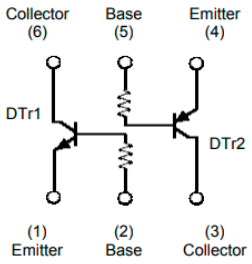
RoHS COMPLIANT

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

■ Maximum Ratings (T_a=25℃ Unless otherwise specified)

DTR1-NPN

Item	Symbol	Unit	Conditions	Value
Device marking code				D14
Collector-base voltage	V_{CBO}	V	I_C=50uA	50
Collector-emitter voltage	V_{CEO}	V	I_C=1mA	50
Emitter-base voltage	V_{EBO}	V	I_E=50uA	5
Collector current	I_C	mA		100
Power dissipation	P_D	mW		150
Junction temperature	T_J	℃		-55 to +150
Storage temperature	T_{STG}	℃		-55 to +150

DTR2-PNP

Item	Symbol	Unit	Conditions	Value
Collector-base voltage	V_{CBO}	V	I_C=-50uA	-50
Collector-emitter voltage	V_{CEO}	V	I_C=-1mA	-50
Emitter-base voltage	V_{EBO}	V	I_E=-50uA	-5
Collector current	I_C	mA		-100
Junction temperature	T_J	℃		-55 to +150
Storage temperature	T_{STG}	℃		-55 to +150

■ Electrical Characteristics (Ta=25℃ Unless otherwise specified)

DTR1-NPN

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	I_C=50uA	50		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	I_C=1mA	50		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	I_E=50uA	5		
Collector-base cut-off current	I_{CBO}	uA	V_{CB}=50V			0.5
Emitter-base cut-off current	I_{EBO}	uA	V_{EB}=4V			0.5
DC current gain	h_{FE}		V_{CE}=5V, I_C =1mA	100		600
Input resistance	R_1	kΩ		3.29	4.7	6.11
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	I_C =5mA,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=-50uA	-50		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	I_C=-1mA	-50		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	I_E=-50uA	-5		
Collector-base cut-off current	I_{CBO}	uA	V_{CB}=-50V			-0.5
Emitter-base cut-off current	I_{EBO}	uA	V_{EB}=-4V			-0.5
DC current gain	h_{FE}		V_{CE}=-5V, I_C =-1mA	100		600
Input resistance	R_1	kΩ		32.9	47	61.1
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

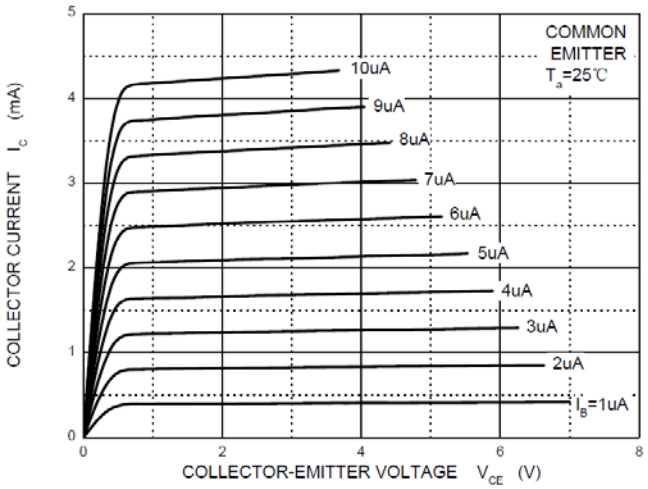
Parameter	Symbol	Unit	Value
Thermal resistance, junction-to-ambient	$R_{\theta J-A}$(1)	℃/W	830
Thermal resistance, junction-to-case	$R_{\theta J-C}$(1)	℃/W	664

