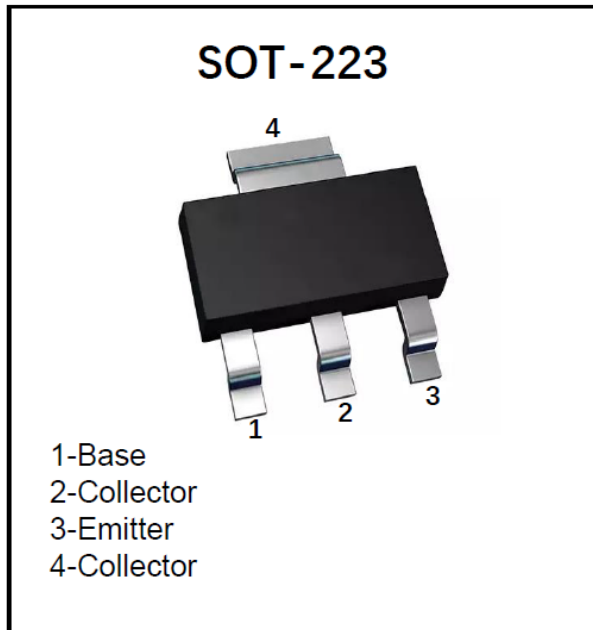


NPN Low Vcesat Transistor



Features

- Moisture Sensitivity Level 1
- Low collector-emitter saturation voltage
- Part no. with suffix "Q" means AEC-Q101 qualified

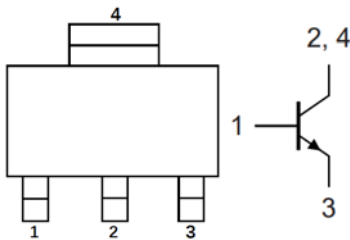
Application

- DC/DC converters; MOSFET gate driving
- Motor control; Power switches

Mechanical Data

- **Package:** SOT-223
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** S306NZ.

■Equivalent circuit



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

Item	Symbol	Unit	Conditions	Value
Collector-Emitter Voltage	V_{CEO}	V		100
Collector-Base Voltage	V_{CBO}	V		100
Emitter-Base Voltage	V_{EBO}	V		5
Collector Current	I_C	A		5.1
Power Dissipation (Note1)	P_D	W		0.7
Power Dissipation (Note2)	P_D	W		1
Junction Temperature	T_j	°C		-55 to +150
Storage Temperature	T_{stg}	°C		-55 to +150



PBSS306NZQ

RoHS
COMPLIANT

■Electrical Characteristics (Ta=25℃ unless otherwise noted)

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-Base Breakdown Voltage	V_{CBO}	V	$I_C=100\mu A, I_E=0$	100		
Collector-Emitter Breakdown Voltage	V_{CEO^*}	V	$I_C=10mA, I_B=0$	100		
Emitter-Base Breakdown Voltage	V_{EBO}	V	$I_E=100\mu A, I_C=0$	5		
Collector-Base Cut-Off Current	I_{CBO}	nA	$V_{CB}=80V, I_E=0$			100
Emitter-Base Cut-Off Current	I_{EBO}	nA	$V_{EB}=5V, I_C=0$			100
DC Current Gain	h_{FE}		$V_{CE}=2V, I_C=0.5A$	200		
	h_{FE}		$V_{CE}=2V, I_C=1A$	150		
	h_{FE}		$V_{CE}=2V, I_C=2A$	100		
	h_{FE}		$V_{CE}=2V, I_C=4A$	50		
	h_{FE}		$V_{CE}=2V, I_C=5A$	30		
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	mV	$I_C=0.5A, I_B=50mA$			40
			$I_C=1A, I_B=50mA$			75
			$I_C=1A, I_B=10mA$			150
			$I_C=2A, I_B=40mA$			165
			$I_C=4A, I_B=200mA$			240
			$I_C=4A, I_B=400mA$			220
			$I_C=5.1A, I_B=255mA$			300
Collector-Emitter Saturation Resistance	$R_{CE(sat)}$	mΩ	$I_C=4A, I_B=200mA$			60
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	V	$I_C=1A, I_B=100mA$			0.9
			$I_C=4A, I_B=400mA$			1.05
Base-Emitter Turn-On Voltage	$V_{BE(on)}$	V	$V_{CE}=2V, I_C=2A$			0.85
Output Capacitance	Cob	pF	$V_{CB}=10V, I_E=0, f=1MHz$		25	
Transition Frequency	f_T	MHz	$V_{CE}=10V, I_C=100mA, f=100MHz$		100	

