SunLED
www.SunLEDusa.com

Part Number: XZMDKCBDDG45S-9
What a mouthful.
3.2x2.8mm PLCC4 SMD LED

Features

- Ideal for indication light on hand held products
- Long life and robust package
- Standard Package: 2000pcs/ Reel
- MSL (Moisture Sensitivity Level): 3
- Halogen-free
- RoHS compliant.

Perfect First Page

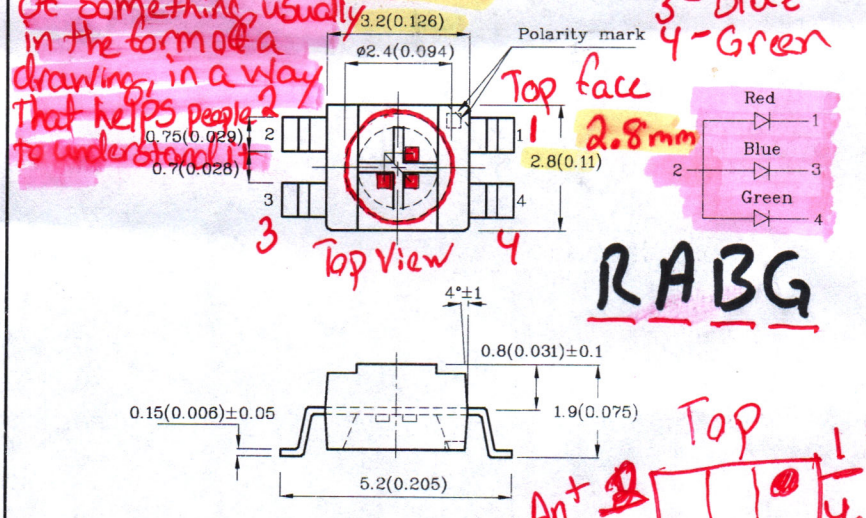
ATTENTION
OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC DISCHARGE SENSITIVE DEVICES

JEDEC: Joint Electron Device Engineering Council
Originally JETEC: Joint Electron Tube Engineering Council. (see JEP-95)

Package Schematics

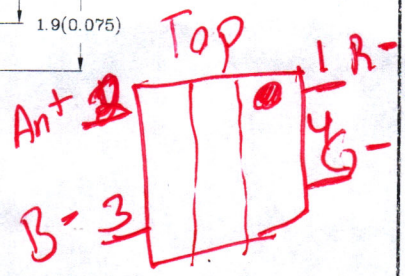
Showing the main form and features of something usually in the form of a drawing, in a way that helps people to understand it

3.2mm



1 - Red
2 - Anode
3 - Blue
4 - Green

RABG



Notes:
1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.2(0.008") unless otherwise noted.
3. Specifications are subject to change without notice.

Absolute Maximum Ratings (T_A=25°C)		Red (AlGaInP)	Blue (InGaN)	Green (InGaN)	Unit
Reverse Voltage	V_R	5	5	5	V
Forward Current	I_F	30	30	30	mA
Forward Current (Peak) 1/10 Duty Cycle 0.1ms Pulse Width	i_{FS}	185	150	150	mA
Power Dissipation	P_D	75	120	123	mW
Electrostatic Discharge Threshold (HBM)		3000	250	450	V
Operating Temperature	T_A	-40 ~ +85			°C
Storage Temperature	Tstg				

20%

A Relative Humidity between 40% and 60% is recommended in ESD-protected work areas to reduce static build up during assembly process (Reference JEDEC/JESD625-A and JEDEC/J-STD-033)

PN Junctions Intrinsic Capacitance has an effect on how quickly the PN junction reacts. Essentially creates a RC Circuit.

