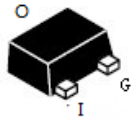
Digital Transistor

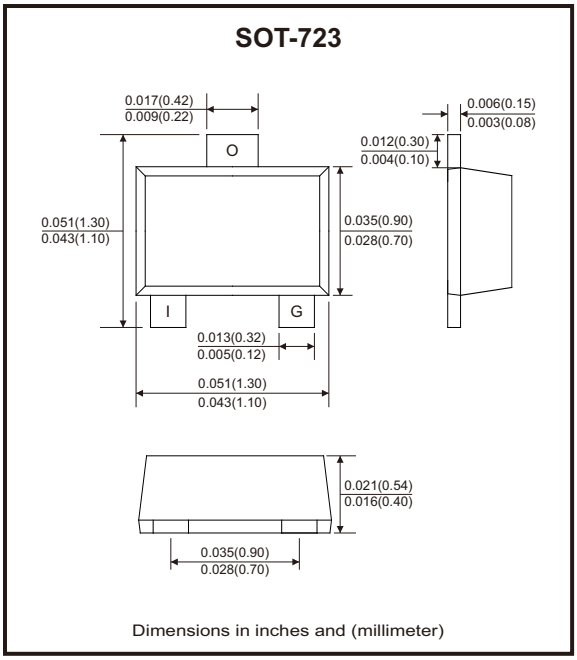
DTCxxxxM-HF Series (NPN)

RoHS Device
Halogen Free



Features

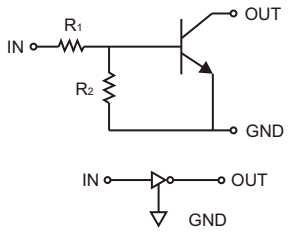
- Epitaxial planar die construction.
- Built-in biasing resistors, $R_1 \neq R_2$.



Mechanical data

- Case: SOT-723, molded plastic.
- Mounting position: Any.

Circuit Diagram



Maximum Ratings (at Ta=25°C unless otherwise noted)

Parameter		Symbol	Value	Units
Supply voltage		V_{CC}	50	V
Input voltage	DTC113ZM-HF DTC114WM-HF DTC114YM-HF DTC123JM-HF DTC123YM-HF DTC143XM-HF DTC143ZM-HF DTC124XM-HF	V_{IN}	-5 to +10 -10 to +30 -6 to +40 -5 to +12 -5 to +12 -7 to +20 -5 to +30 -10 to +40	V
Output current	DTC113ZM-HF DTC114WM-HF DTC114YM-HF DTC123JM-HF DTC123YM-HF DTC143XM-HF DTC143ZM-HF DTC124XM-HF	I_O	100 100 70 100 100 100 100 50	mA
Max. output current		I_C	100	mA
Power dissipation		P_D	100	mW
Thermal resistance, junction to ambient air		$R_{\theta JA}$	1250	°C/W
Operating and storage and temperature range		T_j , T_{STG}	-55 to +150	°C

Electrical Characteristics (at Ta=25°C unless otherwise noted)