■Ordering Information (Example)

PREFERRED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
PBSS306NZQ	F2	Approximate 0.11	2500	5000	25000	13" reel



■ Thermal Characteristics

Parameter	Symbol	Unit	Value
Thermal resistance, junction-to-ambient	$R_{\theta J-A}^{(1)}$	$^{\circ}\text{C/W}$	179
Thermal resistance, junction-to-ambient	$R_{\theta J-A}^{(2)}$	$^{\circ}\text{C/W}$	125

Note:

- (1) Thermal resistance from junction to ambient, mounted on FR4 P.C.B. with standard footprint.
- (2) Thermal resistance from junction to ambient, mounted on FR4 P.C.B. with 1cm² copper collector pad area.

■ Characteristics (Typical)

Fig.1 - Static characteristic

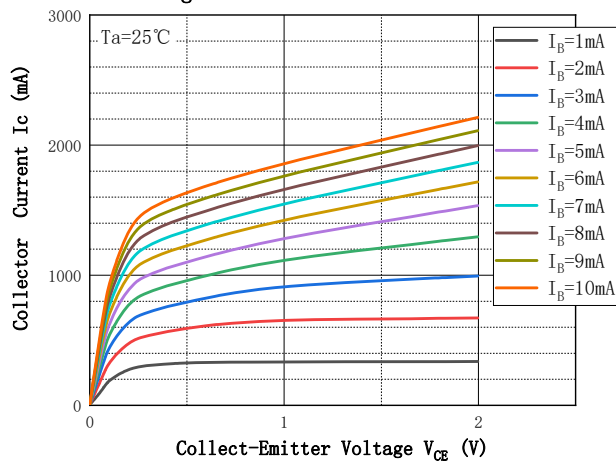


Fig.2 - DC Current Gain

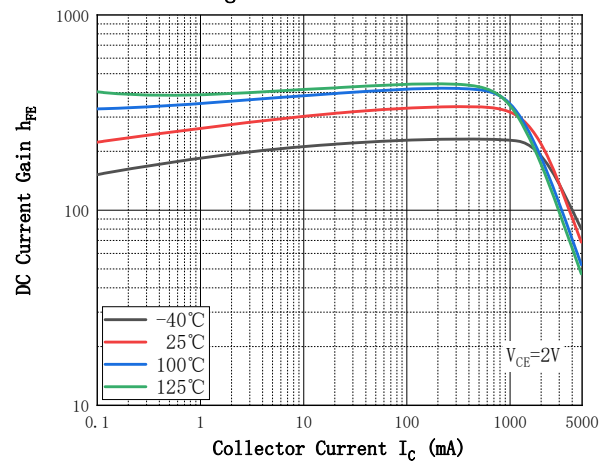


Fig.3 - Collect-Emittor Saturation Voltage

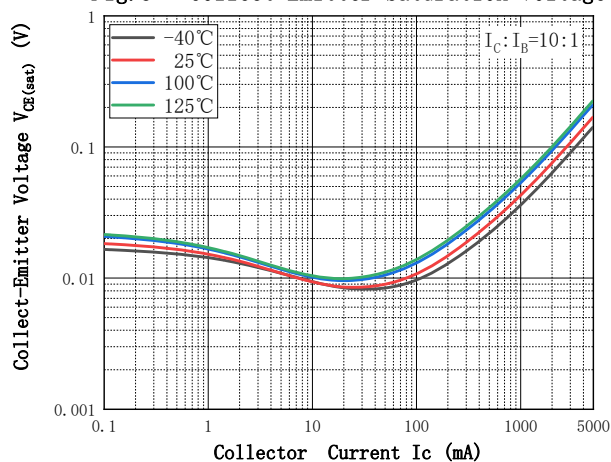


Fig.4 - Collect-Emittor Saturation Voltage

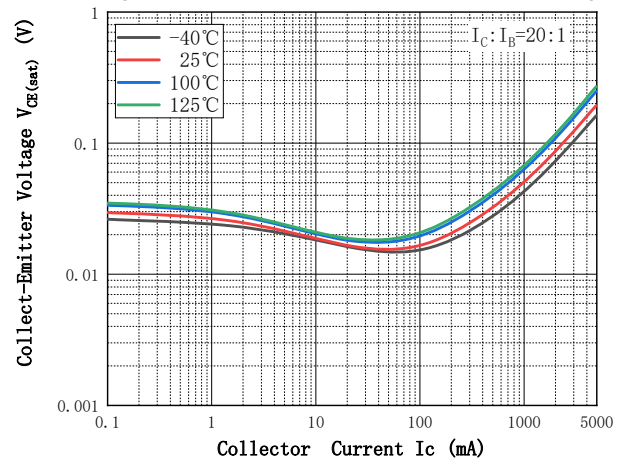


Fig. 5 - Base-Emitter Voltage

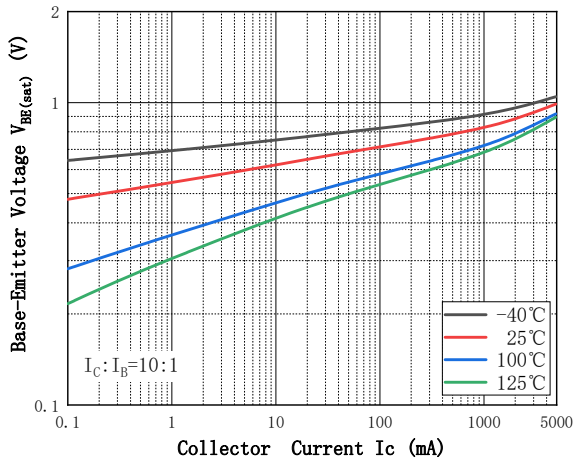


Fig. 6 - Base-Emitter Voltage

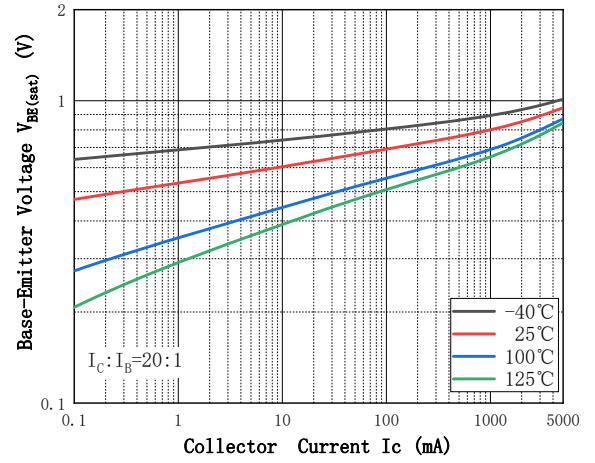


Fig. 7 - Base-Emitter On Voltage

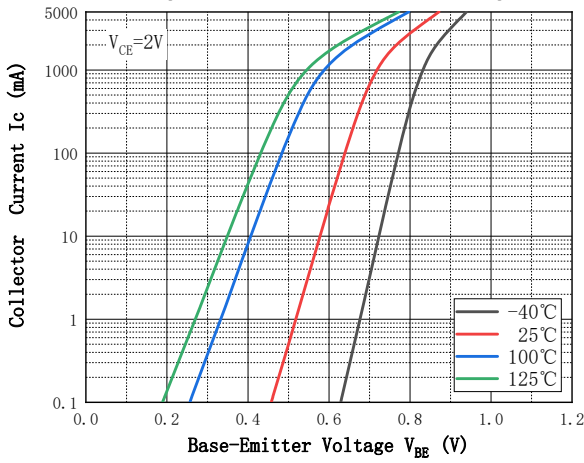


Fig. 8 - Cob/Cib—VCB/VEB

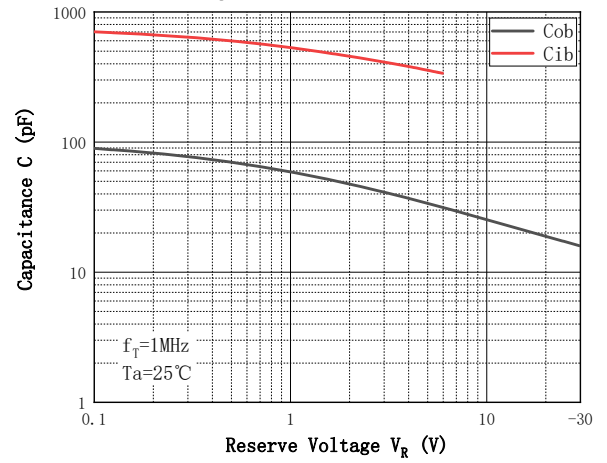
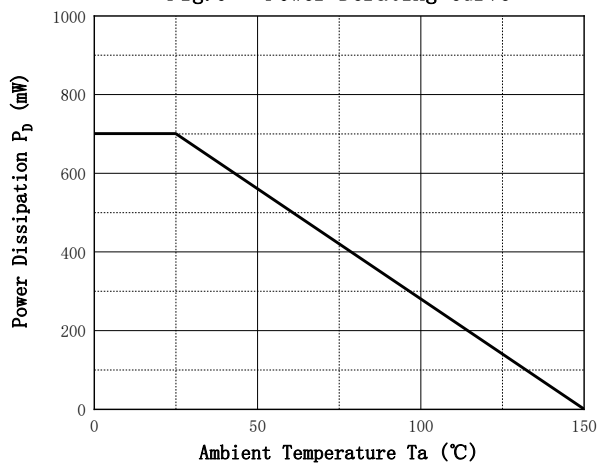