Operating Characteristics (T_A=25°C)		Red (AlGaInP)	Blue (InGaN)	Green (InGaN)	Unit
Forward Voltage (Typ.) (I_F=20mA)	V_F	1.95	3.3	3.3	V
Forward Voltage (Max.) (I_F=20mA)	V_F	2.5	4	4.1	V
Reverse Current (Max.) (V_R=5V)	I_R	10	50	50	μA
Wavelength of Peak Emission CIE127-2007* (Typ.) (I_F=20mA)	λP	645*	460*	515*	nm
Wavelength of Dominant Emission CIE127-2007* (Typ.) (I_F=20mA)	λD	630*	465*	525*	nm
Spectral Line Full Width At Half-Maximum (Typ.) (I_F=20mA)	△λ	28	25	35	nm
Capacitance (Typ.) (V_F=0V, f=1MHz)	C	35	100	45	pF

These are the important Specs

Part Number	Emitting Color	Emitting Material	Lens-color	Luminous Intensity CIE127-2007* (I_F=20mA) mcd min.	Luminous Intensity CIE127-2007* (I_F=20mA) mcd typ.	Wavelength CIE127-2007* λP nm	Viewing Angle 2θ 1/2
XZMDKCBDDG45S-9	Red	AlGaInP	Water Clear	55*	108*	645*	120°
	Blue	InGaN		55*	98*	460*	
	Green	InGaN		400*	497*	515*	

Aluminium Gallium Indium phosphide

Indium Gallium Nitride

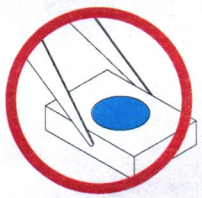
*Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

2nd Edition
La Commission Internationale De L'eclairage: Measurement of LEDs

Handling Precautions

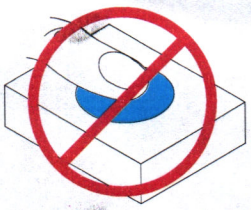
Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force.
As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

1. Handle the component along the side surfaces by using forceps or appropriate tools.

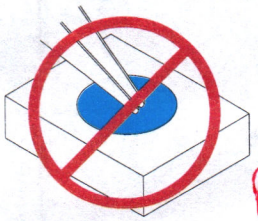


Nice.

2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.

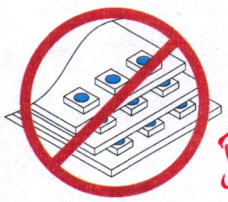


✓



Right.

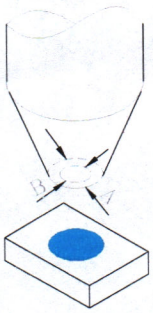
3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



Right.
Don't see this warning often

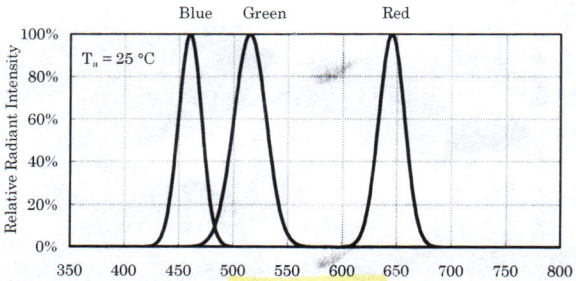
4.1. The inner diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks.
4.2. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup.
4.3. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production.

White Space management Good info. Good drawings Alot of potential.



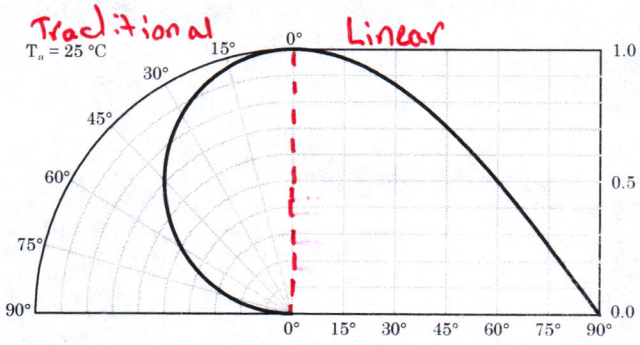
5. As silicone encapsulation is permeable to gases, some corrosive substances such as H_2S might corrode silver plating of leadframe. Special care should be taken if an LED with silicone encapsulation is to be used near such substances.

