

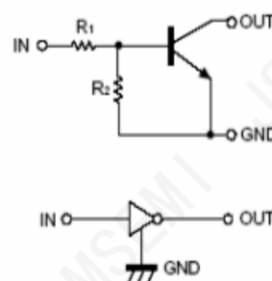
Description

The PDTC114ET-QR-JSM consists of NPN digital transistors with integrated bias resistors, designed to form an inverter circuit without external input resistors. The thin-film resistors offer complete isolation for negative biasing, minimizing parasitic effects. The devices simplify design by requiring only on/off condition configuration, making them suitable for digital logic applications.



Features

- ◆ Integrated Bias Resistors: Enable inverter circuit configuration without external input resistors (refer to equivalent circuit).
- ◆ Thin-Film Resistor Technology: Provides isolation for negative biasing and eliminates parasitic effects.
- ◆ Simplified Design: Operation requires only setting on/off conditions, reducing design complexity.
- ◆ Multiple Package Options.
- ◆ Wide Operating Range: Supports supply voltage up to 50V and input voltage from -10V to +40V.



Circuit Diagram

Applications

- ◆ Signal conditioning and switching circuits
- ◆ Digital logic circuits and inverter applications
- ◆ Consumer electronics and industrial control systems
- ◆ Microcontroller interfaces

Ordering Information

Order number	Package	Operation Temperature Range	MSL Grade	Ship, Quantity	Green
PDTC114ET-QR-JSM	SOT-23	-55~+150°C	3	T&R,3000	Rohs

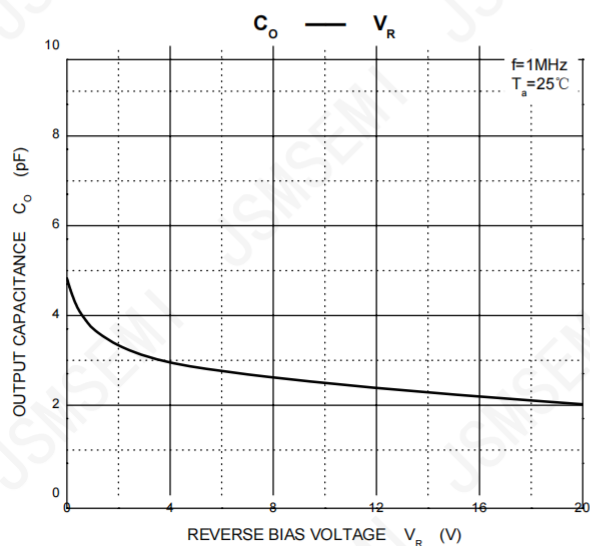
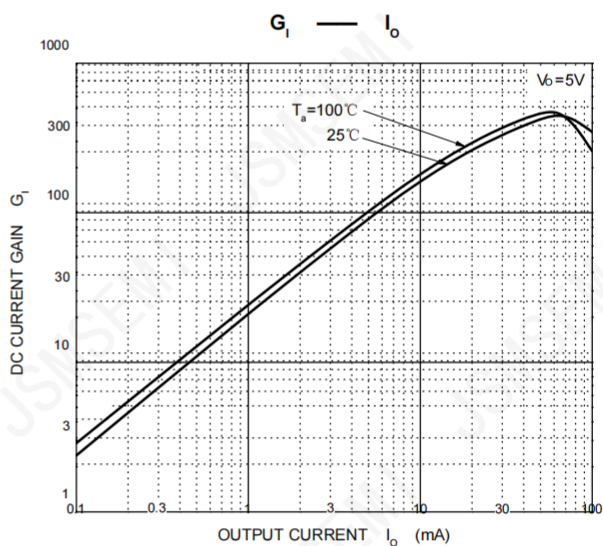
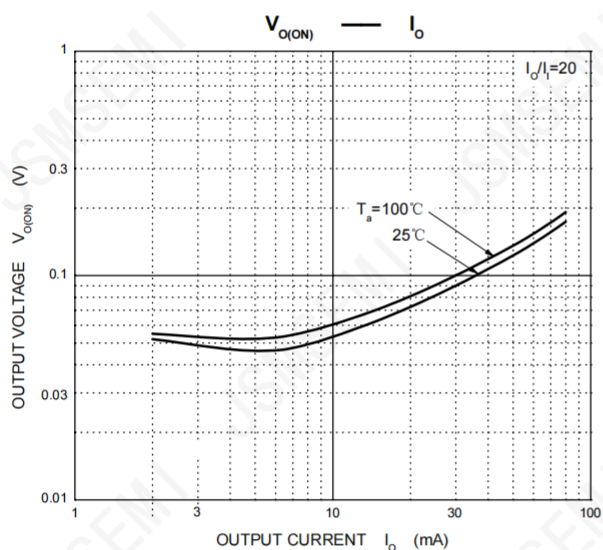
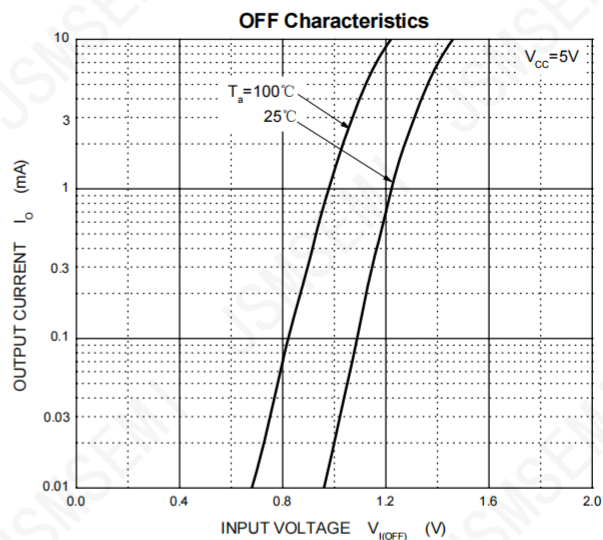
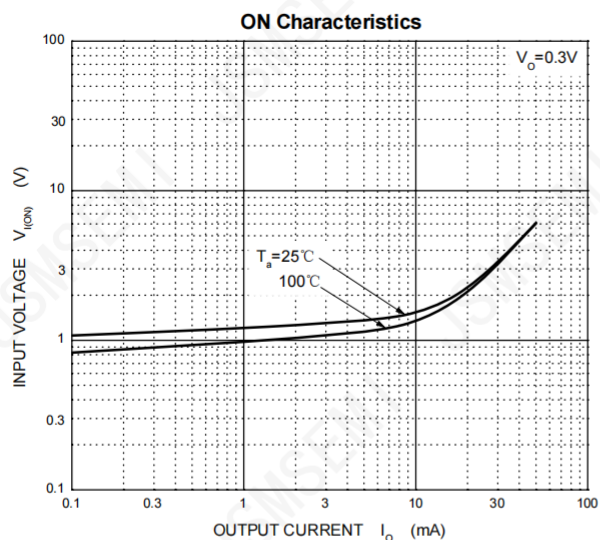
Absolute Maximum Ratings($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Limits	Unit
V_{CC}	Supply Voltage	50	V
V_{IN}	Input Voltage	-10~+40	V
I_O	Output Current	50	mA
I_{CM}	Peak Collector Current	100	mA
T_J, T_{stg}	Operation Junction and Storage Temperature Range	-55~+150	$^{\circ}\text{C}$

