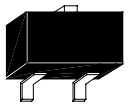
HMBZ5221B
thru
HMBZ5257B ZENER DIODES



SOT-23

Thermal Characteristics

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board T_A=25°C, Derate above 25°C	P_D	225 1.8	mW mW/°C
Total Device Dissipation Alumina Substrate**T_A=25°C, Derate above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	°C

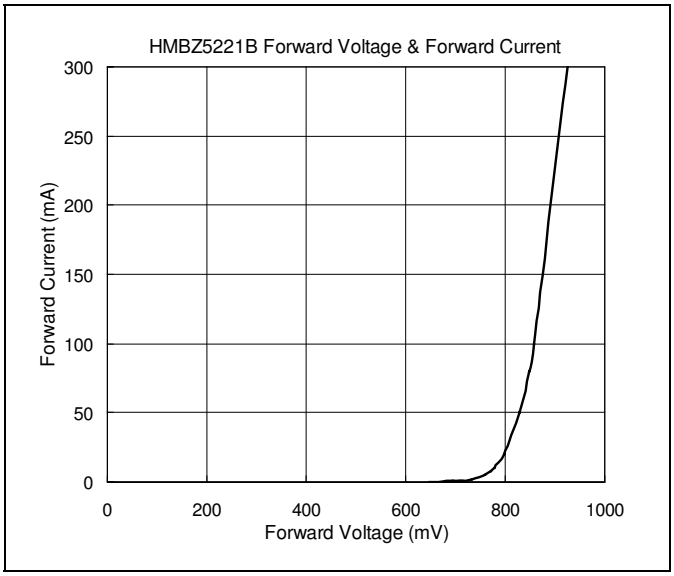
*FR-5 - 1.0×0.75×0.062 in. **Alumina - 0.4×0.3×0.024 in. 99.5% alumina.

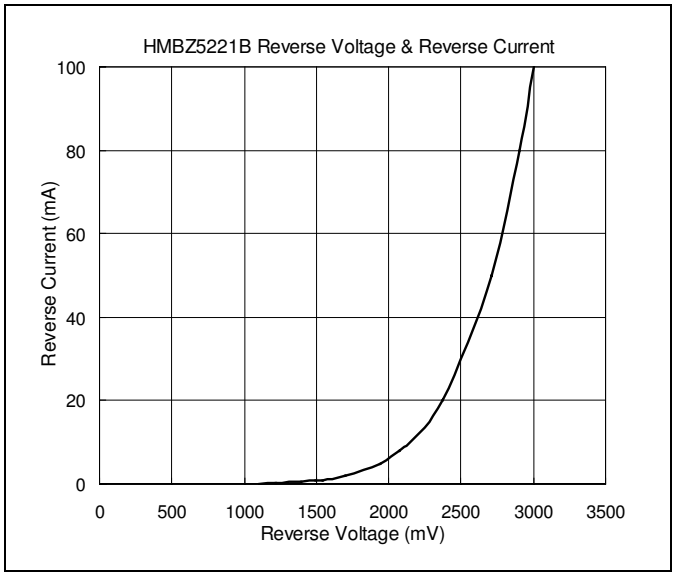
Electrical Characteristic (V_F=0.9V Max. @I_F=10mA for all types.)

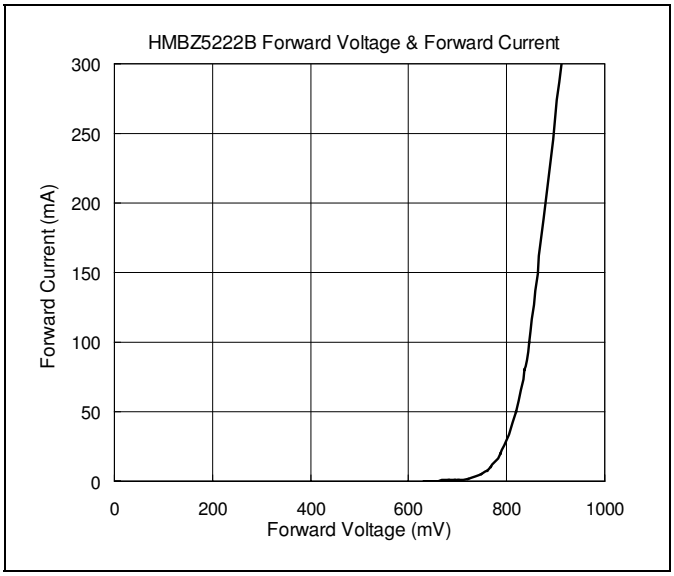
Device	Marking Code	Test Current I_{ZT}(mA)	Zener Voltage V_Z(V)	Z_{ZK} I_Z=0.25mA ΩMax.	Z_{ZT} I_Z=I_{ZT} ΩMax.	Max. Reverse Current	
						I_R(uA)	@V_R(V)
HMBZ5221B	18A	20	2.4 ±5%	1200	30	100	1.0
HMBZ5222B	18B	20	2.5 ±5%	1250	30	100	1.0
HMBZ5223B	18C	20	2.7 ±5%	1300	30	75	1.0
HMBZ5225B	18E	20	3.0 ±5%	1600	29	50	1.0
HMBZ5226B	8A	20	3.3 ±5%	1600	28	25	1.0
HMBZ5227B	8B	20	3.6 ±5%	1700	24	15	1.0
HMBZ5228B	8C	20	3.9 ±5%	1900	23	10	1.0
HMBZ5229B	8D	20	4.3 ±5%	2000	22	5.0	1.0
HMBZ5230B	8E	20	4.7 ±5%	1900	19	5.0	2.0
HMBZ5231B	8F	20	5.1 ±5%	1600	17	5.0	2.0
HMBZ5232B	8G	20	5.6 ±5%	1600	11	5.0	3.0
HMBZ5233B	8H	20	6.0 ±5%	1600	7.0	5.0	3.5
HMBZ5234B	8J	20	6.2 ±5%	1000	7.0	5.0	4.0
HMBZ5235B	8K	20	6.8 ±5%	750	5.0	3.0	5.0
HMBZ5236B	8L	20	7.5 ±5%	500	6.0	3.0	6.0
HMBZ5237B	8M	20	8.2 ±5%	500	8.0	3.0	6.5
HMBZ5238B	8N	20	8.7 ±5%	600	8.0	3.0	6.5
HMBZ5239B	8P	20	9.1 ±5%	600	10	3.0	7.0
HMBZ5240B	8Q	20	10 ±5%	600	17	3.0	8.0
HMBZ5241B	8R	20	11 ±5%	600	22	2.0	8.4
HMBZ5242B	8S	20	12 ±5%	600	30	1.0	9.1
HMBZ5243B	8T	9.5	13 ±5%	600	13	0.5	9.9
HMBZ5244B	8U	9.0	14 ±5%	600	15	0.1	10

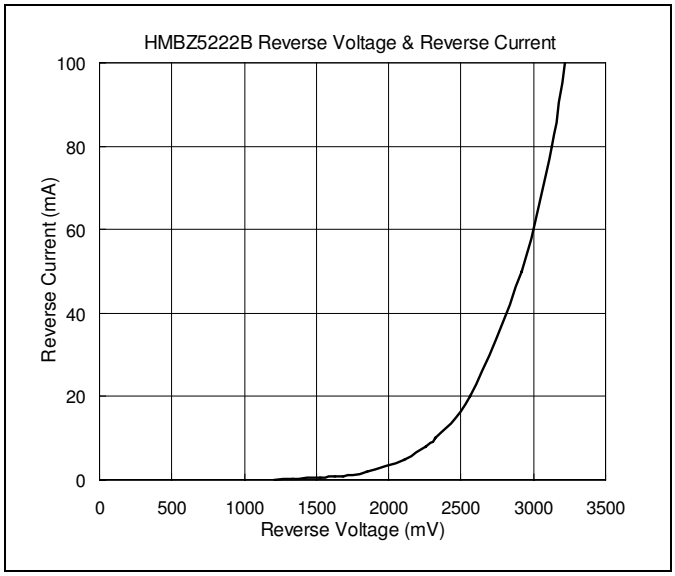
HMBZ5245B	8V	8.5	15 ±5%	600	16	0.1	11
HMBZ5246B	8W	7.8	16 ±5%	600	17	0.1	12
HMBZ5247B	8X	7.4	17 ±5%	600	19	0.1	13
HMBZ5248B	8Y	7.0	18 ±5%	600	21	0.1	14
HMBZ5249B	8Z	6.6	19 ±5%	600	23	0.1	14
HMBZ5250B	81A	6.2	20 ±5%	600	25	0.1	15
HMBZ5251B	81B	5.6	22 ±5%	600	29	0.1	17
HMBZ5252B	81C	5.2	24 ±5%	600	33	0.1	18
HMBZ5253B	81D	5.0	25 ±5%	600	35	0.1	19
HMBZ5254B	81E	4.6	27 ±5%	600	41	0.1	21
HMBZ5255B	81F	4.5	28 ±5%	600	44	0.1	21
HMBZ5256B	81G	4.2	30 ±5%	600	49	0.1	23
HMBZ5257B	81H	3.8	33 ±5%	700	58	0.1	25