Parameter		Symbol	Test conditions	Min	Typ	Max	Units
Input voltage	DTC113ZM-HF DTC114WM-HF DTC114YM-HF DTC123JM-HF DTC123YM-HF DTC143XM-HF DTC143ZM-HF DTC124XM-HF	$V_{I(off)}$	V_{CC} = 5V, I_O = 100μA	0.3 0.8 0.3 0.5 0.3 0.3 0.5 0.4			V
Input voltage	DTC113ZM-HF DTC114WM-HF DTC114YM-HF DTC123JM-HF DTC123YM-HF DTC143XM-HF DTC143ZM-HF DTC124XM-HF	$V_{I(on)}$	V_O = 0.3V, I_O = 20mA V_O = 0.3V, I_O = 2mA V_O = 0.3V, I_O = 1mA V_O = 0.3V, I_O = 5mA V_O = 0.3V, I_O = 20mA V_O = 0.3V, I_O = 20mA V_O = 0.3V, I_O = 5mA V_O = 0.3V, I_O = 2mA			3.0 3.0 1.4 1.1 3.0 2.5 1.3 2.5	
Output voltage	DTC123JM-HF DTC143ZM-HF DTC114YM-HF All others	$V_{O(on)}$	I_O / I_I = 5mA / 0.25mA I_O / I_I = 10mA / 0.5mA		0.1	0.3	V
Input current		I_I	V_I = 5V			7.2 0.88 0.88 3.6 3.8 1.8 1.8 0.36	mA
Output current		$I_{O(off)}$	V_{CC} = 50V, V_I = 0V			0.5	μA
DC current gain	DTC113ZM-HF DTC114WM-HF DTC114YM-HF DTC123JM-HF DTC123YM-HF DTC143XM-HF DTC143ZM-HF DTC124XM-HF	G_I	V_O = 5V, I_O = 5mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 5mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 10mA V_O = 5V, I_O = 10mA	33 24 68 80 33 30 80 68			
Input resistor	DTC113ZM-HF DTC114WM-HF DTC114YM-HF DTC123JM-HF DTC123YM-HF DTC143XM-HF DTC143ZM-HF DTC124XM-HF	$R_1(R_2)$		0.7 7 7 1.54 1.54 3.29 3.29 15.4	1(10) 10(4.7) 10(47) 2.2(47) 2.2(10) 4.7(10) 4.7(47) 22(47)	1.3 13 13 2.86 2.86 6.11 6.11 28.6	kΩ
Input resistor (R_1) tolerance		$\triangle R_1$		-30		+30	%
Resistance ratio tolerance		$\triangle R_2/R_1$		-20		+20	
Gain-bandwidth product		f_T	V_{CE} = 10V, I_E = 5mA, f = 100MHz		250		MHz

Typical Rating and Characteristic Curves (DTCxxxxM-HF Series)

