

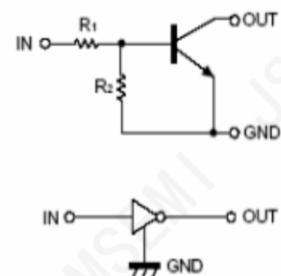
Description

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
- ◆ Consumer electronics and industrial control systems
- ◆ Digital logic circuits and inverter applications
- ◆ 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

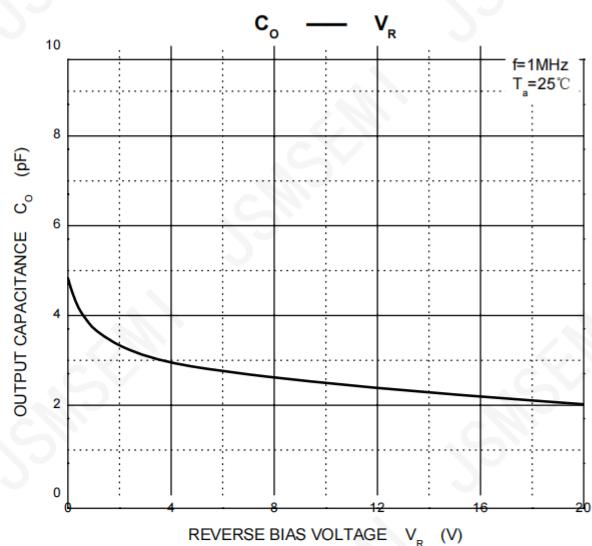
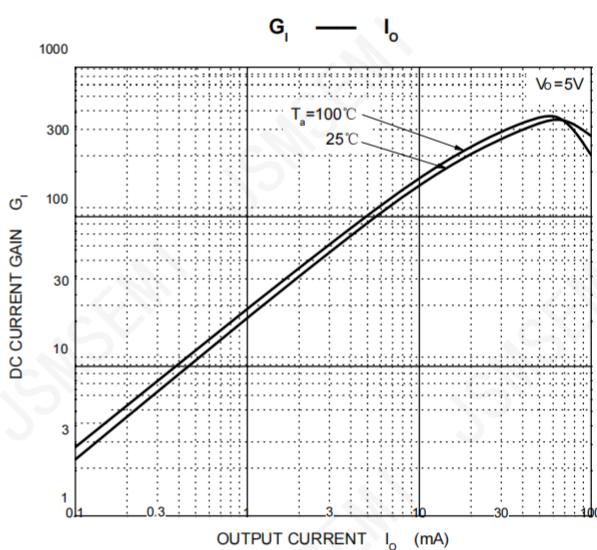
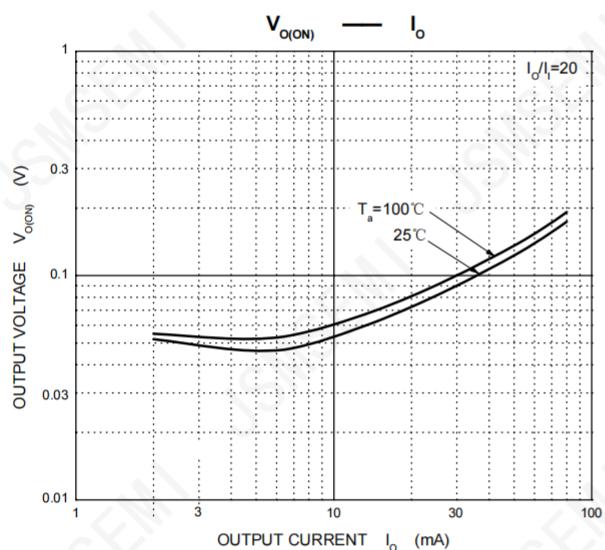
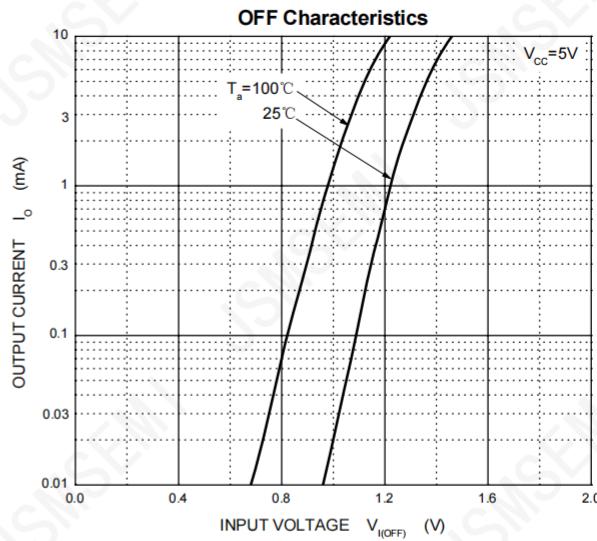
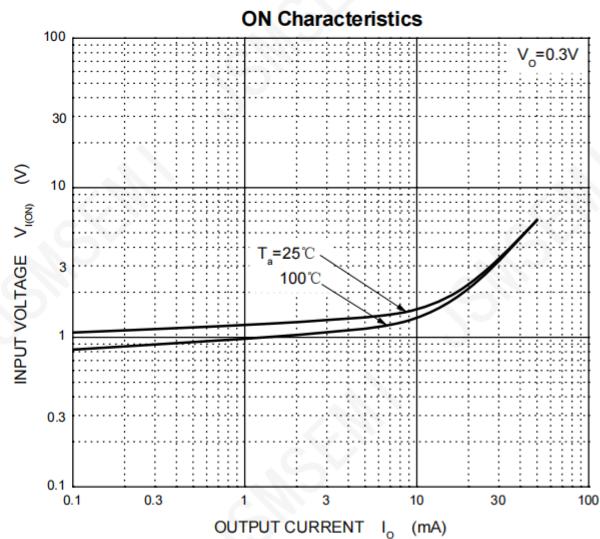
Absolute Maximum Ratings(T_A=25°C unless otherwise specified)

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	°C

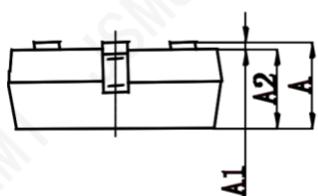
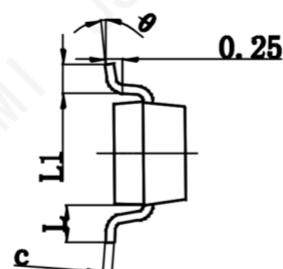
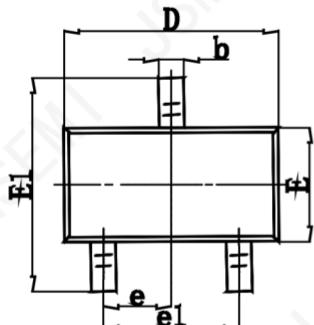
Electrical Characteristics(T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input voltage	V _{I(off)}	V _{CC} =5V,I _O =100μA	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	kΩ
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

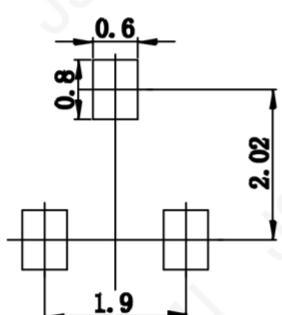


SOT-23 Package Outline Dimensions



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: ± 0.05 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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