2



Relative Intensity Vs. CIE Wavelength

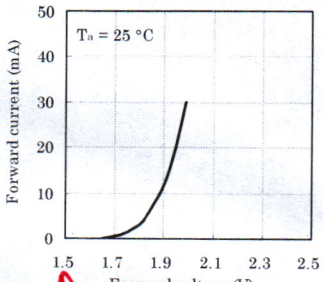
Traditional



Spatial Distribution

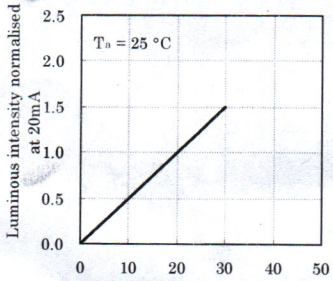
Two charts with the same dataset

❖ Red

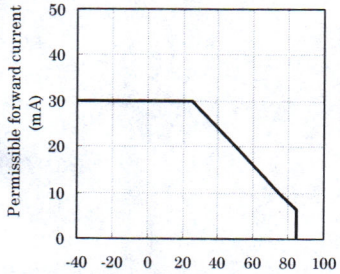


Forward Current vs. Forward Voltage

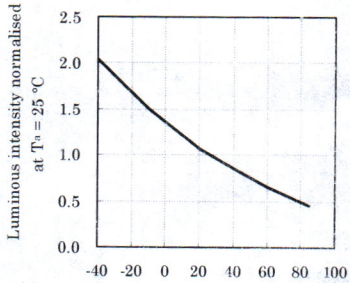
Different Range than Blue & Green



Luminous Intensity vs. Forward Current



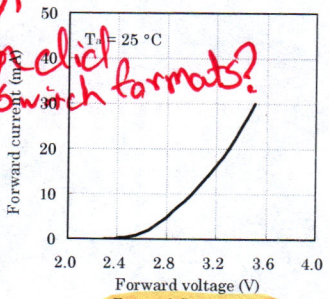
Forward Current Derating Curve



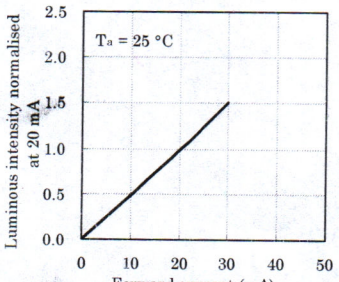
Luminous Intensity vs. Ambient Temperature

❖ Blue

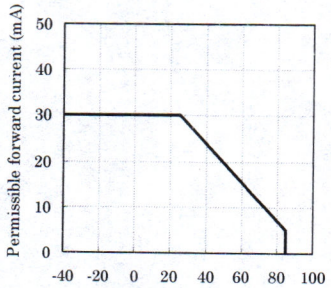
When click We switch formats?