Fig.1 - Derating Curve

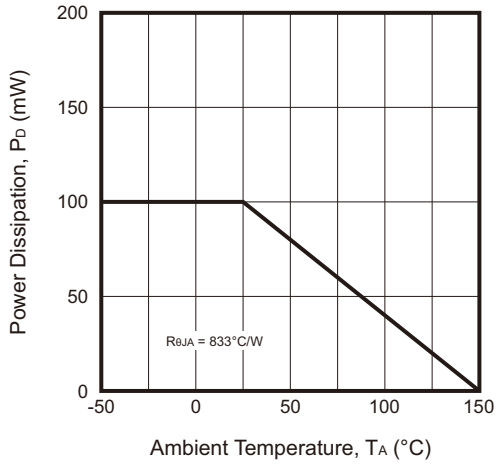


Fig.2 - $V_{CE(SAT)}$ vs. I_C

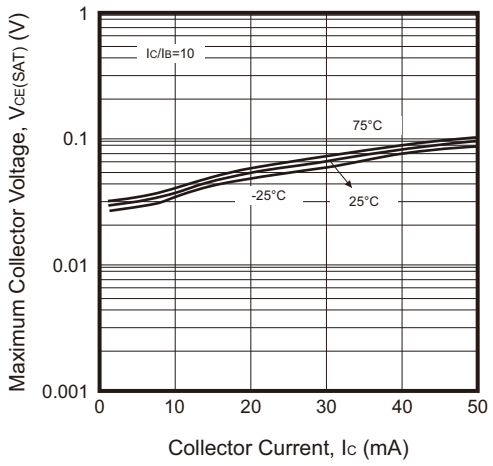


Fig.3 - DC Current Gain

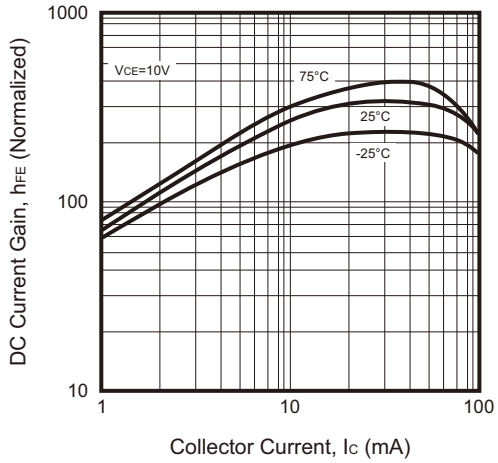


Fig.4 - Output Capacitance

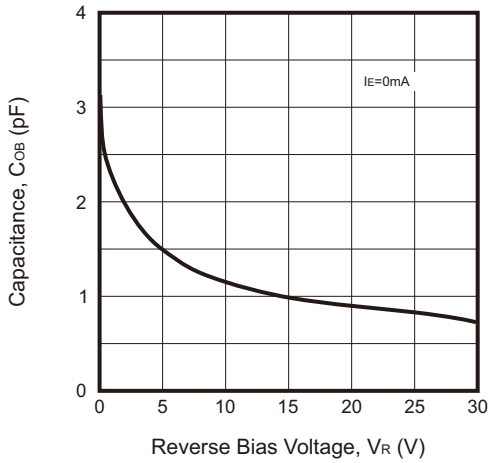


Fig.5 - Collector Current vs. Input Voltage

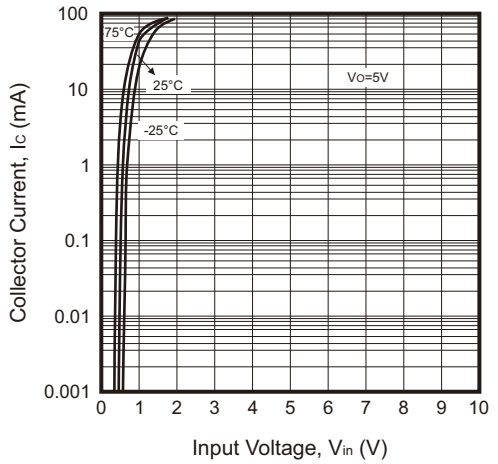
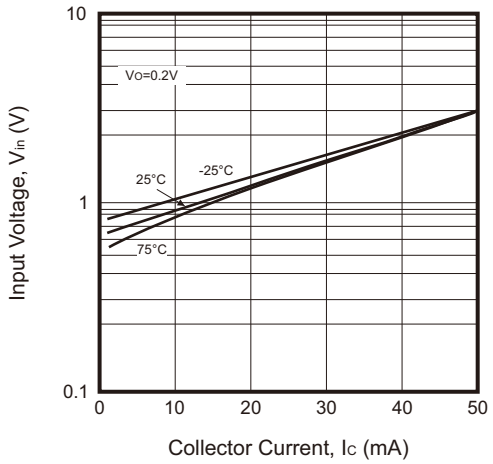
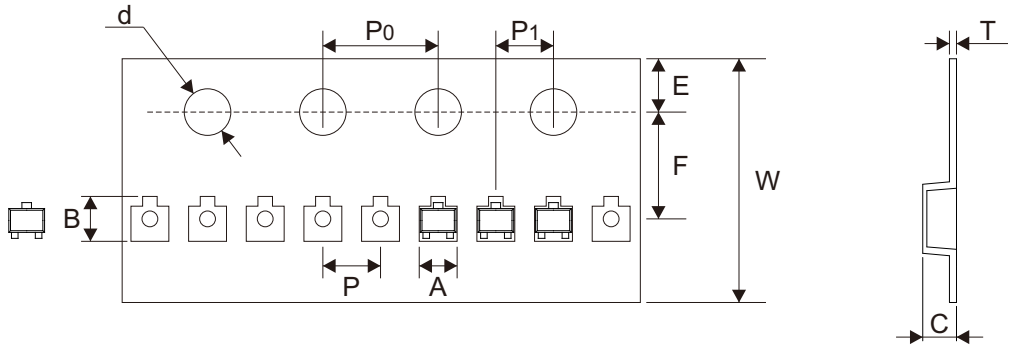
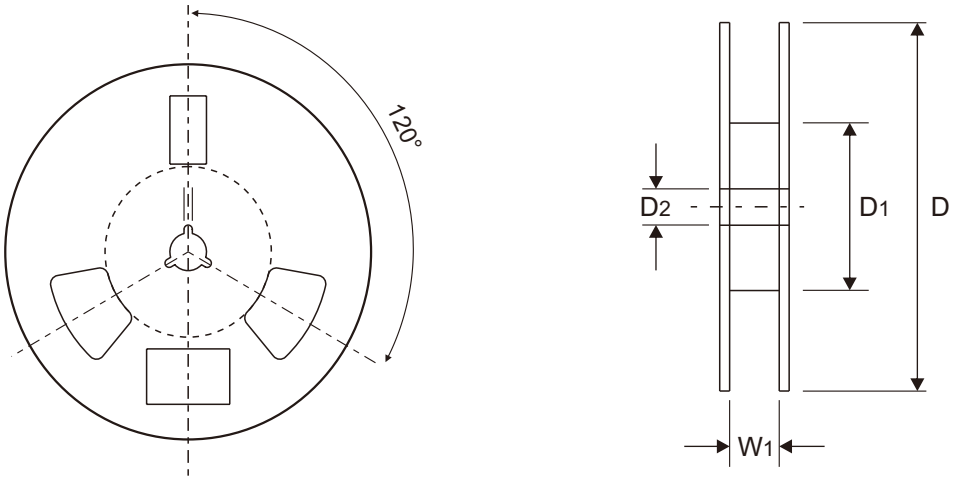


