

A NEW DIODE & ALL YOU NEED TO KNOW ABOUT IT.

Is your testing anywhere near OEM test standards?
Please read the following as it is much different from all you have read before.

We have all been reading about diodes for years, but here you will get all the information you have wanted, thanks to Peter Bain, (President of Rand Premium Electronics).

Here is the cost of making and testing a new diode:

Production Equipment	\$860,000.00
Production Reliability Equipment	\$300,000.00
Production Analyzing Equipment	\$250,000.00
Environment Equipment	\$150,000.00
Total	\$1,560,000.00

Test Equipment Only \$550,000.00

One of the biggest changes is Leakage Current. The tester you use now probably reads in Prefix Milli, Symbol (m), and many of the old testers do not even get that accurate. Everyone should be reading Microamp.

Reading Definitions:

Prefix	Symbol	10n	Decimal	How Old.
Milli	m	10-3	0.001	First available diodes
Micro	u	10-6	0.000001	Now...the more zeros behind the decimal the better for quality and finding weak diodes

Part #51.2050.1-8 (Neg)

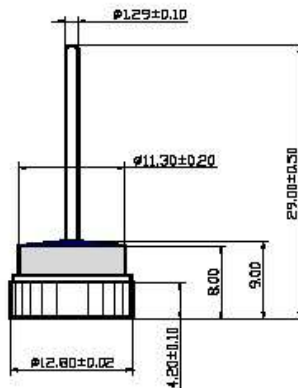
Part# 51.2050.2-8 (Pos)

Features:

- Average Forward Current 50A
- Breakdown voltage $\geq 300V$
- One-time OJ welding process
- Cu-Cup. Epoxy Potting
- Low leakage current
- Cost-effective

Mechanical Description:

- 8mm plastic ring pressure shell-in
- Identification:
Brown plastic ring Positive (P)
Black plastic ring Negative (N)
- Weight: 6g



Unit: mm

Rating:

Type	Average Forward Current (I _F)	Repeat peak reverse voltage (V _{RRM})	The maximum junction temperature (T _{JM})	Rated shell temperature (T _C)	Forward surge current of non-repetition (I _{FSM})	Storage temperature (T _{SM})	
P	N	A	V	°C	°C	°C	
51.2050.2-8	51.2050.1-8	50	300	215	-40~190	600	-40~200

Electricity, thermal characteristic T_C=25°C (Unless otherwise specified)

Type	Forward peak value Voltage (V _{FM})	Reverse repeat peak value Current (I _{RRM})	Reverse repeat peak value Current (I _{RRM})	Thermal Resistance R _{th(j-c)}	
P	N	V	µA	°C/W	
		(I _{FM} =100A)	(V _{FM} =V _{RRM})	(V _{FM} =400V, T _C =125°C)	
51.2050.2-8	51.2050.1-8	≤1.05	1	100	≤0.6

NO.	Item	Condition & Request
1	Electrical characteristics	①Forward peak voltage VFM \leq 1.07V (IFM=100A) ②Reverse peak current IRRM1 \leq 0.2uA (VR=20V) ③Reverse peak current IRRM2 \leq 100uA (VR=16V, TC=195 $^{\circ}$ C), IRRM1 \leq 0.2uA ④Avalanche hit Voltage VBR: 24~28V (IRM=100mA) ⑤Reverse not redundant surge current Test conditions: Test condition: Shell temperature TC=25 $^{\circ}$ C; IRM=185%11 time tP=10ms After the test: IRRM1 \leq 0.4uA (VR =20V)
2	Appearance Test	a) Appearance The positive and negative polarity should be consistent with the tube socket on polar phase, in the tube socket the packing ring oxygen free fat seal does not have the air bubble, between the epoxy resin and the plastic link does not have the crack, the component should the non-outward appearance distort, the coating luster should be even. Does not have the skin. Bubbles the rust spot phenomenon. b) Dimensions Φ b(mm) :1.25~1.4, Φ D (mm) :12.78~12.82
3	Heat exchange reverse bias	Test conditions: frequency f is dizzy wave 50HZ TA = (195 \pm 5) $^{\circ}$ C test time :60h After the test: VFM \leq 1.1V (IFM = 100A), IRRM \leq 0.4uA (VR = 20V)
4	Thermal load cycling test conditions	Shell temperature: T1 = 30 - 190 $^{\circ}$ C conversion time: T = 2-5 min Output current: I1 = 60% I0 cycles: 10000 times After the test: VFM \leq 1.1V (IFM = 100A), IRRM \leq 0.4uA (VR = 20V)

