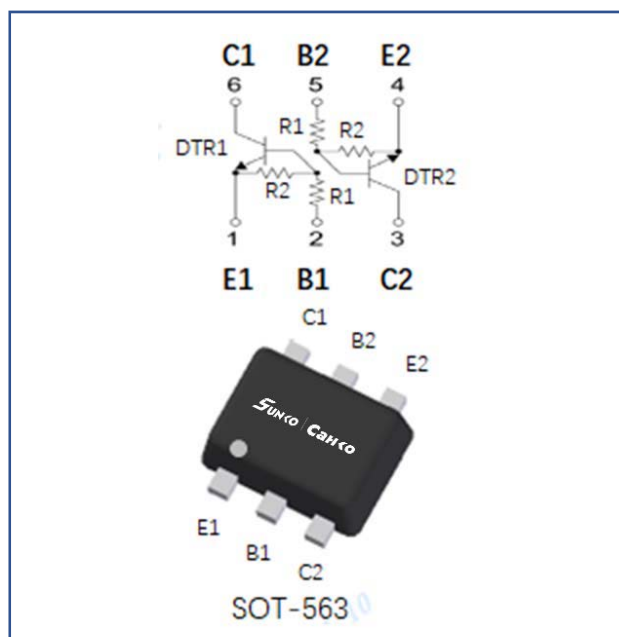


EMD9

NPN+PNP Digital Transistors (Built-in Resistors)



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-563
- **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	Value
Device marking code			D9
Supply voltage	V_{CC}	V	50
Input voltage	V_{IN}	V	-6 to +40
Output current	I_o	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

EMD9

DTR2-PNP

	Symbol	Unit	Value
Supply voltage	V_{CC}	V	-50
Input voltage	V_{IN}	V	-40 to +6
Output current	I_O	mA	-100
Power dissipation	P_D	mW	150
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	$V_{CC}=5V, I_C=100\mu A$	0.3		
	$V_{I(on)}$	V	$V_O=0.3V, I_C=1mA$			1.4
Output voltage	$V_{O(on)}$	V	$I_O / I_i = 5mA / 0.25 mA$			0.3
Input current	I_i	mA	$V_i=5V$			0.88
Output current	$I_{O(off)}$	uA	$V_{CC}=50V, V_i=0$			0.5
DC current gain	G_i		$V_O=5V, I_O = 5mA$	68		
Input resistance	R_1	kΩ		7	10	13
Resistance ratio	R_2/R_1			3.7	4.7	5.7
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
Input voltage	$V_{I(off)}$	V	$V_{CC}=-5V, I_c=-100\mu A$	-0.3		
	$V_{I(on)}$	V	$V_O=-0.3V, I_c=-1mA$			-1.4
Output voltage	$V_{O(on)}$	V	$I_O / I_i = -5mA / -0.25 mA$			-0.3
Input current	I_i	mA	$V_i=-5V$			-0.88
Output current	$I_{O(off)}$	μA	$V_{CC}=-50V, V_i=0$			-0.5
DC current gain	G_i		$V_O=-5V, I_o = -5mA$	68		
Input resistance	R_1	k Ω		7	10	13
Resistance ratio	R_2/R_1			3.7	4.7	5.7
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	$R_{\theta J-A}^{(1)}$	$^{\circ}C/W$	833
Thermal resistance, junction-to-case	$R_{\theta J-C}^{(1)}$	$^{\circ}C/W$	667

Note:

(1) Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 25.4mm*25.4mm copper pad areas

