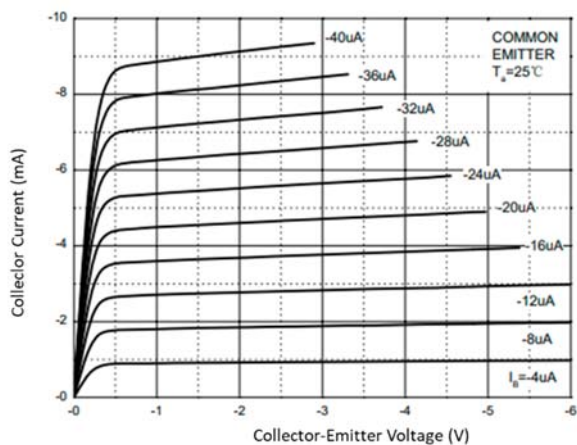


Fig 5: DC Current Gain Characteristics

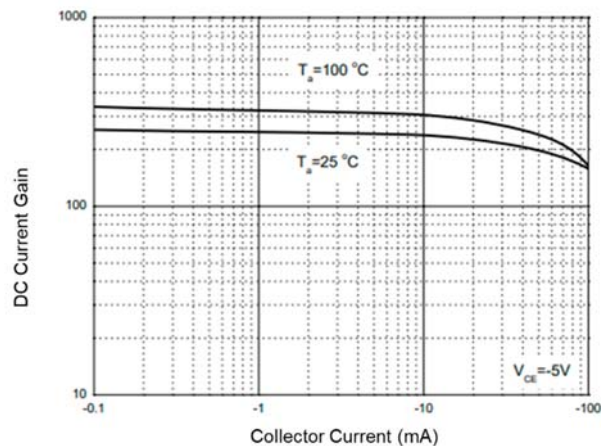
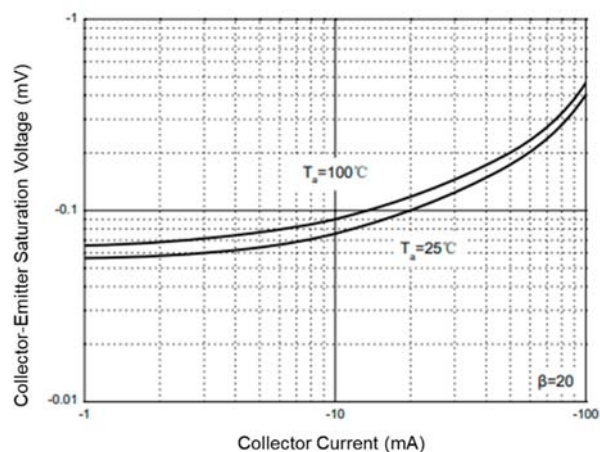


Fig 6: Collector-Emitter Saturation Voltage

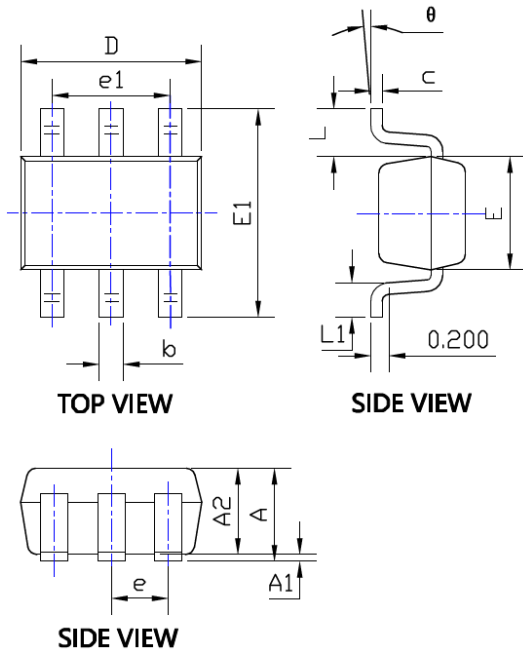


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■ Ordering Information

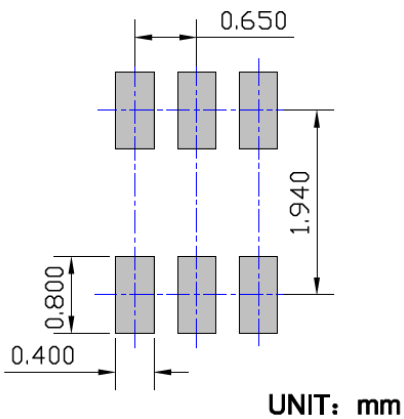
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
UMD6N	F2	Approximate 0.009	3000	30000	120000	7" reel
UMD6N	F3	Approximate 0.009	10000	/	210000	7" reel

■ Outline Dimensions



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



UMD6N

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