NO.	Item	Condition & Request
5	High Temperature Storage	Storage temperature: 200 $^{\circ}$ C storage time: 168h recovery time: \approx 2h After the test: VFM \leq 1.1V (IFM = 100A), IRRM \leq 0.4uA (VR = 20V)
6	Low Temperature Storage	Storage temperature: -40 +20 $^{\circ}$ C storage time: 168h recovery time: \approx 2h After the test: VFM \leq 1.1V (IFM = 100A), IRRM \leq 0.4uA (VR = 20V)
7	high pressure braise	pressure = 15Pa, temperature = 121 $^{\circ}$ C, Time = 96h After the test: VFM \leq 1.1V (IFM = 100A), IRRM \leq 0.4uA (VR = 20V)
8	damp heat test	Temperature Tc=85 $^{\circ}$ C; humidity=85%RH After the test: VFM \leq 1.1V (IFM = 100A), IRRM \leq 0.4uA (VR = 20V)
9	thermal shock (liquid-liquid)	Temperature 0 $^{\circ}$ C -100 $^{\circ}$ C Time: 5min (conversion time for the 10S) Views: 100 times After the test: VFM \leq 1.1V (IFM = 100A), IRRM \leq 0.4uA (VR = 20V)
10	Temperature changes	Test conditions: low temperature TA: (-40 +2) $^{\circ}$ C temperature TB: (175-2) $^{\circ}$ C exposure time: 15min transfer time: \approx 2min Cycles: 150 Recovery Time: \approx 2h After the test: the device should be no appearance of deformation, coating color to be uniform. Free from skin. Blistering rusty spot phenomenon. Tube socket filled epoxy resin sealed in bubble-free, epoxy resin and the plastic ring between the crack-free. VFM \leq 1.1V (IFM = 100A), IRRM \leq 0.4uA (VR = 20V)
11	Solderability Test	Temperature: (350 \pm 10) $^{\circ}$ C Time: 3.5S \pm 0.5S After the test: wetting \approx 95%
12	Resistance to soldering heat test	infiltration time (10 \pm 1) S Soldering temperature (260 \pm 5) $^{\circ}$ C, immersed depth (10 \pm 5) mm After the test: VFM \leq 1.1V (IFM = 100A), IRRM \leq 0.4uA (VR = 20V)
13	Vibration (sine wave)	Test conditions: sweep duration of 10 min After the test: VFM \leq 1.1V (IFM = 100A), IRRM \leq 0.4uA (VR = 20V)
14	Lead strength (tensile) test	F = 4N maintained (10 \pm 1) S After the test: leads to side not appear broken, loose, displacement.

4. Test performed on incoming Dies (chips)

- 1 Leakage Current Test
- 2 Reverse Voltage Test
- 3 Reverse Breakdown Curve Test(Delta-Vr)
- 4 Avalanche Voltage Test
- 5 Forward Voltage Test
- 6 Delta-Vf Test
- 7 Dynamic Resistance Test

5. On line tests on each diode during production

- 1 Leakage Current Test-**MICRO AMPS**
- 2 Reverse Voltage Test
- 3 Avalanche Voltage Test
- 4 Forward Voltage Test

6. What does your diode tester read compared to OEM?

How many amps are going through the diode under test?
Are you reading voltage junction drop and if so at what voltage?
Are you reading Milli or MICRO amps for leakage?
You should be reading MICRO amps if you aren't.

Once again thanks you to Peter at Rand Premium Electronics for all the data and help.

Make sure you can back up what you say about your diodes compared to OEM.

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