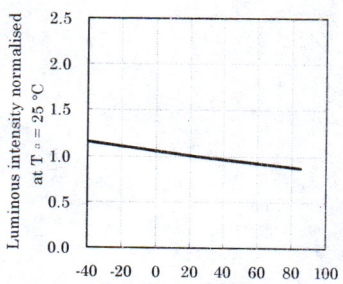
Forward Current vs. Forward Voltage



Luminous Intensity vs. Forward Current

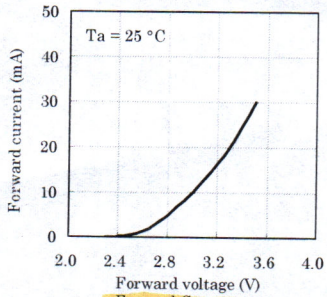


Forward Current Derating Curve

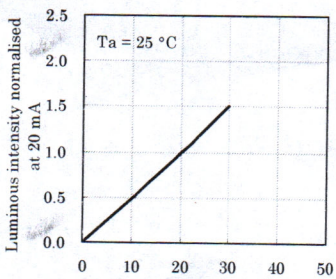


Luminous Intensity vs. Ambient Temperature

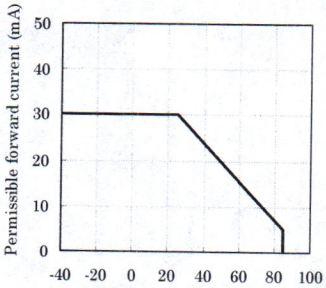
❖ Green



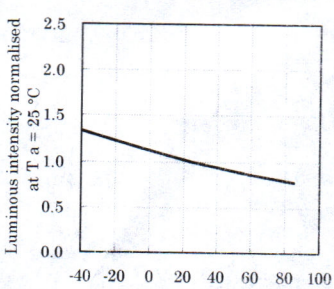
Forward Current vs. Forward Voltage



Luminous Intensity vs. Forward Current



Forward Current Derating Curve



Luminous Intensity vs. Ambient Temperature

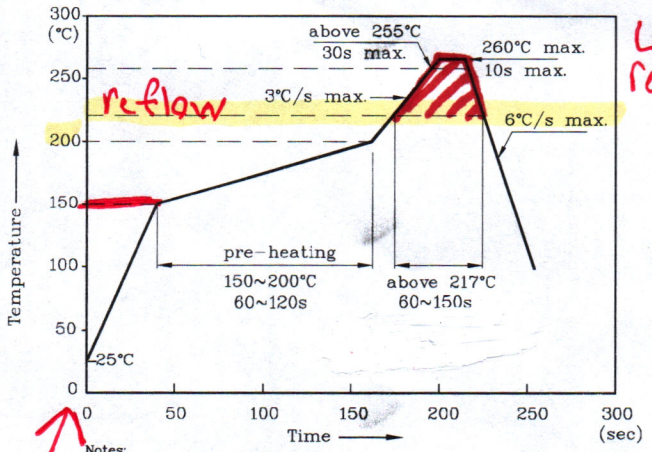
3

LED is recommended for reflow soldering and soldering profile is shown below.

Thermal Profile

First one I've done on Show, so far.

Reflow Soldering Profile for SMD Products (Pb-Free Components)



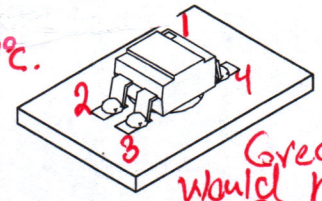
Notes:
1. All temperatures refer to the center of the package, measured on the package body surface facing up during reflow.
2. Do not apply any stress to the LED during high temperature conditions.
3. Maximum number of soldering passes: 2

Loctite GC10 reflows at 217°C.

Generic drawing/art.

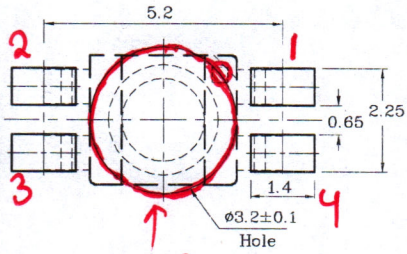
Formatting

❖ **The device has a single mounting surface. The device must be mounted according to the specifications.**



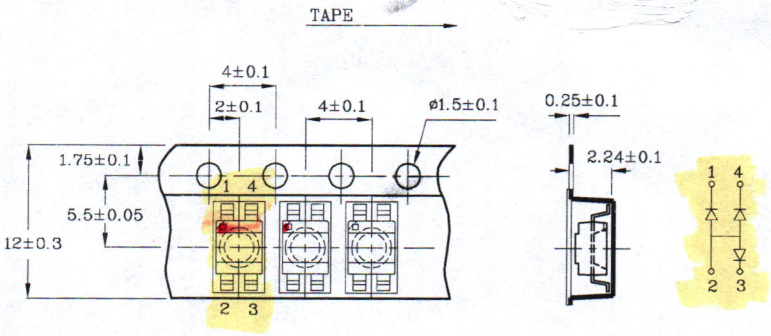
Great Drawing would have been good on page 1.

❖ **Recommended Soldering Pattern (Units : mm; Tolerance: ± 0.1)**

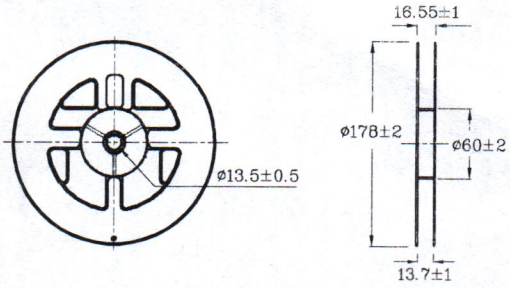


Ø3.2 mm hole or Soldermask

❖ **Tape Specification (Units : mm)**



❖ **Reel Dimension (Units : mm)**



Remarks:

If special sorting is required (e.g. binning based on forward voltage, Luminous intensity / luminous flux, or wavelength), the typical accuracy of the sorting process is as follows:

1. Wavelength: +/-1nm
2. Luminous intensity / luminous flux: +/-15%
3. Forward Voltage: +/-0.1V

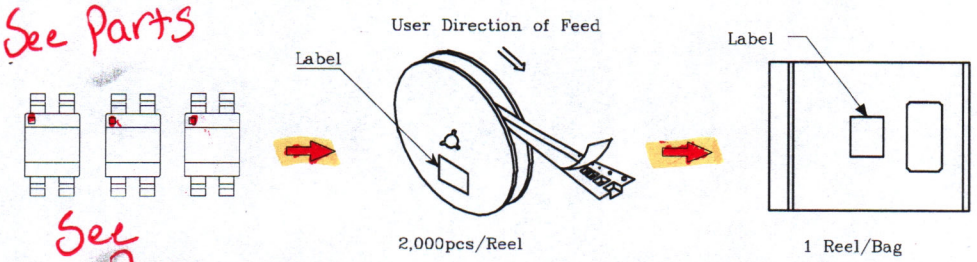
Note: Accuracy may depend on the sorting parameters.

Tolerances!

4

PACKING & LABEL SPECIFICATIONS

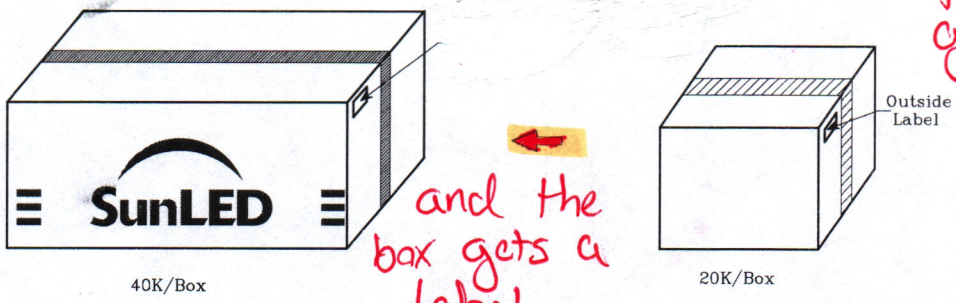
See Parts



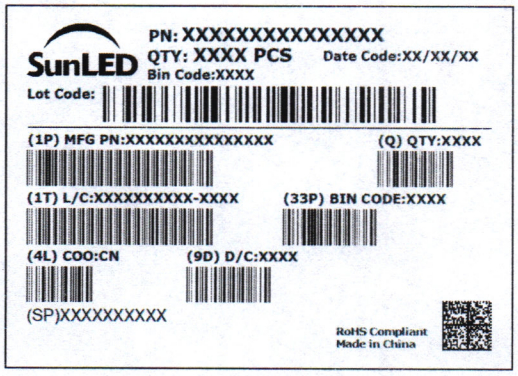
See Parts
Rotate the part 90°

go on Tape & Reel. That goes in a Bag

and that goes in a box.



and the box gets a Label



Nice.

TERMS OF USE

1. Data presented in this document reflect statistical figures and should be treated as technical reference only.
2. Contents within this document are subject to improvement and enhancement changes without notice.
3. The product(s) in this document are designed to be operated within the electrical and environmental specifications indicated on the datasheet. User accepts full risk and responsibility when operating the product(s) beyond their intended specifications.
4. The product(s) described in this document are intended for electronic applications in which a person's life is not reliant upon the LED. Please consult with a SunLED representative for special applications where the LED may have a direct impact on a person's life.
5. The contents within this document may not be altered without prior consent by SunLED.
6. Additional technical notes are available at https://www.SunLEDusa.com/TechnicalNotes.asp

Hyper Link ↑↑↑

5

Datasheet Evaluation and Analysis Report

Part Number:	XZMDKCBDDG455-9	**Manufacturer:**	Sun LED
Datasheet Revision:	V11-2 ?	**Date Published:**	Nov 26, 2020
Datasheet Source:	Digi Key	**Date Sourced:**	[redacted]
Evaluated By:	David Ray	**Final Score:**	363 /555 Points
Additional Notes:			

RGB Reverse Mount LED

1. Presentation and Accessibility (75 points)	
- Language (10 points)	8
- Readability (10 points)	10
- Availability (10 points)	10 on digikey listing
- Ease of Access (10 points)	10
- Content-Length Efficiency (5 points)	4
- Mobile Compatibility (5 points)	4
- Hyperlinks (10 points)	8- single link at end of page 5. No needs otherwise
- Searchability (10 points)	10
- Consistent Formatting (5 points)	2 All over the place.
Score: Section 1 (75 points)	66 /75
Section Notes:	