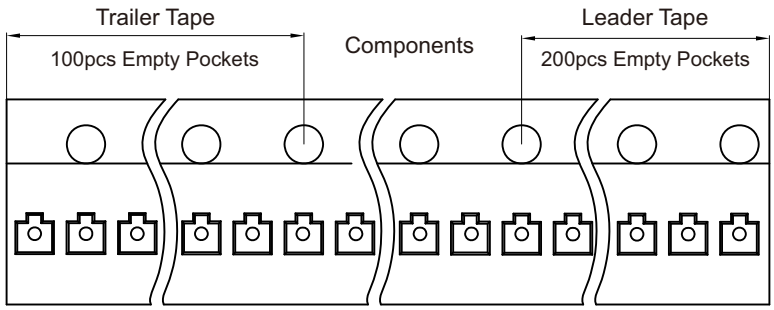
Fig.6 - Input Voltage vs. Collector Current



Reel Taping Specification





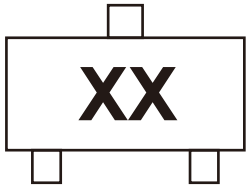


	SYMBOL	A	B	C	d	D	D1	D2
SOT-723	(mm)	1.31 ± 0.05	1.45 ± 0.05	0.61 ± 0.05	1.50 ± 0.10	178.00 ± 1.00	54.00 ± 0.50	13.00 ± 0.50
	(inch)	0.052 ± 0.002	0.057 ± 0.002	0.024 ± 0.002	0.059 ± 0.004	7.008 ± 0.039	2.126 ± 0.020	0.512 ± 0.020

	SYMBOL	E	F	P	P0	P1	T	W	W1
SOT-723	(mm)	1.75 ± 0.10	3.50 ± 0.05	2.00 ± 0.05	4.00 ± 0.10	2.00 ± 0.05	0.20 ± 0.02	8.00 + 0.30 − 0.10	9.50 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.079 ± 0.002	0.157 ± 0.004	0.079 ± 0.002	0.008 ± 0.001	0.315 + 0.012 − 0.004	0.374 ± 0.039

Marking Code

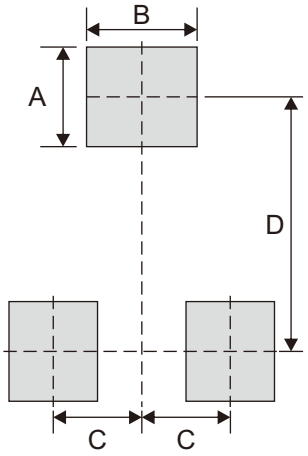
Part Number	Marking Code
DTC113ZM-HF	E21
DTC114WM-HF	84
DTC114YM-HF	64
DTC123JM-HF	E42
DTC123YM-HF	62
DTC143XM-HF	43•
DTC143ZM-HF	E23
DTC124XM-HF	N18



xx/xxx = Product type marking code

Suggested P.C.B. PAD Layout

SIZE	SOT-723	
	(mm)	(inch)
A	0.45	0.018
B	0.50	0.020
C	0.40	0.016
D	1.15	0.045



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-723	10,000	7