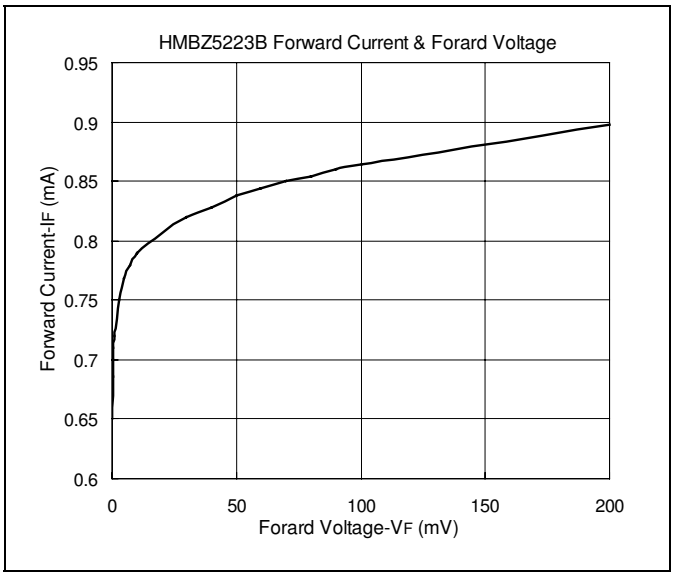
Characteristics Curve

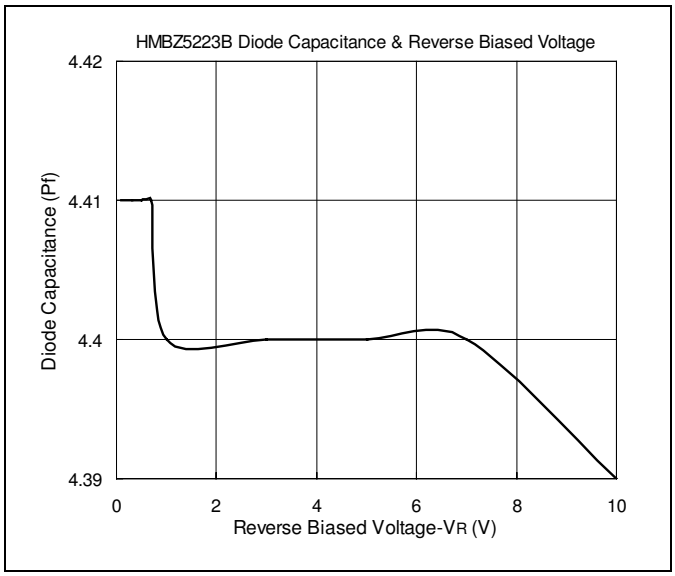


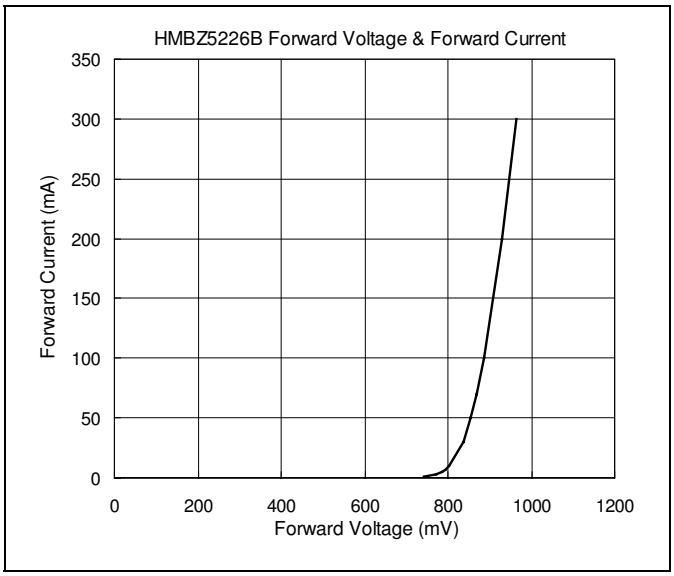


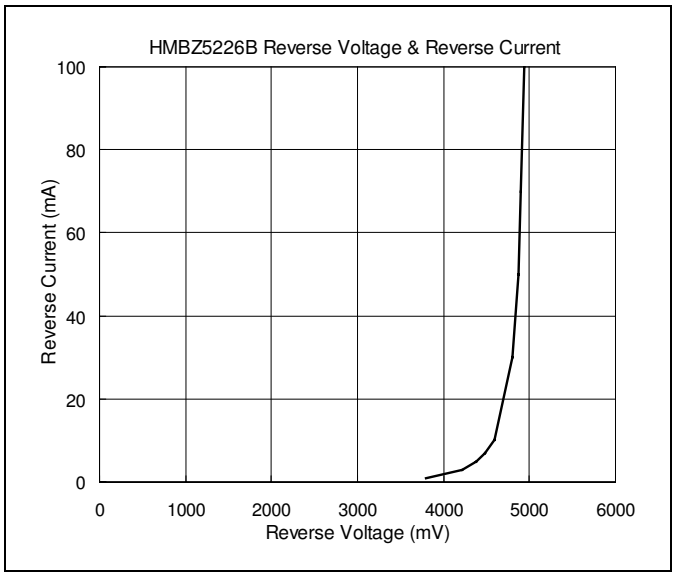


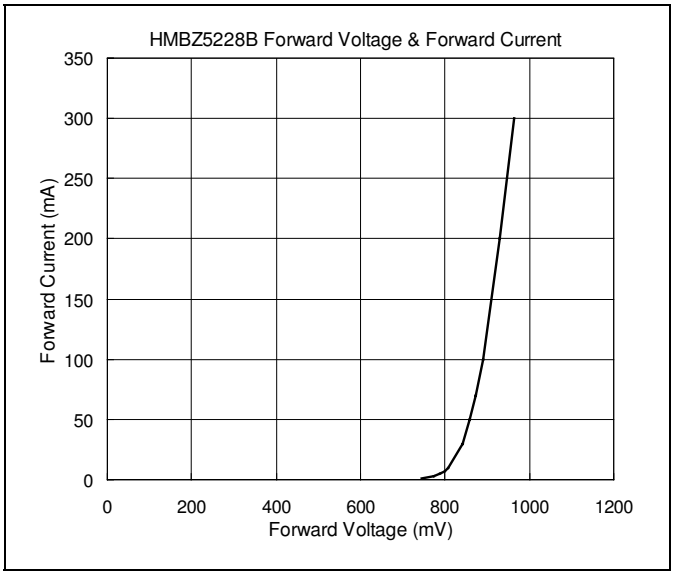


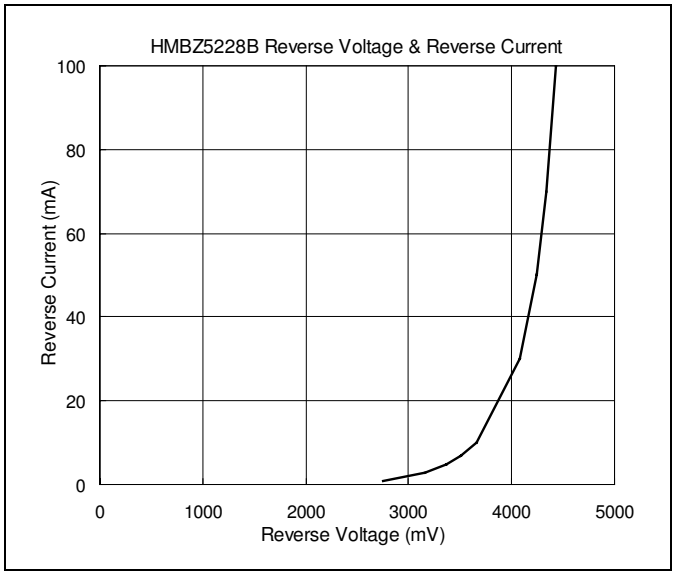

HMBZ5223B Forward Current & Forard Voltage
Forward Current-IF (mA)
0.95
0.9
0.85
0.8
0.75
0.7
0.65
0.6
0
50
100
150
200
Forard Voltage-VF (mV)

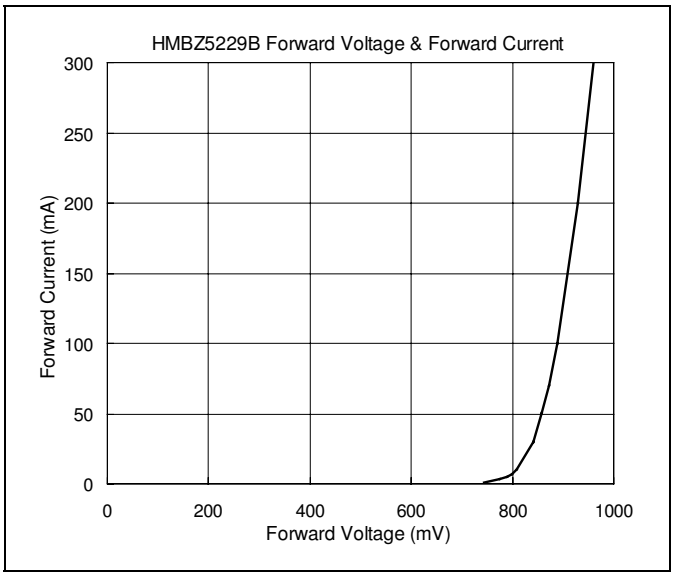

HMBZ5223B Diode Capacitance & Reverse Biased Voltage
Diode Capacitance (Pf)
4.42
4.41
4.4
4.39
0
2
4
6
8
10
Reverse Biased Voltage-VR (V)

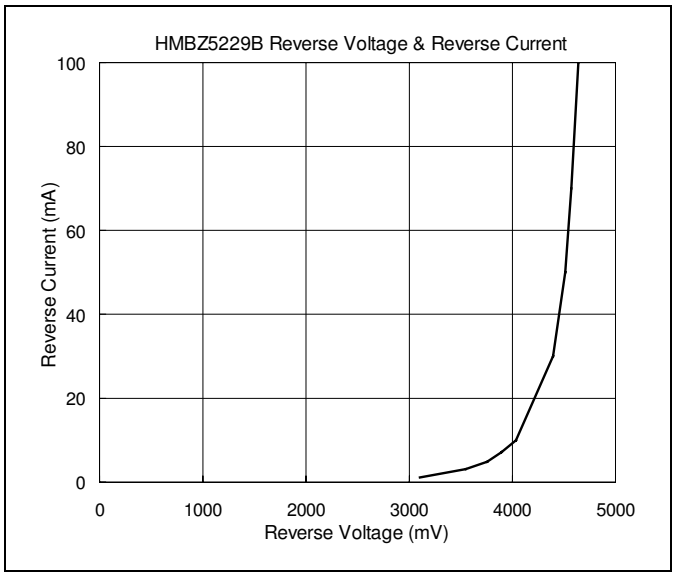

HMBZ5226B Forward Voltage & Forward Current
Forward Current (mA)
350
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

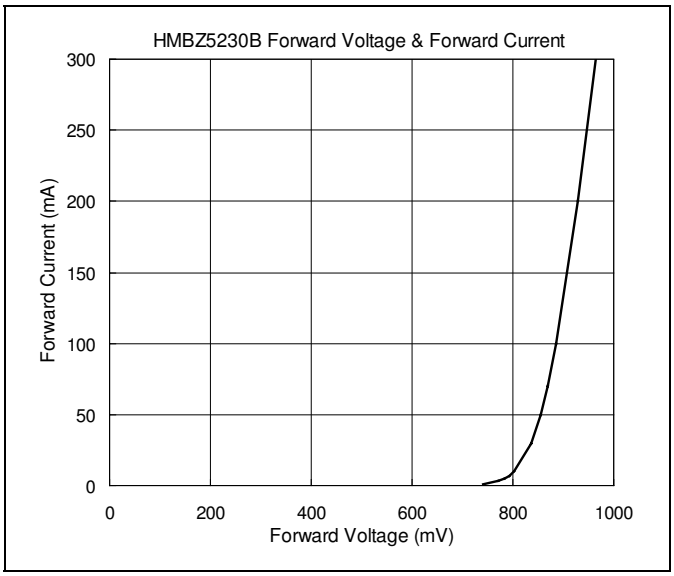

HMBZ5226B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
0
1000
2000
3000
4000
5000
6000
Reverse Voltage (mV)

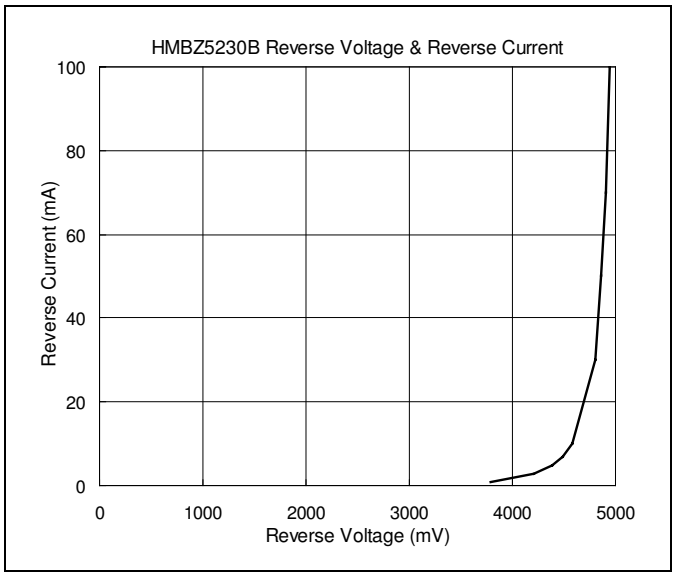

HMBZ5228B Forward Voltage & Forward Current
Forward Current (mA)
350
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