EMD9

■ Characteristics

DTR1-NPN

Fig 1: DC Current Gain Characteristics

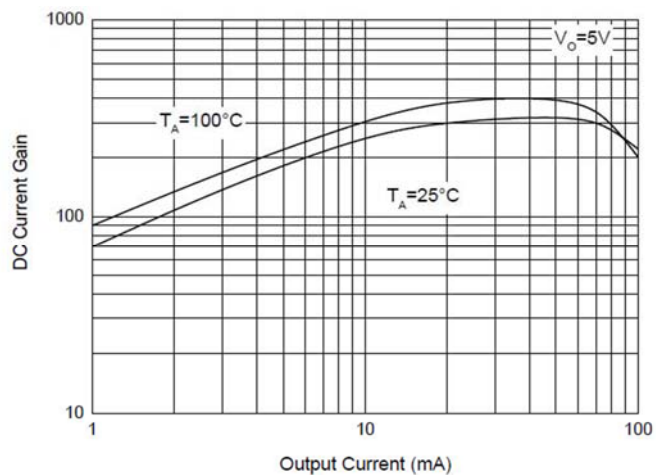


Fig 2: Input Voltage (On) Characteristics

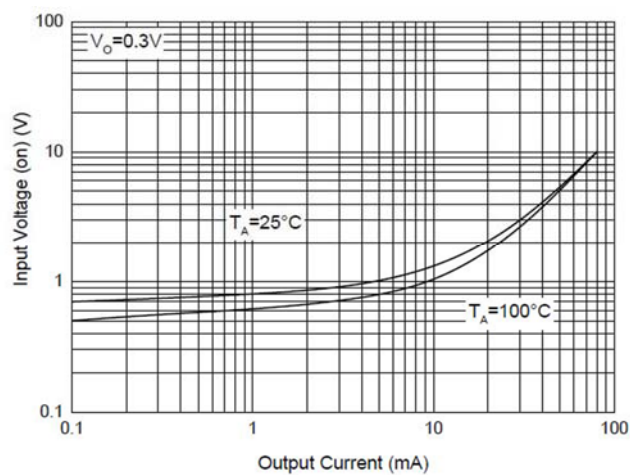


Fig 3: Input Voltage (Off) Characteristics

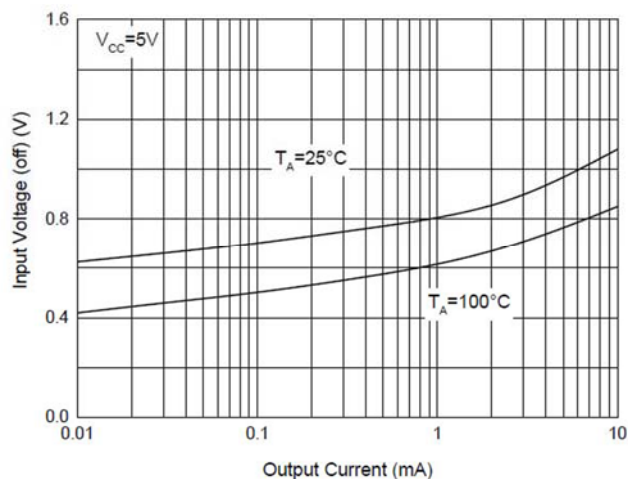


Fig 4: Output Voltage Characteristics

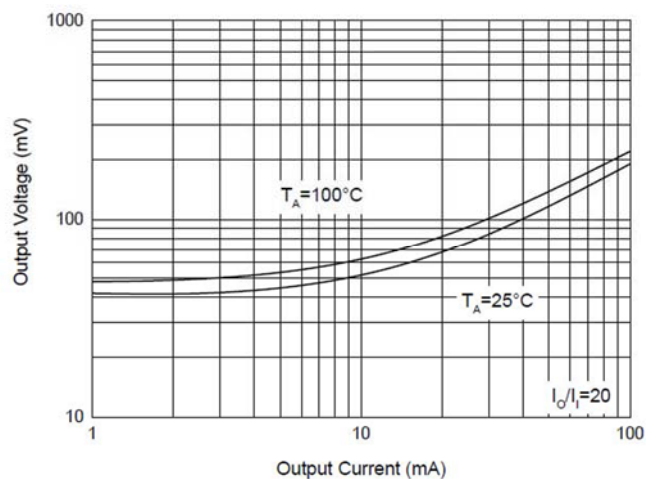
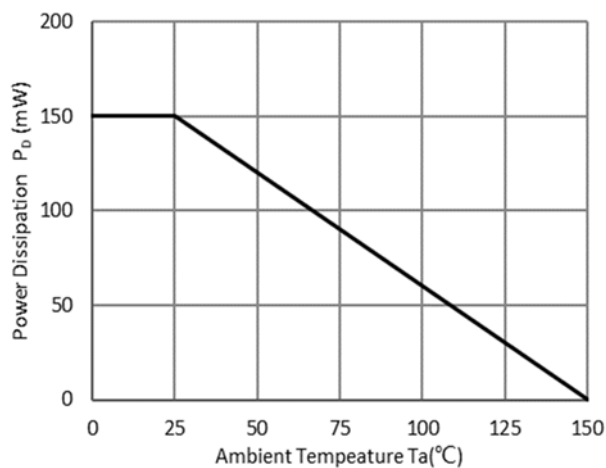