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

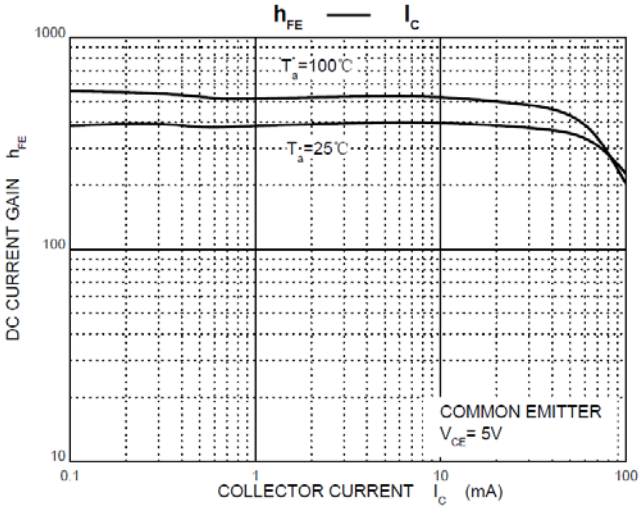
■Characteristics

DTR1-NPN

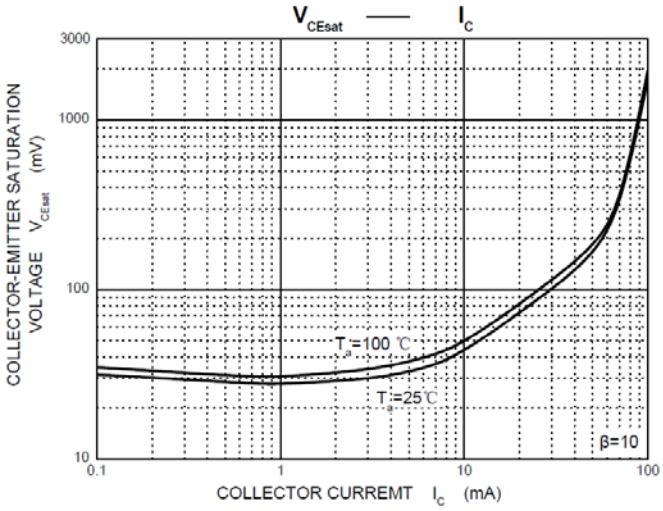
Static Characteristic



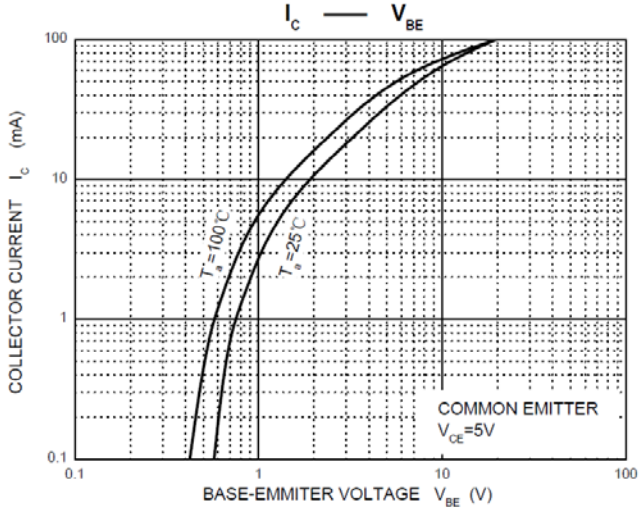
h_{FE} — I_C



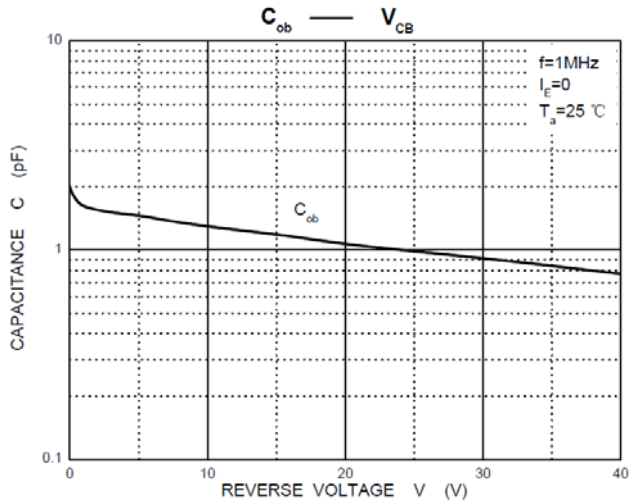
V_{CEsat} — I_C



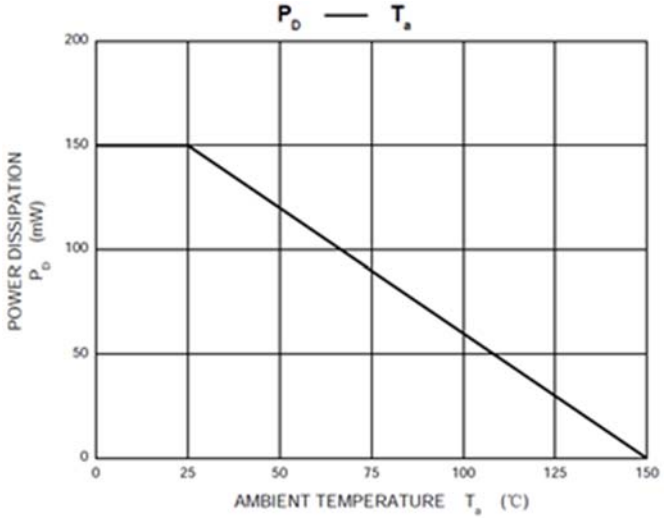
I_C — V_{BE}



C_{ob} — V_{CB}