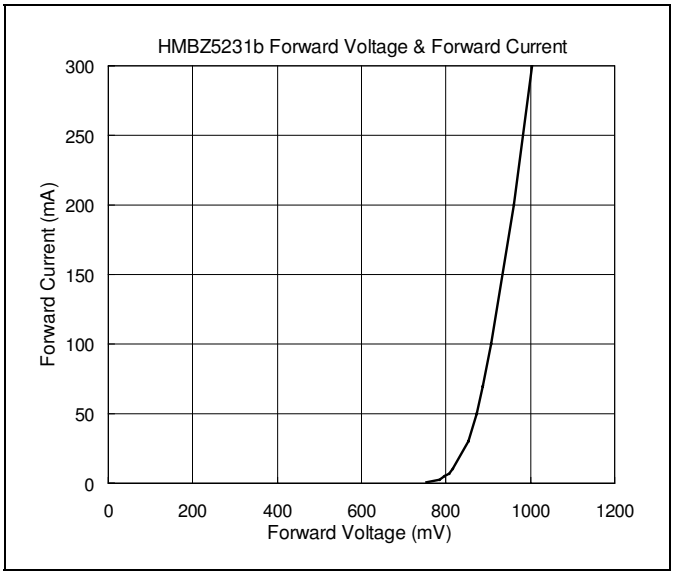

HMBZ5228B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
0
1000
2000
3000
4000
5000
Reverse Voltage (mV)

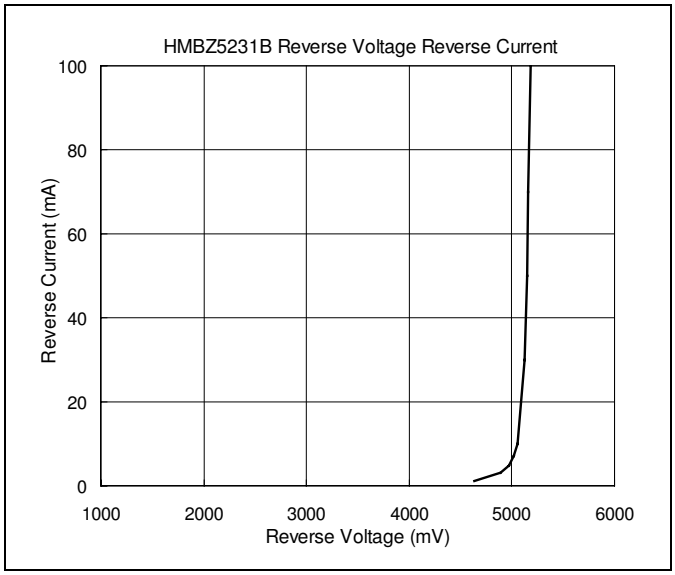

HMBZ5229B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
Forward Voltage (mV)

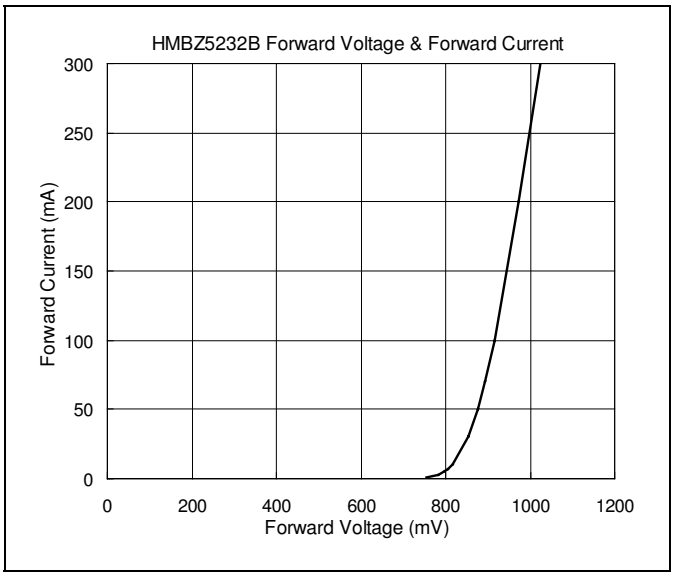

HMBZ5229B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
0
1000
2000
3000
4000
5000
Reverse Voltage (mV)

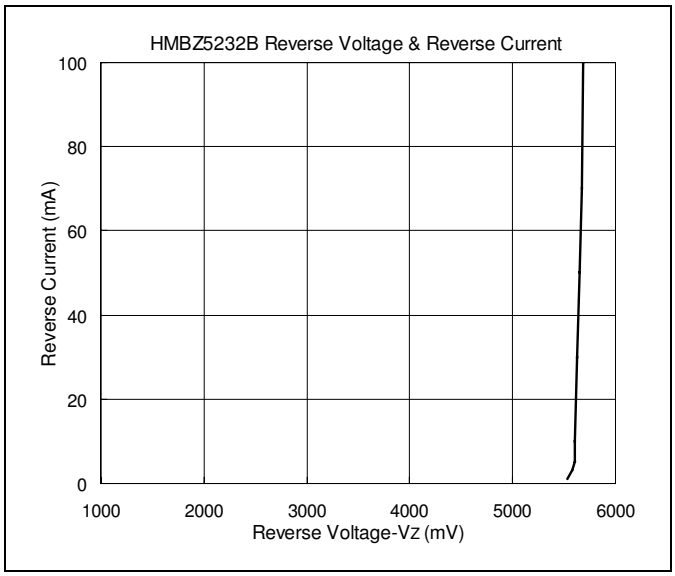

HMBZ5230B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
Forward Voltage (mV)

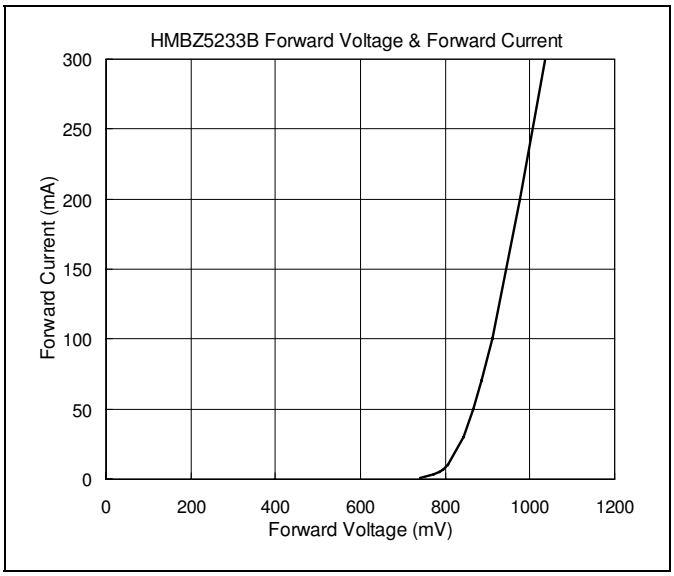

HMBZ5230B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
0
1000
2000
3000
4000
5000
Reverse Voltage (mV)

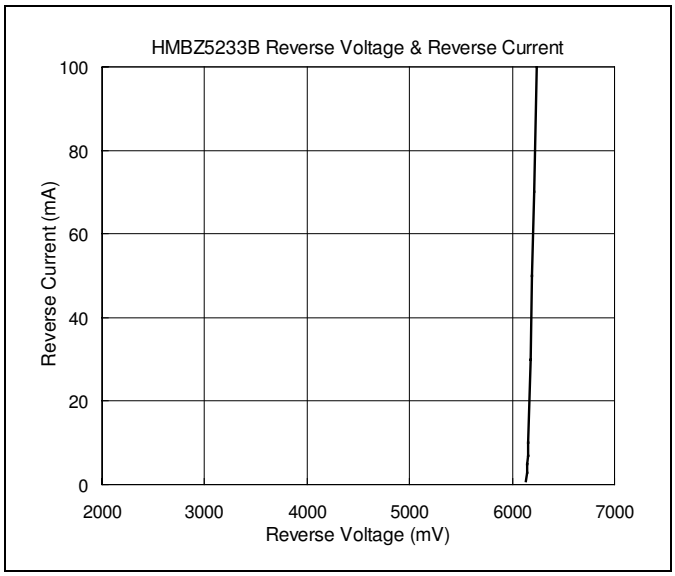

HMBZ5231b Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

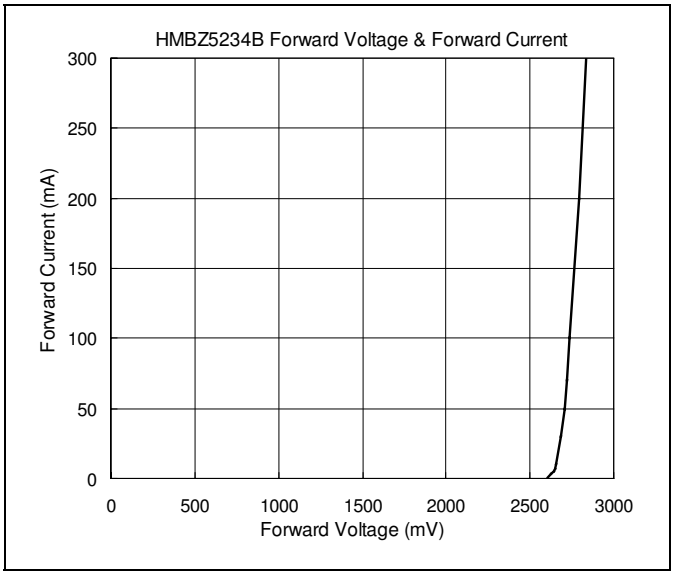

HMBZ5231B Reverse Voltage Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
1000
2000
3000
4000
5000
6000
Reverse Voltage (mV)