2. Organization and Layout (60 points)	
- Table of Contents and Navigation (10 points)	0
- Clarity of Information (10 points)	7 Spatial Distribution & Pin 1
- Use of Graphics (10 points)	6
- Data Sheet Structure (10 points)	8
- Consistent Terminology (10 points)	10
- Section Headings (5 points)	3
- Subsection Headings (5 points)	0
Score: Section 2 (60 points)	36
Section Notes:	

Datasheet Evaluation and Analysis Report

3. Electrical Characteristics (90 points)	
- Absolute Maximum Ratings (10 points)	10
- Recommended Operating Conditions (10 points)	~~9~~ 10
- Electrical Characteristics (10 points)	10
- Dynamic Characteristics (10 points)	0
- Thermal Characteristics (10 points)	9
- Noise Characteristics (10 points)	0
- Power Consumption (10 points)	10
- Accuracy and Precision (10 points)	10 CIE 127-2007
- Output Drive Capability (10 points)	10 Luminosity
Score: Section 3 (90 points)	69 out of 90 points
Section Notes:	

4. Functional Description (75 points)		
- Pin Configuration (10 points)	10	Page 1
- Pin Functions (10 points)	8	Page 1
- Function Tables (10 points)	10	Page 1
- Block Diagram (10 points)	0	
- Performance Diagrams (10 points)	10	
- Signal Descriptions (10 points)	~~6~~ 6	
- Input/Output Waveforms (5 points)	3	
- Functional Diagrams (5 points)	3	
Score: Section 4 (75 points)	50/75	
Section Notes:		

Part Number: X2MDKCBDDG455-9

Datasheet Evaluation and Analysis Report

5. Application Information (60 points)	
- Typical Applications (10 points)	7 Page 1: Hand held Products
- Circuit Description (10 points)	8
- PCB Footprint and Layout (10 points)	10 - outline of part on drawing
- Reference Designs (10 points)	0
- Application Notes (10 points)	0
- Component Selection Guidelines (5 points)	0
- Power Supply Recommendations (5 points)	2
Score: Section 5 (60 points)	27/60

Section Notes:

6. Quality and Reliability (75 points)	
- Quality Standards and Certifications (10 points)	10
- Reliability Information (10 points)	7
- Failure Rate Data (10 points)	2
- Test and Evaluation Procedures (10 points)	0
- Environmental Considerations (10 points)	10
- ESD Handling Precautions (10 points)	10
- MTBF Data (5 points)	0
- Burn-in and Screening Procedures (5 points)	0
- Life Cycle Status (5 points)	0
Score: Section 6 (75 points)	39/75

Section Notes:

7. Packaging and Handling (30 points)	
- Packaging Information (10 points)	10 Great drawings
- Handling Precautions (10 points)	10
- Storage and Shelf Life (5 points)	3
- Labeling and Marking (5 points)	5
Score: Section 7 (30 points)	28/30
Section Notes:	Great Job!

8. Support and Documentation (60 points)	
- Additional Documentation (10 points)	10
- Design Resources (10 points)	5
- Technical Support (10 points)	10
- Community Resources (10 points)	6
- Errata Sheets (5 points)	0
- Frequently Asked Questions (5 points)	3 other document
- Software Tools and Drivers (5 points)	0
- Application Examples (5 points)	0
Score: Section 8 (60 points)	34/60
Section Notes:	

9. Updates and Revision Control (30 points)	
- Revision History (15 points)	0
- Update Frequency (15 points)	0
Score: Section 9 (30 points)	0
Section Notes:	

Datasheet Evaluation and Analysis Report

10. Overall Impression (15 points)	
- Organization and Clarity (5 points)	4
- Completeness of Information (5 points)	5
- Relevance to Application (5 points)	5
Score: Section 10 (15 points)	14
Section Notes:	
Total Score: (555 points)	363 out of 5-5-5

Summary and Reflection:

Great datasheet. Decent layout accomplishes its mission very well.

Great Job Maggie L

Go to
www.CyberCityCircuits.com

Part Number: X2MDKCBDDG455-9