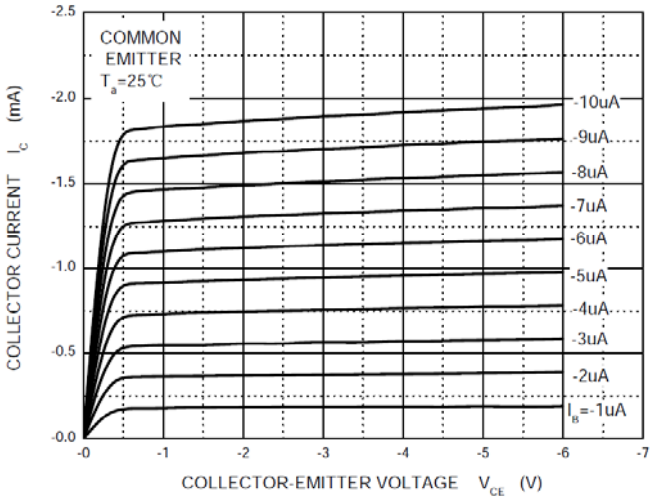
P_D — T_a



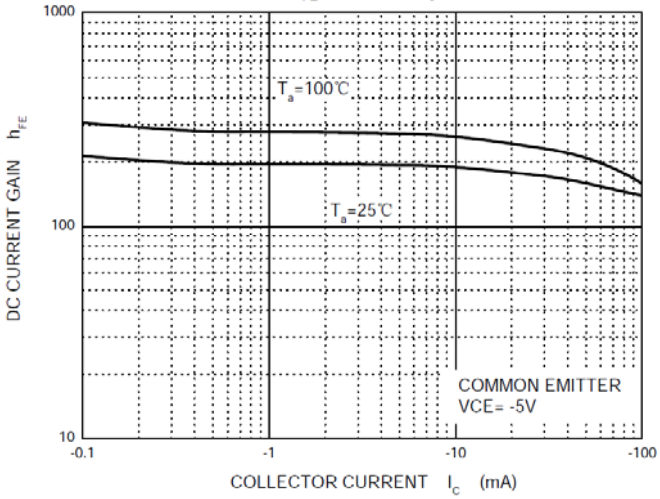
■Characteristics

DTR2-PNP

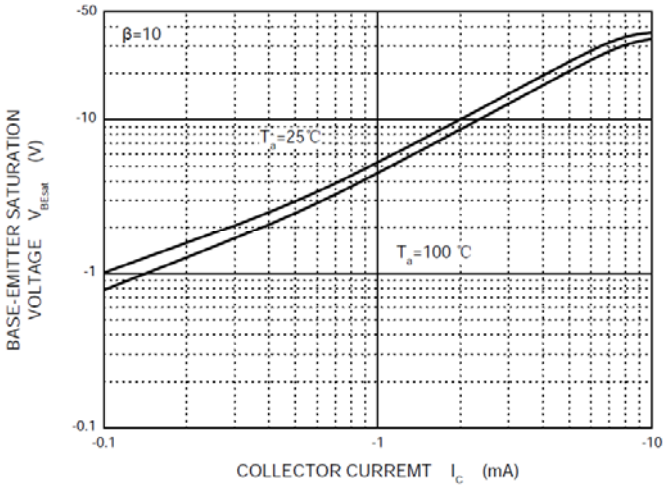
Static Characteristic



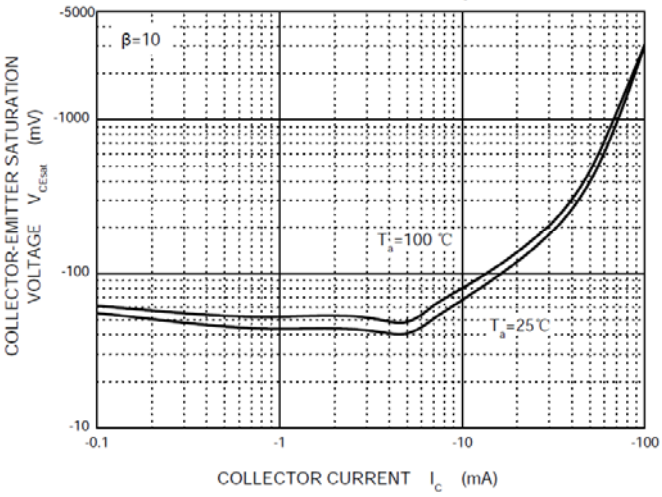
hFE — IC



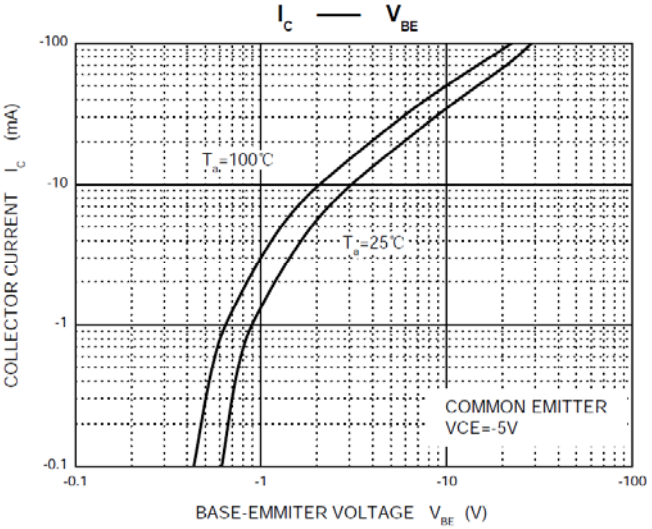
VBEsat — IC



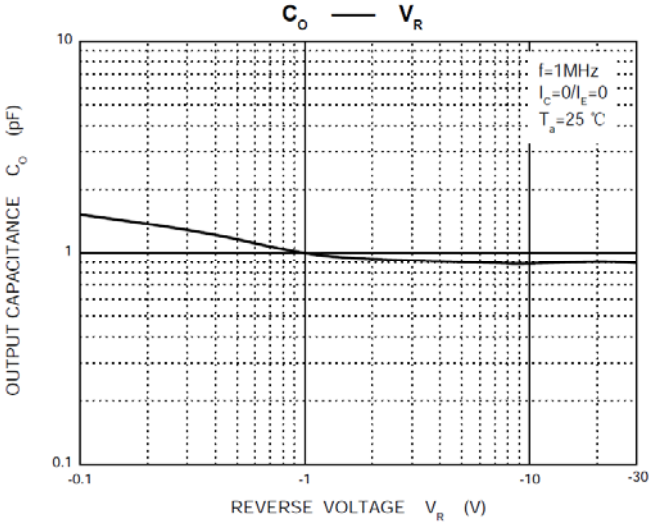
VCEsat — IC



IC — VBE



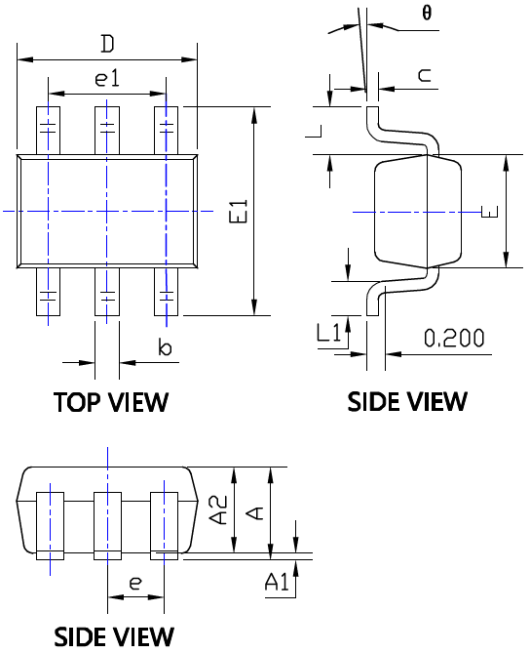
CO — VR



■Ordering Information

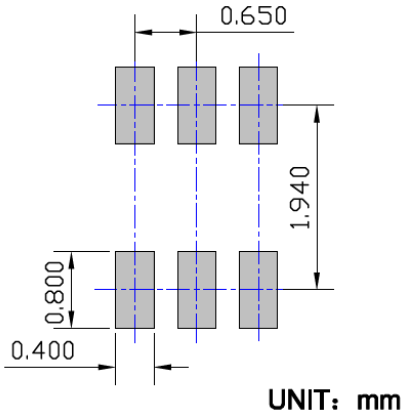
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
UMD14N	F2	Approximate 0.009	3000	30000	120000	7” reel
UMD14N	F3	Approximate 0.009	10000	/	210000	7” reel

■ 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
θ	0°	8°	0°	8°

■ Suggested Pad Layout



UNIT：mm

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