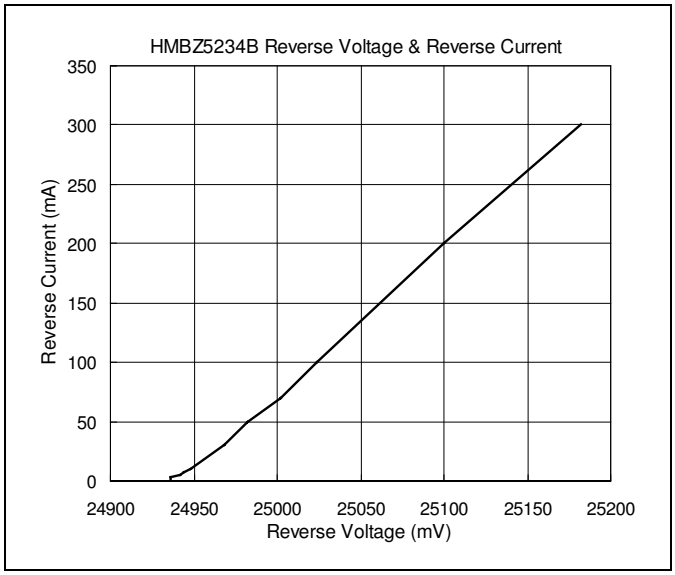

HMBZ5232B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

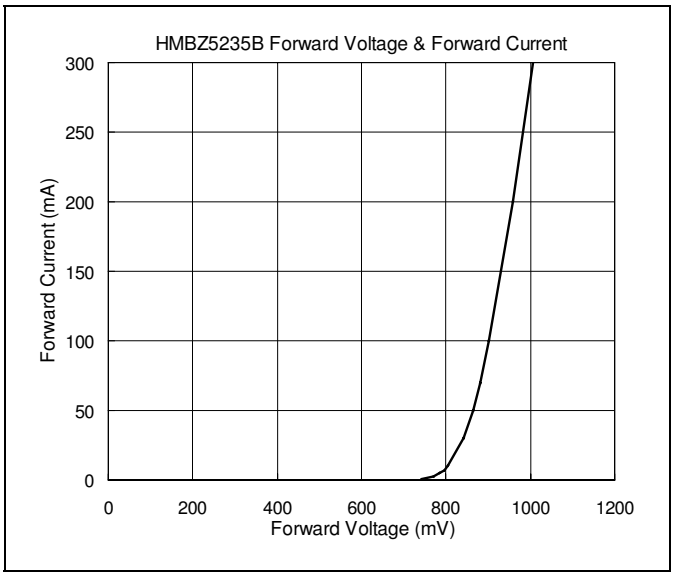

HMBZ5232B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
1000
2000
3000
4000
5000
6000
Reverse Voltage-Vz (mV)

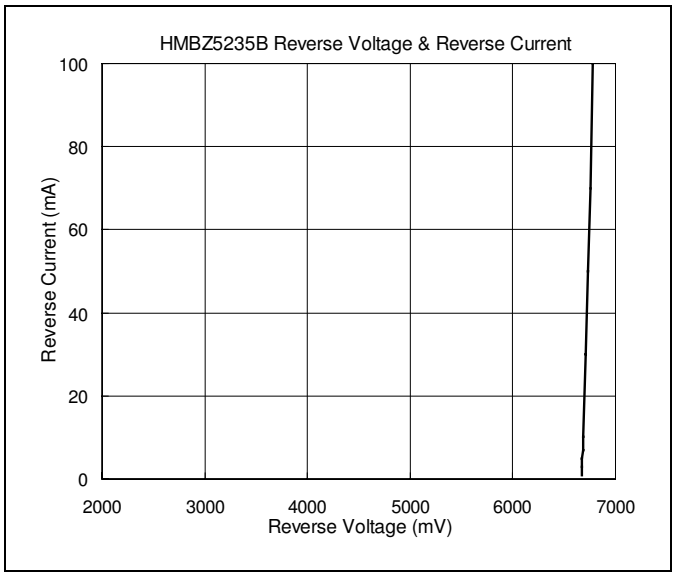

HMBZ5233B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

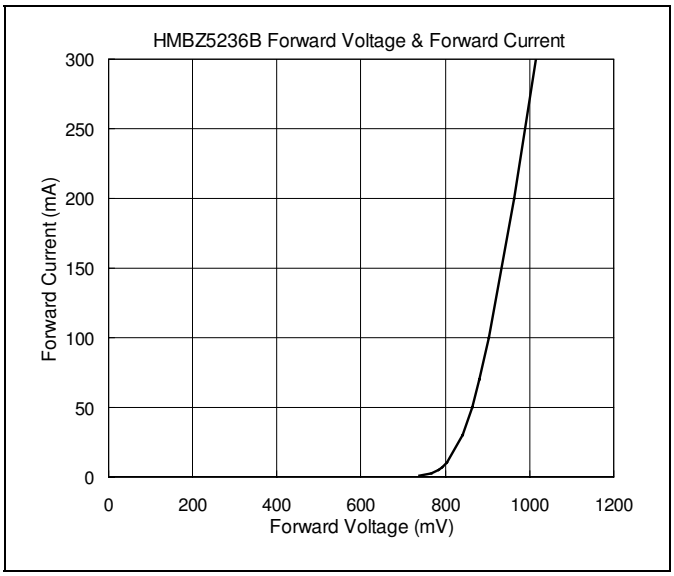

HMBZ5233B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
2000
3000
4000
5000
6000
7000
Reverse Voltage (mV)

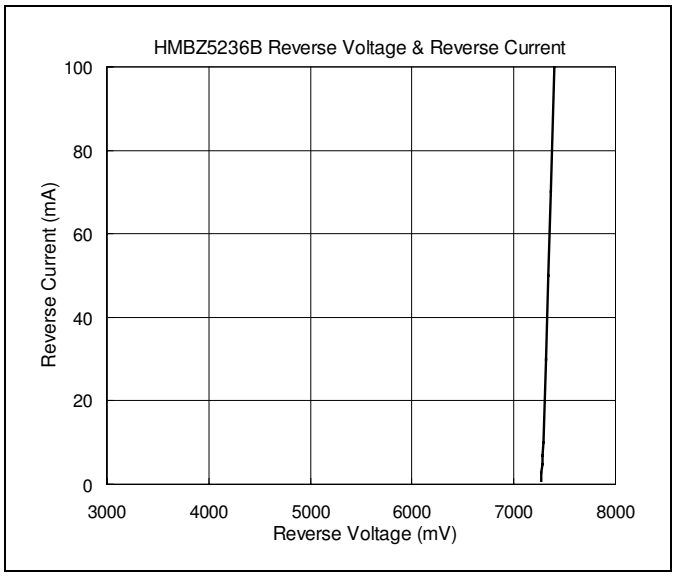

HMBZ5234B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
500
1000
1500
2000
2500
3000
Forward Voltage (mV)

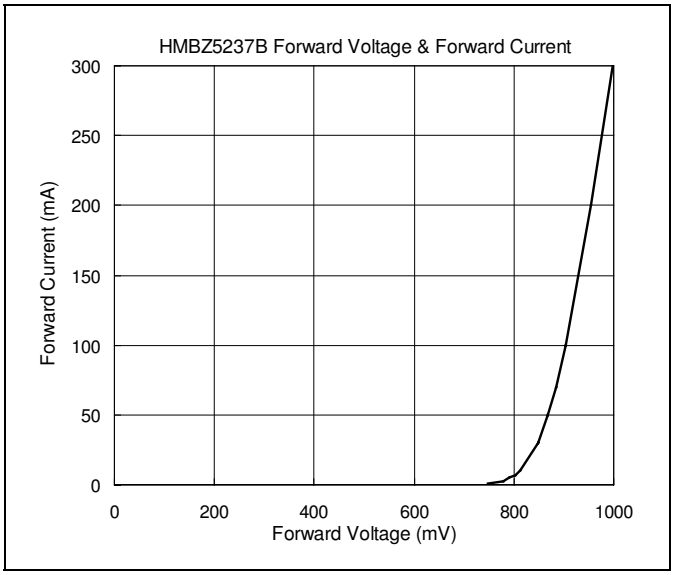

HMBZ5234B Reverse Voltage & Reverse Current
Reverse Current (mA)
350
300
250
200
150
100
50
0
24900
24950
25000
25050
25100
25150
25200
Reverse Voltage (mV)

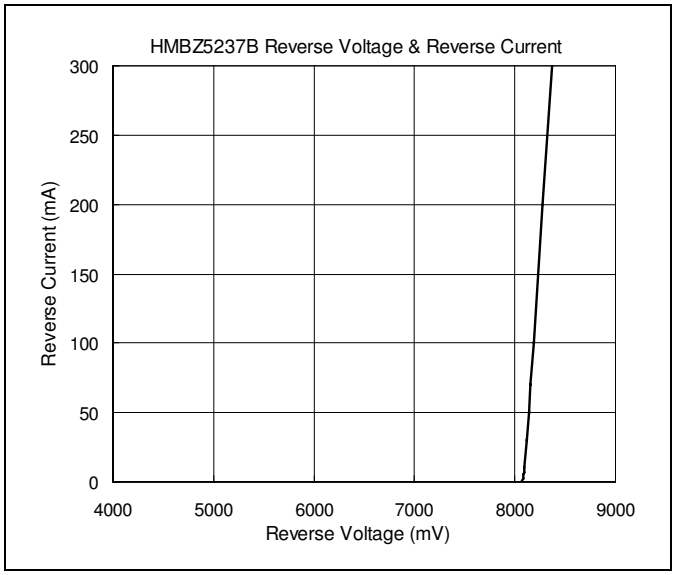

HMBZ5235B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

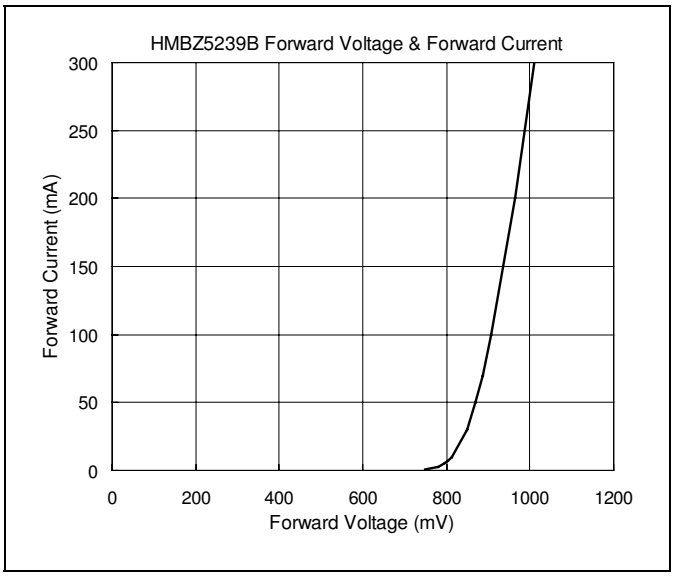

HMBZ5235B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
2000
3000
4000
5000
6000
7000
Reverse Voltage (mV)