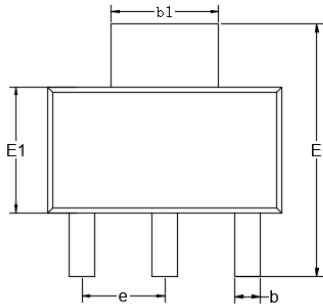
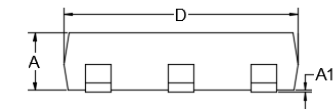


Fig. 9 - Power Derating Curve



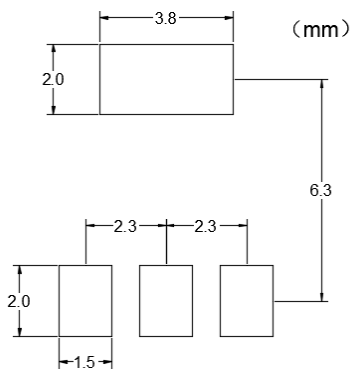


■SOT-223 Package Outline Dimensions



DIM	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.0591	0.0670	1.5000	1.7000
A1	0.0008	0.0039	0.0200	0.1000
b	0.0259	0.0330	0.6600	0.8400
b1	0.1140	0.1220	2.9000	3.1000
c	0.0090	0.0138	0.2300	0.3500
D	0.2480	0.2640	6.3000	6.7000
E	0.2637	0.2874	6.7000	7.3000
E1	0.1290	0.1460	3.3000	3.7000
e	0.0866	0.0945	2.2000	2.4000
L	0.0295	0.0492	0.7500	1.2500
θ	0°	10°	0°	10°

■SOT-223 Suggested Pad Layout





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