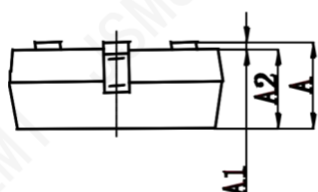
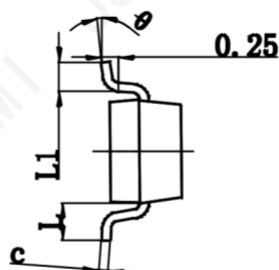
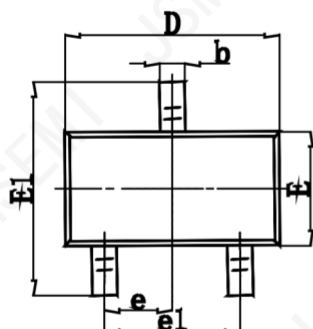
Electrical Characteristics($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input voltage	$V_{I(off)}$	$V_{CC}=5V, I_O=100\mu A$	0.5			V
	$V_{I(on)}$	$V_O=0.3V, I_O=10mA$			3	V
Output voltage	$V_{O(on)}$	$I_O/I_I=10mA/0.5mA$			0.3	V
Input current	I_I	$V_I=5V$			0.88	mA
Output current	$I_{O(off)}$	$V_{CC}=50V, V_I=0$			0.5	μA
DC current gain	G_I	$V_O=5V, I_O=5mA$	30			
Input resistance	R_I		7	10	13	k Ω
Resistance ratio	R_2/R_1		0.8	1	1.2	
Transition frequency	f_T	$V_O=10V, I_O=5mA, f=100MHz$		250		MHz

Typical Performance Curves

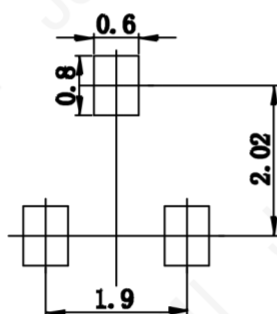


SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

Revision History

Rev.	Change	Date
V1.0	Initial version	2/23/2024

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