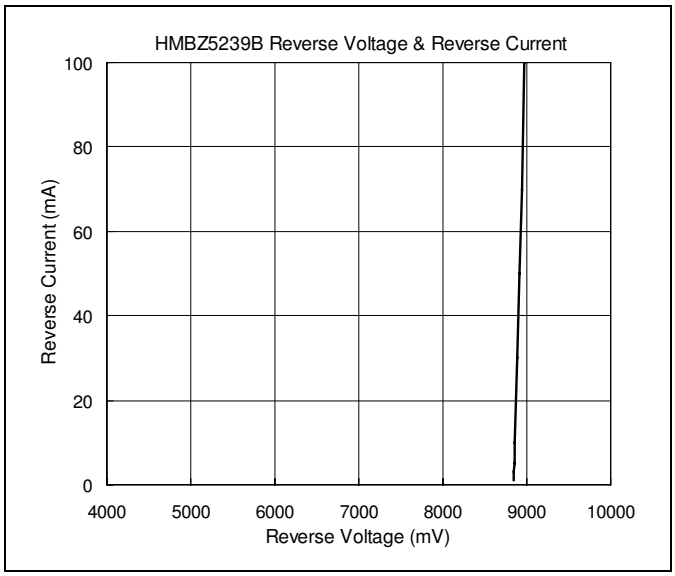

HMBZ5236B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

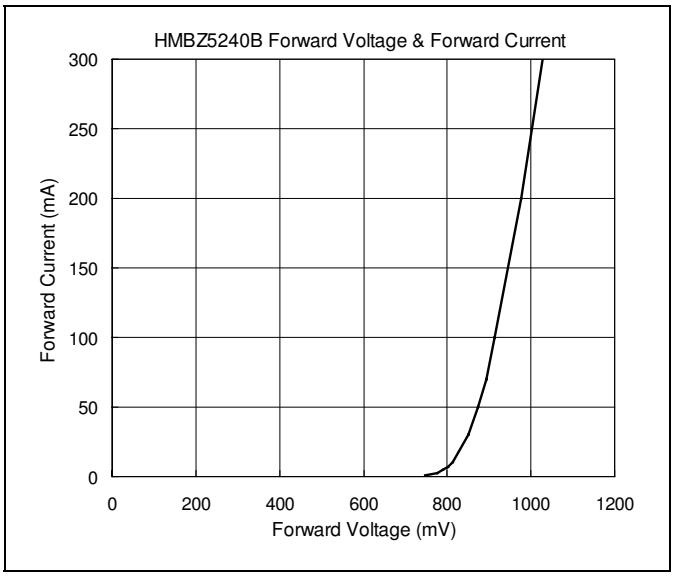

HMBZ5236B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
3000
4000
5000
6000
7000
8000
Reverse Voltage (mV)

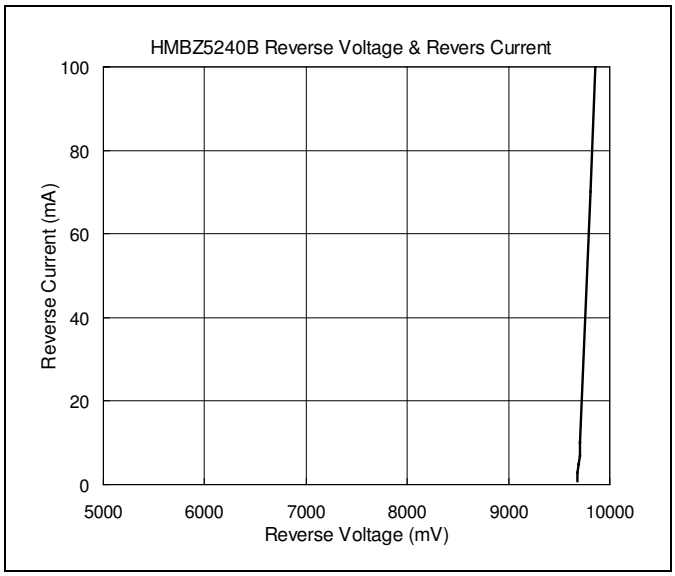

HMBZ5237B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
Forward Voltage (mV)

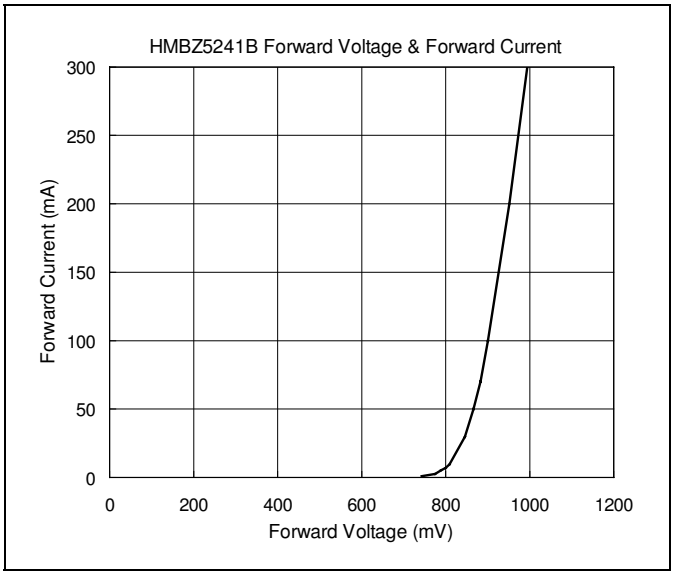

HMBZ5237B Reverse Voltage & Reverse Current
Reverse Current (mA)
300
250
200
150
100
50
0
4000
5000
6000
7000
8000
9000
Reverse Voltage (mV)

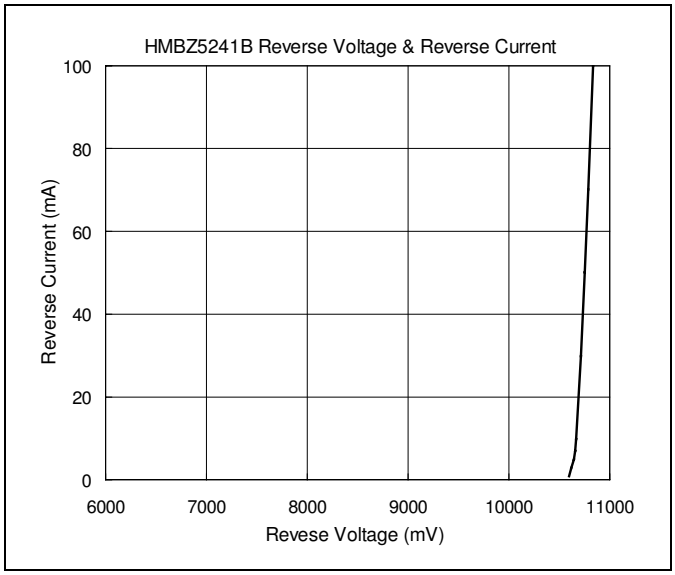

HMBZ5239B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

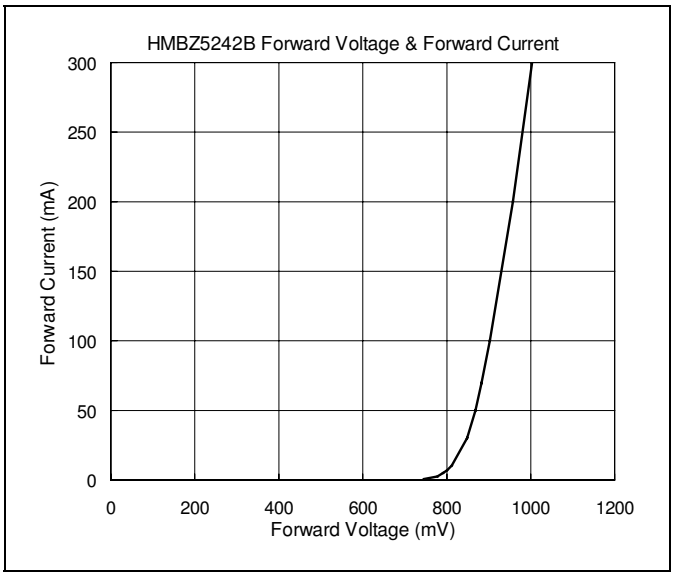

HMBZ5239B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
4000
5000
6000
7000
8000
9000
10000
Reverse Voltage (mV)

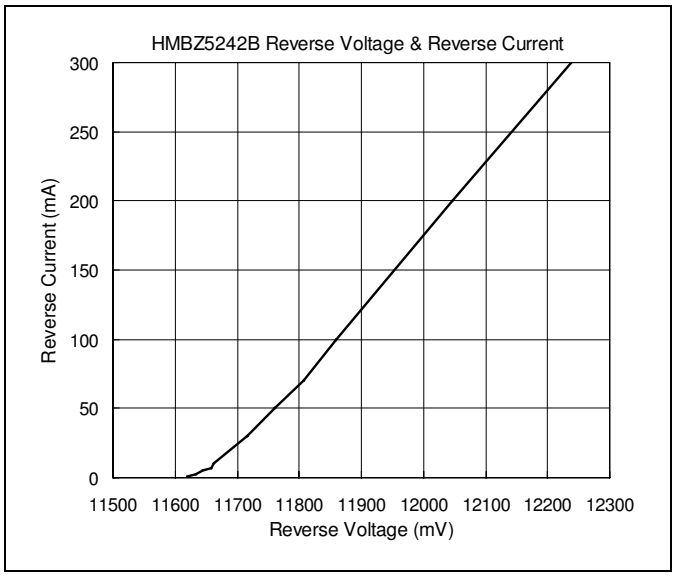

HMBZ5240B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

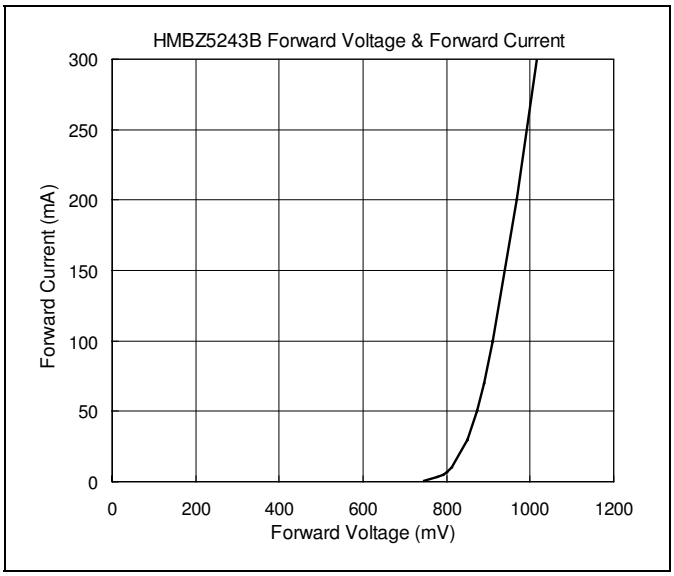

HMBZ5240B Reverse Voltage & Revers Current
Reverse Current (mA)
100
80
60
40
20
0
5000
6000
7000
8000
9000
10000
Reverse Voltage (mV)