Fig 5: P_D-Ta Curve



EMD9

DTR2-PNP

Fig 1: DC Current Gain Characteristics

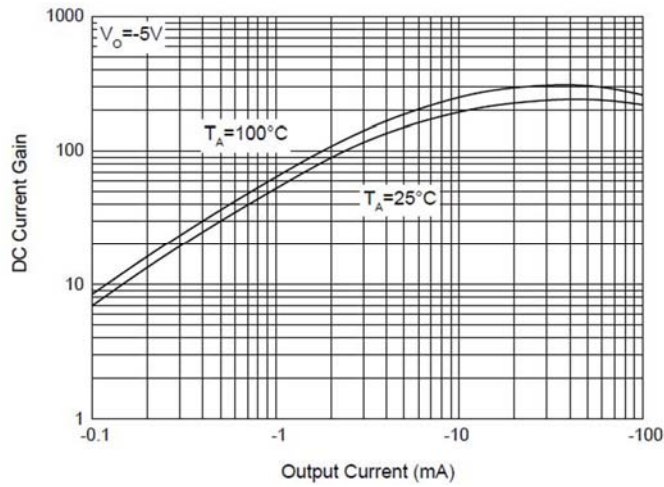


Fig 2: Input Voltage (On) Characteristics

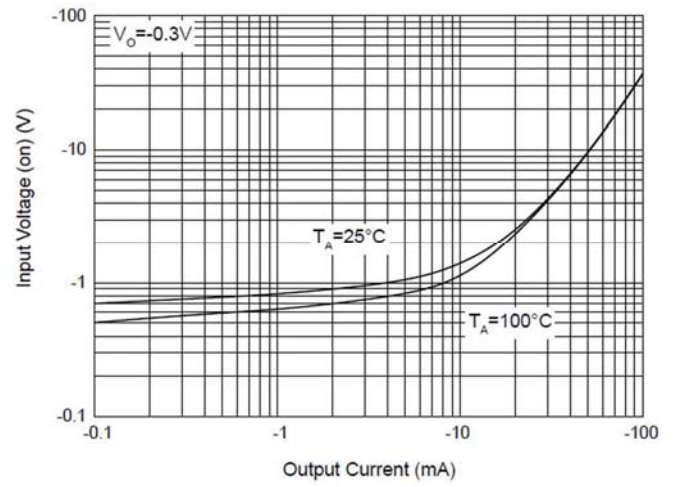


Fig 3: Input Voltage (Off) Characteristics

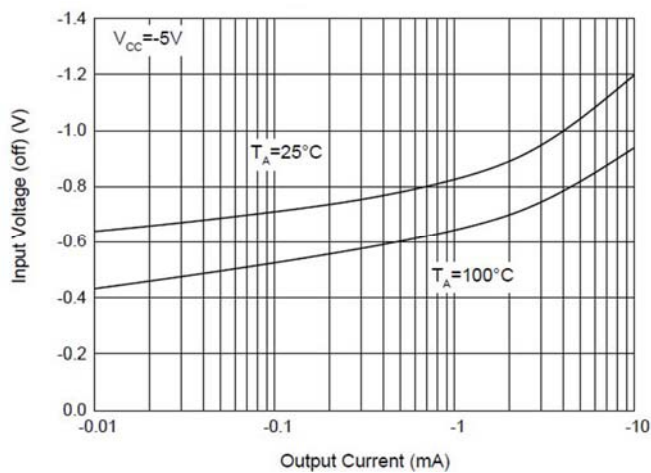


Fig 4: Output Voltage Characteristics

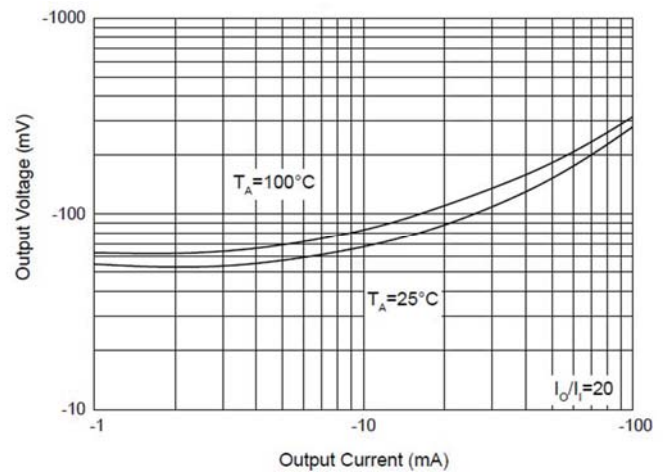
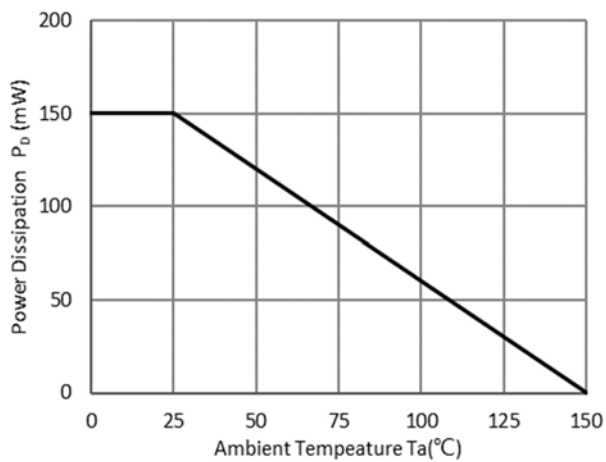


Fig 5: P_D-T_a Curve

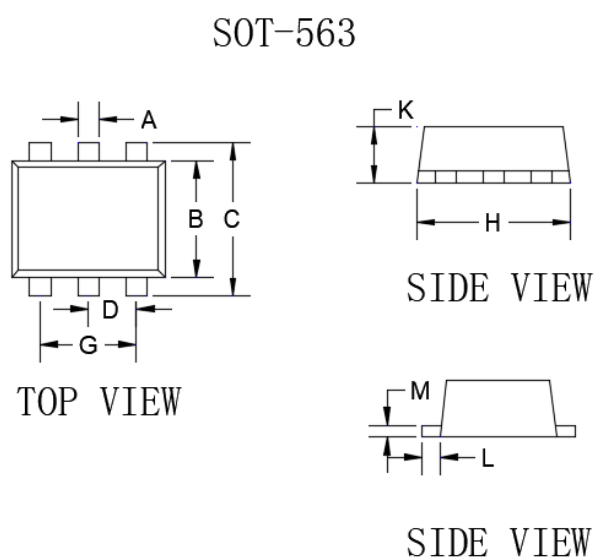


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■ Ordering Information

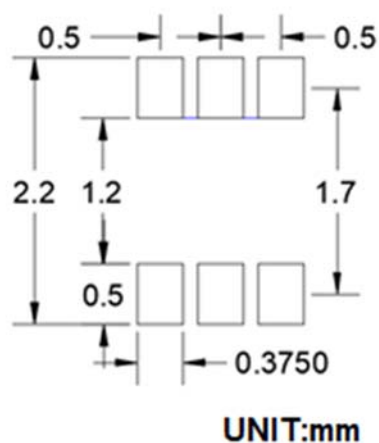
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
EMD9	F2	Approximate 0.0035	3000	30000	120000	7" reel

■ Outline Dimensions



DIM	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MM	MAX
A	0.006	0.011	0.150	0.300
B	0.043	0.051	1.100	1.300
C	0.059	0.067	1.500	1.700
D	0.016	0.024	0.400	0.600
G	0.035	0.043	0.900	1.100
H	0.059	0.067	1.500	1.700
K	0.021	0.026	0.550	0.650
L	0.004	0.011	0.100	0.300
M	0.004	0.007	0.100	0.180

■ Suggested Pad Layout



EMD9

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