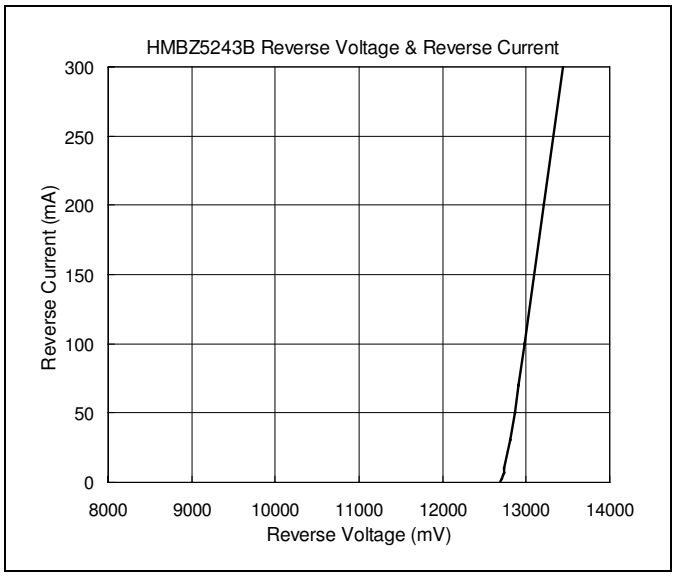

HMBZ5241B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

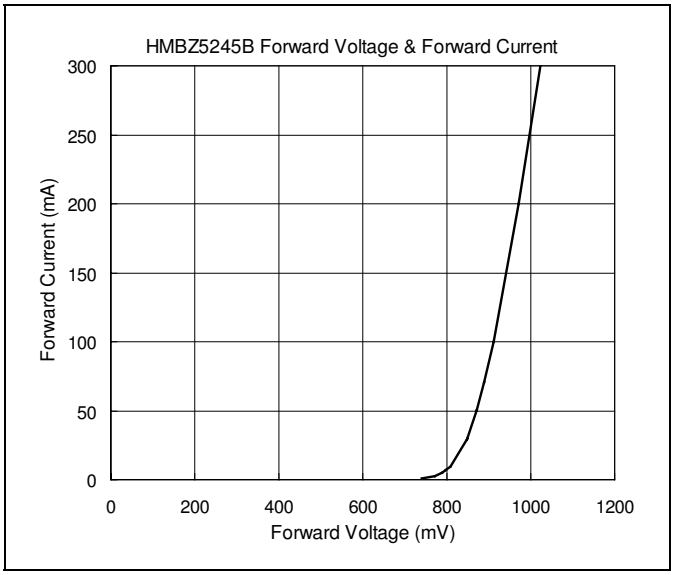

HMBZ5241B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
6000
7000
8000
9000
10000
11000
Revese Voltage (mV)

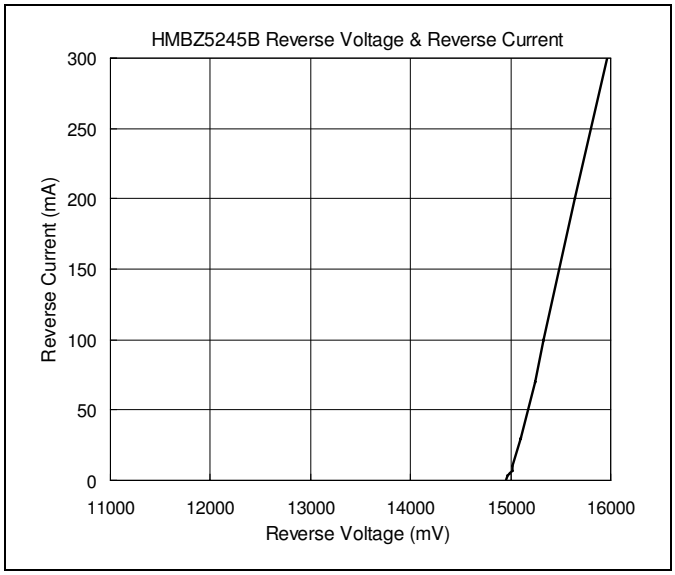

HMBZ5242B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

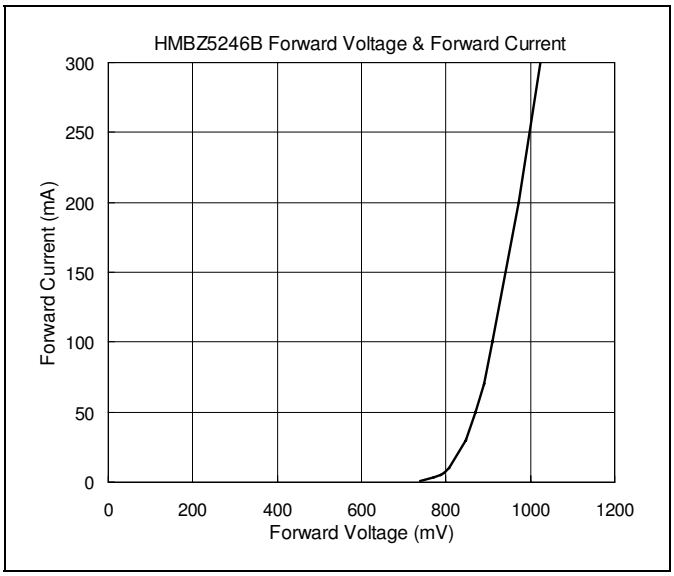

HMBZ5242B Reverse Voltage & Reverse Current
Reverse Current (mA)
300
250
200
150
100
50
0
11500
11600
11700
11800
11900
12000
12100
12200
12300
Reverse Voltage (mV)

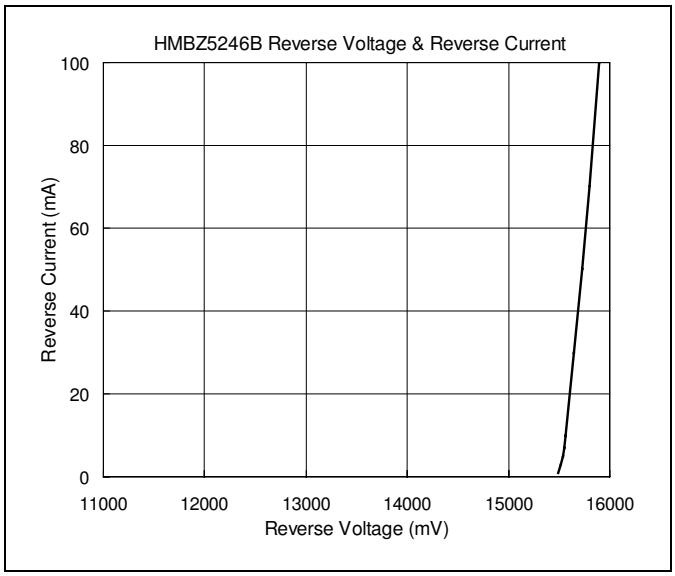

HMBZ5243B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

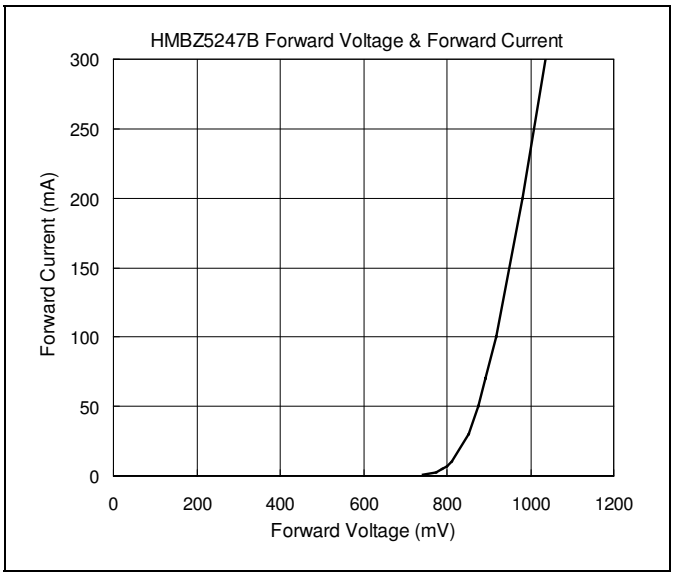

HMBZ5243B Reverse Voltage & Reverse Current
Reverse Current (mA)
300
250
200
150
100
50
0
8000
9000
10000
11000
12000
13000
14000
Reverse Voltage (mV)

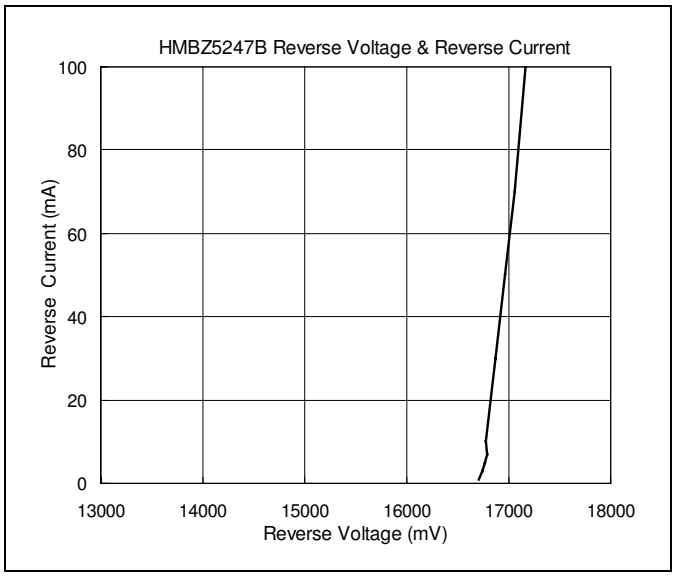

HMBZ5245B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

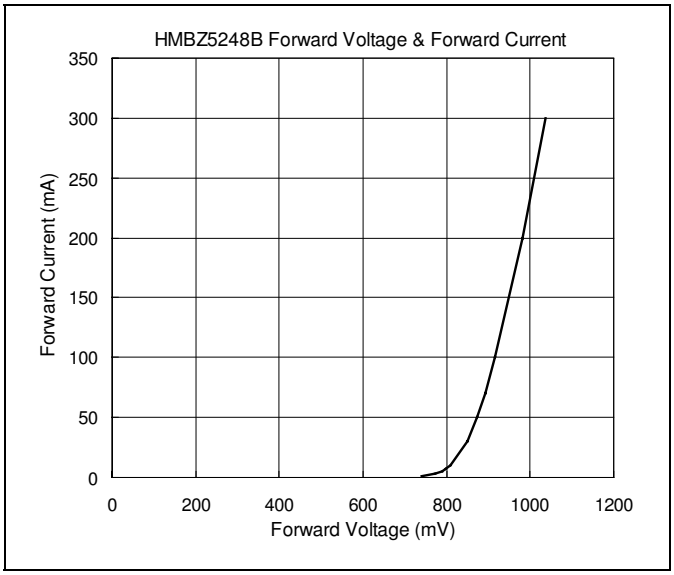

HMBZ5245B Reverse Voltage & Reverse Current
Reverse Current (mA)
300
250
200
150
100
50
0
11000
12000
13000
14000
15000
16000
Reverse Voltage (mV)

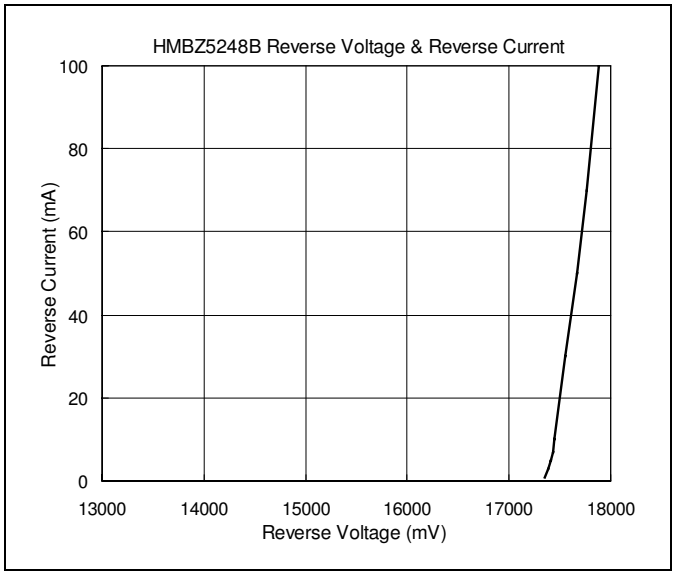

HMBZ5246B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

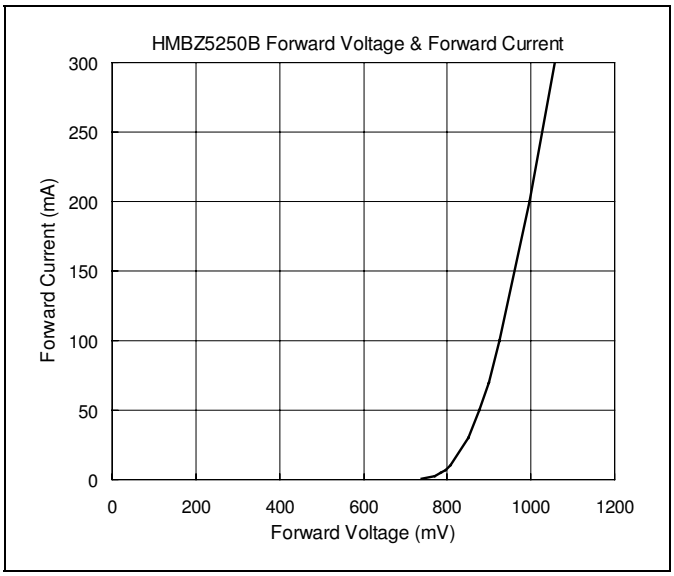

HMBZ5246B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
11000
12000
13000
14000
15000
16000
Reverse Voltage (mV)

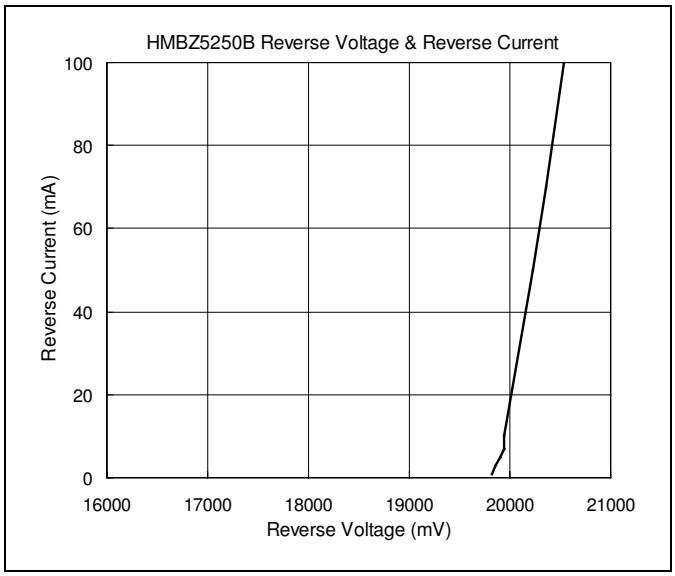

HMBZ5247B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

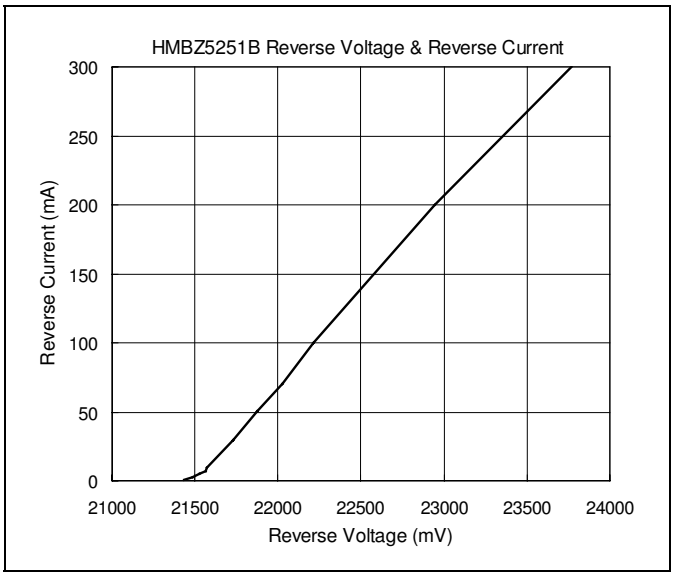

HMBZ5247B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
13000
14000
15000
16000
17000
18000
Reverse Voltage (mV)

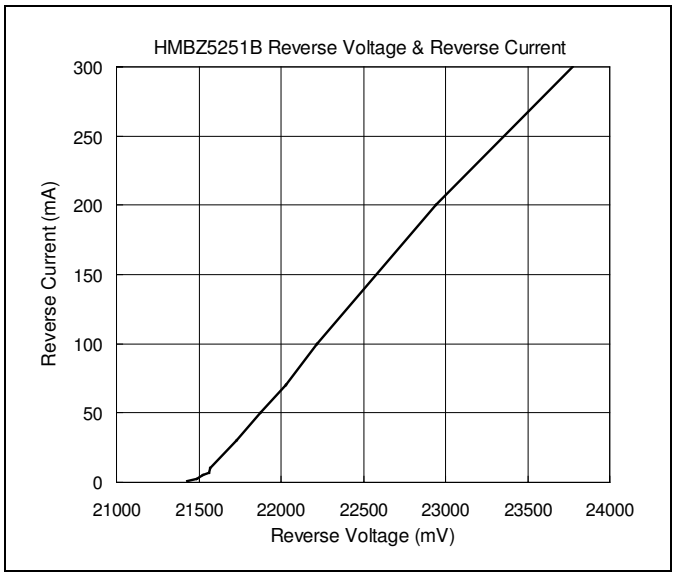

HMBZ5248B Forward Voltage & Forward Current
Forward Current (mA)
350
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

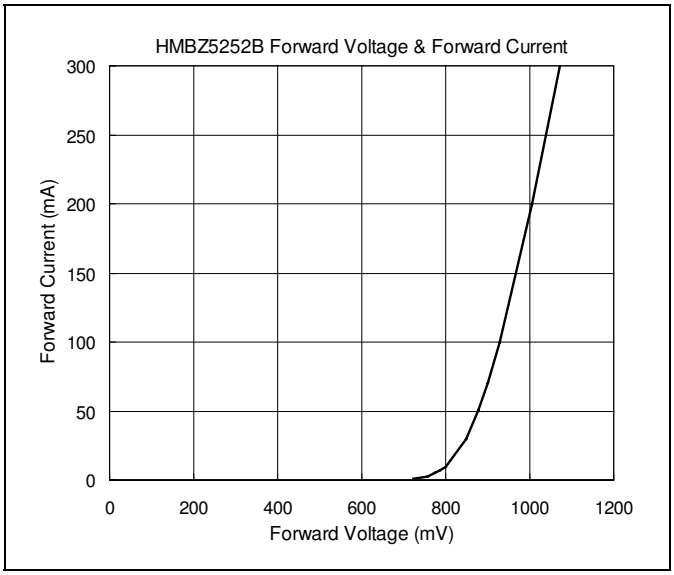

HMBZ5248B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
13000
14000
15000
16000
17000
18000
Reverse Voltage (mV)

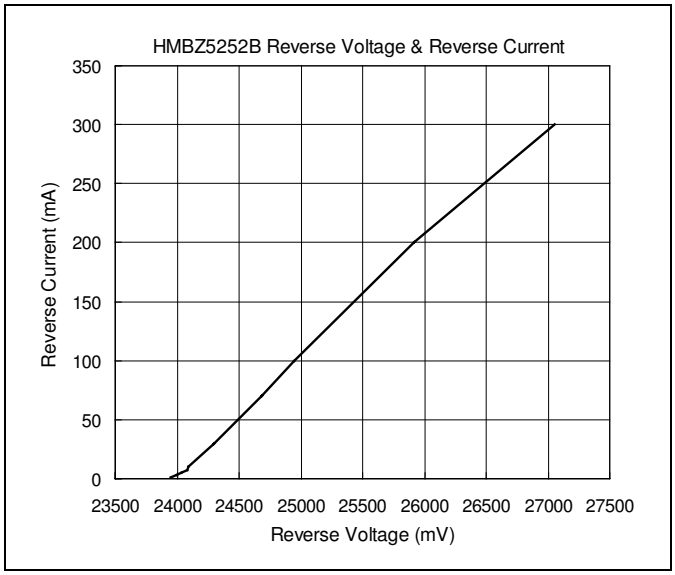

HMBZ5250B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

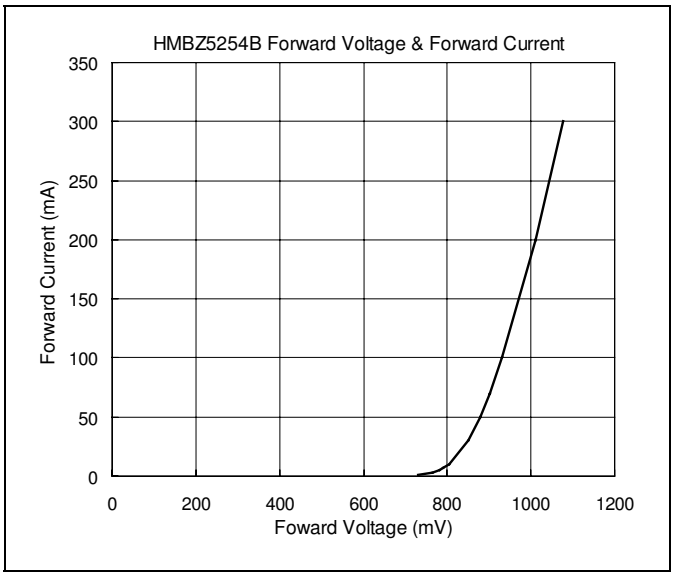

HMBZ5250B Reverse Voltage & Reverse Current
Reverse Current (mA)
100
80
60
40
20
0
16000
17000
18000
19000
20000
21000
Reverse Voltage (mV)

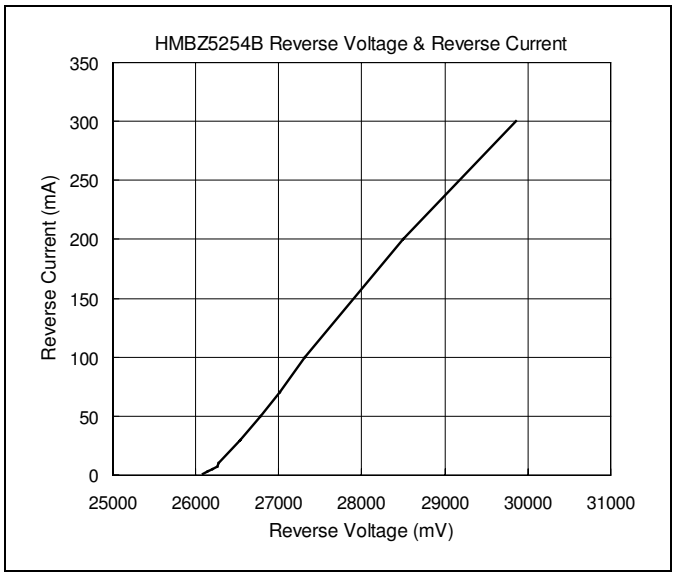

HMBZ5251B Reverse Voltage & Reverse Current
Reverse Current (mA)
300
250
200
150
100
50
0
21000
21500
22000
22500
23000
23500
24000
Reverse Voltage (mV)

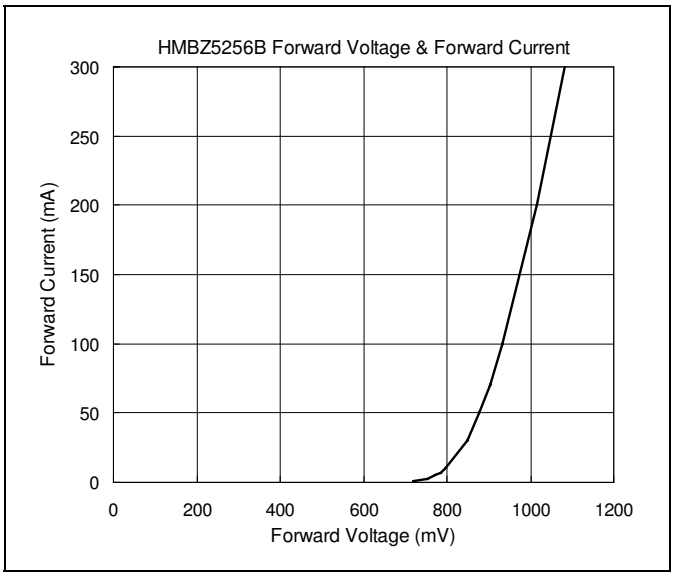

HMBZ5251B Reverse Voltage & Reverse Current
Reverse Current (mA)
300
250
200
150
100
50
0
21000
21500
22000
22500
23000
23500
24000
Reverse Voltage (mV)

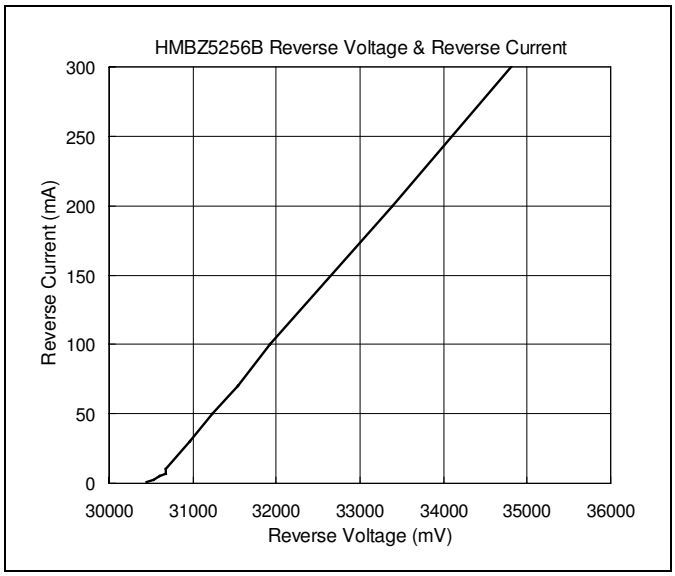

HMBZ5252B Forward Voltage & Forward Current
Forward Current (mA)
300
250
200
150
100
50
0
0
200
400
600
800
1000
1200
Forward Voltage (mV)

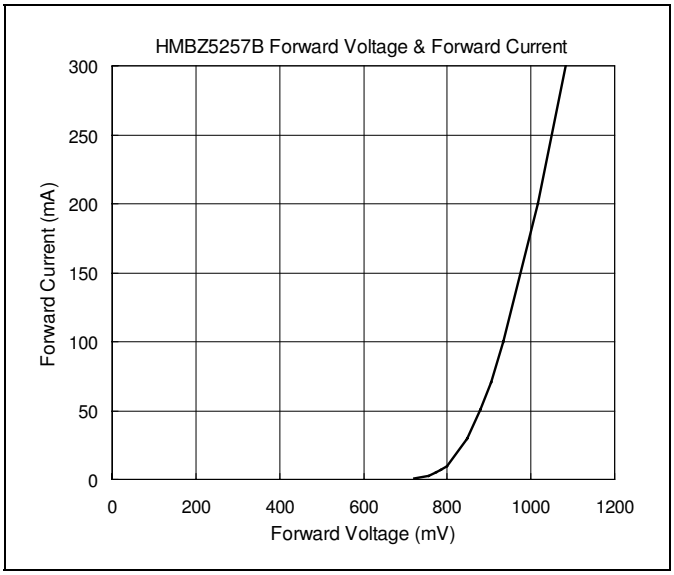

HMBZ5252B Reverse Voltage & Reverse Current
Reverse Current (mA)
350
300
250
200
150
100
50
0
23500
24000
24500
25000
25500
26000
26500
27000
27500
Reverse Voltage (mV)

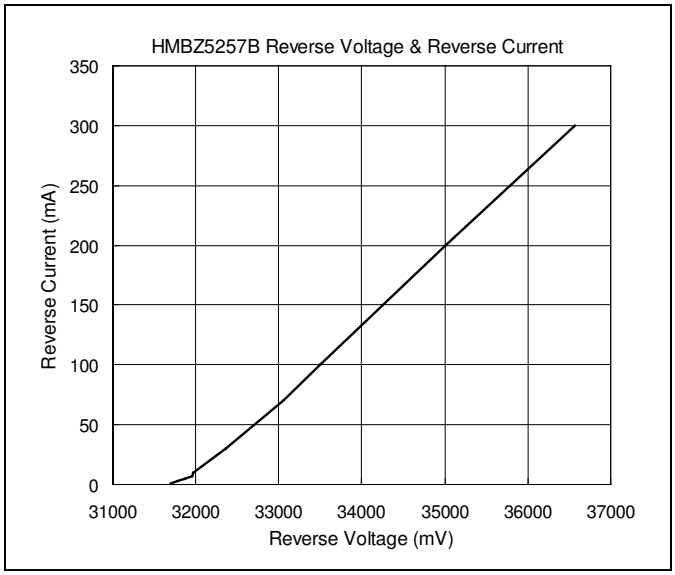

HMBZ5254B Forward Voltage & Forward Current
Forward Current (mA)
0
50
100
150
200
250
300
350
0
200
400
600
800
1000
1200
Foward Voltage (mV)


HMBZ5254B Reverse Voltage & Reverse Current
Reverse Current (mA)
0
50
100
150
200
250
300
350
25000
26000
27000
28000
29000
30000
31000
Reverse Voltage (mV)

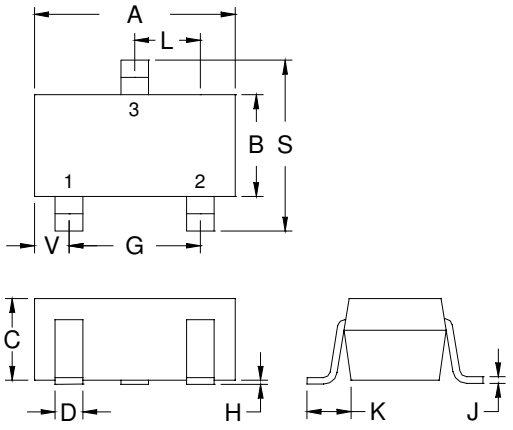

HMBZ5256B Forward Voltage & Forward Current
Forward Current (mA)
0
50
100
150
200
250
300
0
200
400
600
800
1000
1200
Forward Voltage (mV)


HMBZ5256B Reverse Voltage & Reverse Current
Reverse Current (mA)
0
50
100
150
200
250
300
30000
31000
32000
33000
34000
35000
36000
Reverse Voltage (mV)


HMBZ5257B Forward Voltage & Forward Current
Forward Current (mA)
0
50
100
150
200
250
300
0
200
400
600
800
1000
1200
Forward Voltage (mV)


HMBZ5257B Reverse Voltage & Reverse Current
Reverse Current (mA)
0
50
100
150
200
250
300
350
31000
32000
33000
34000
35000
36000
37000
Reverse Voltage (mV)

SOT-23 Dimension



3-Lead SOT-23 Plastic
Surface Mounted Package
HSMC Package Code: N

Marking:

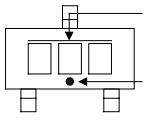
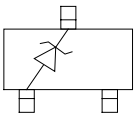


Diagram:



Note: Pb-free product can distinguish by the green label or the extra description on the right side of the label.

Pin Style: 1.Anode 2.NC 3.Cathode

Material:
- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

DIM	Min.	Max.
A	2.80	3.04
B	1.20	1.60
C	0.89	1.30
D	0.30	0.50
G	1.70	2.30
H	0.013	0.10
J	0.085	0.177
K	0.32	0.67
L	0.85	1.15
S	2.10	2.75
V	0.25	0.65

*: Typical, Unit: mm

Head Office And Factory:

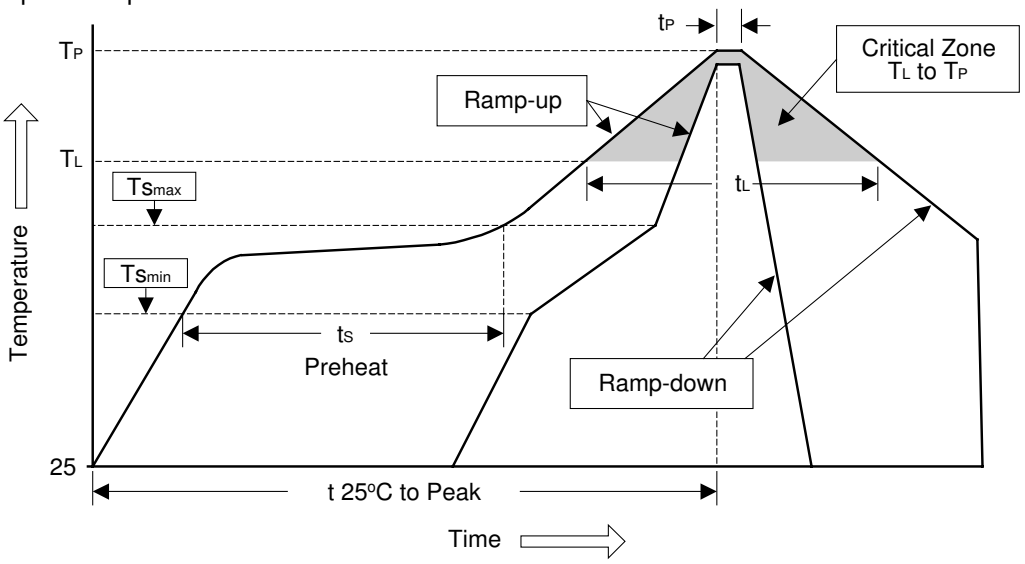
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F.,No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
  Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

Soldering Methods for HSMC's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%

2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat - Temperature Min (Ts_{min}) - Temperature Max (Ts_{max}) - Time (min to max) (ts)	 100°C 150°C 60~120 sec	 150°C 200°C 60~180 sec
Tsmax to T_L - Ramp-up Rate	 <3°C/sec	 <3°C/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60~150 sec	 217°C 60~150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10~30 sec	20~40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak temperature	Dipping time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec