

QRE1113, QRE1113GR

Miniature Reflective Object Sensor

Features

- Phototransistor Output
- No Contact Surface Sensing
- Miniature Package
- Lead Form Style: Gull Wing
- Two Leadform Options:
 - ◆ Through Hole (QRE1113)
 - ◆ SMT Gull Wing (QRE1113GR)
- Two Packaging Options:
 - ◆ Tube (QRE1113)
 - ◆ Tape and Reel (QRE1113GR)

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
T _{OPR}	Operating Temperature	-40 to +85	°C
T _{STG}	Storage Temperature	-40 to +90	°C
T _{SOL-I}	Soldering Temperature (Iron) (Notes 2, 3, 4)	240 for 5 s	°C
T _{SOL-F}	Soldering Temperature (Flow) (Notes 3, 4)	260 for 10 s	°C

EMITTER

I _F	Continuous Forward Current	50	mA
V _R	Reverse Voltage	5	V
I _{FP}	Peak Forward Current (Note 5)	1	A
P _D	Power Dissipation (Note 1)	75	mW

SENSOR

V _{CEO}	Collector-Emitter Voltage	30	V
V _{ECO}	Emitter-Collector Voltage	5	V
I _C	Collector Current	20	mA
P _D	Power Dissipation (Note 1)	50	mW

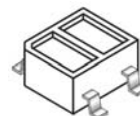
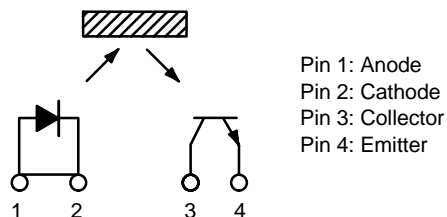
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Derate power dissipation linearly 1.00 mW/°C above 25°C.
2. RMA flux is recommended.
3. Methanol or isopropyl alcohols are recommended as cleaning agents.
4. Soldering iron 1/16" (1.6 mm) from housing.
5. Pulse conditions: t_p = 100 μs; T = 10 ms.

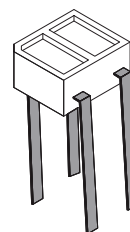


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REFLECTIVE RECTANGULAR SURFACE MOUNT CASE 100CY



REFLECTIVE RECTANGULAR THROUGH HOLE CASE 100AQ

ORDERING INFORMATION

Device	Package	Shipping [†]
QRE1113	Reflective Rectangular (Through Hole)	1600 / Tube
QRE1113GR	Reflective Rectangular (Surface Mount)	1000 / Tape & Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

QRE1113, QRE1113GR

ELECTRICAL/OPTICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
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INPUT DIODE

V_F	Forward Voltage	$I_F = 20\text{ mA}$		1.2	1.6	V
I_R	Reverse Leakage Current	$V_R = 5\text{ V}$			10	μA
λ_{PE}	Peak Emission Wavelength	$I_F = 20\text{ mA}$		940		nm

OUTPUT TRANSISTOR

I_D	Collector-Emitter Dark Current	$I_F = 0\text{ mA}, V_{CE} = 20\text{ V}$			100	nA
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COUPLED

$I_{C(ON)}$	On-State Collector Current	$I_F = 20\text{ mA}, V_{CE} = 5\text{ V}$ (Note 6)	0.10	0.90		mA
I_{CX}	Cross-Talk Collector Current	$I_F = 20\text{ mA}, V_{CE} = 5\text{ V}$ (Note 7)			1	μA
$V_{CE(SAT)}$	Saturation Voltage				0.3	V
t_r	Rise Time	$V_{CC} = 5\text{ V}, I_{C(ON)} = 100\ \mu\text{A}, R_L = 100\ \text{k}\Omega$		20		μs
t_f	Fall Time			20		μs

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

6. Measured using an aluminum alloy mirror at $d = 1\text{ mm}$.

7. No reflective surface at close proximity.

REFLOW PROFILE

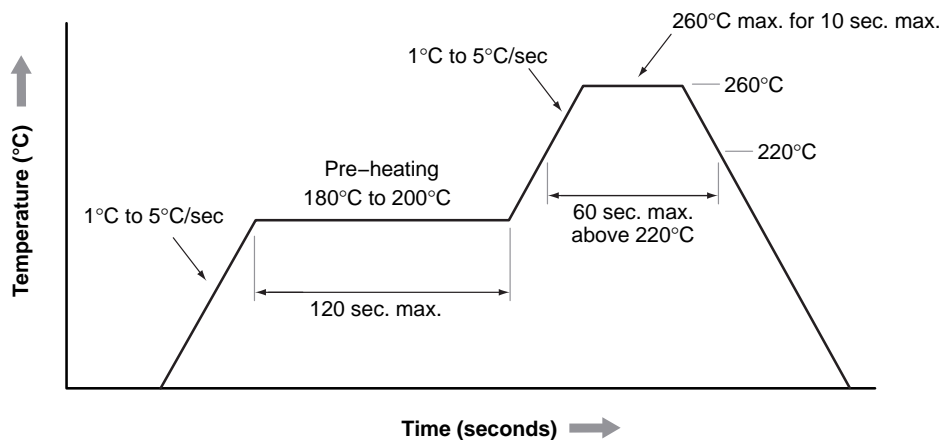


Figure 1. Reflow Profile

TYPICAL PERFORMANCE CURVES

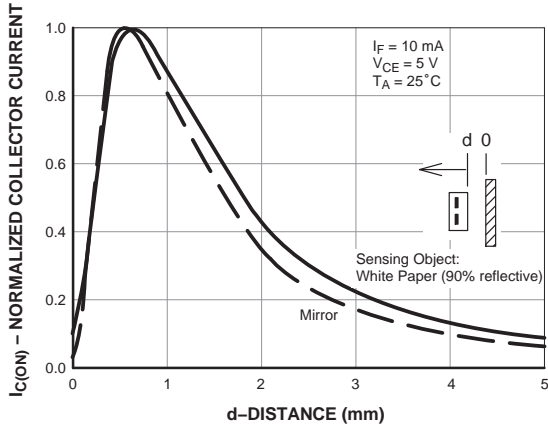


Figure 2. Normalized Collector Current vs. Distance between Device and Reflector

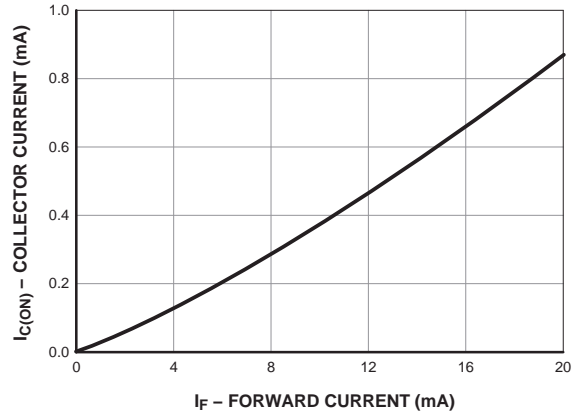


Figure 3. Collector Current vs. Forward Current

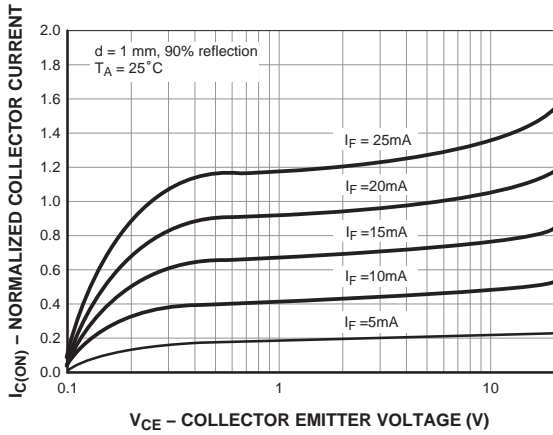


Figure 4. Normalized Collector Current vs. Collector to Emitter Voltage

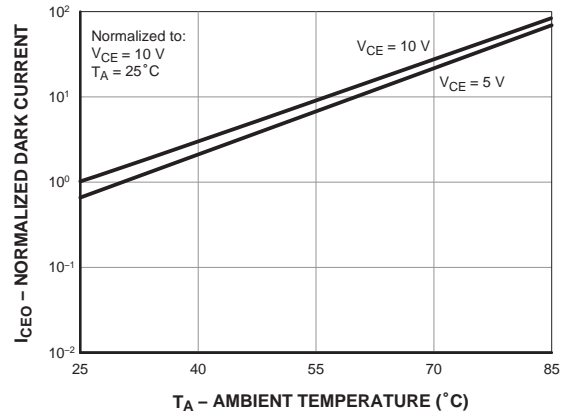


Figure 5. Collector Emitter Dark Current (Normalized) vs. Ambient Temperature

QRE1113, QRE1113GR

TYPICAL PERFORMANCE CURVES (Continued)

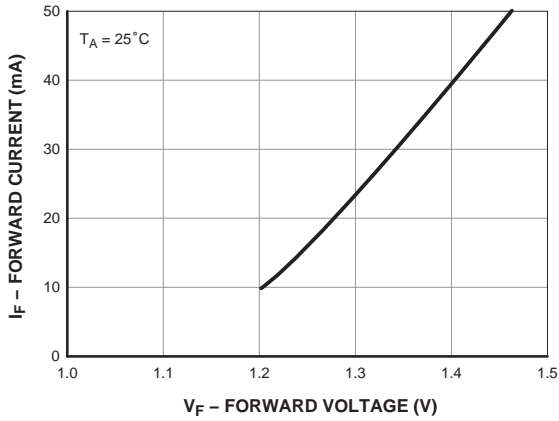


Figure 6. Forward Current vs. Forward Voltage

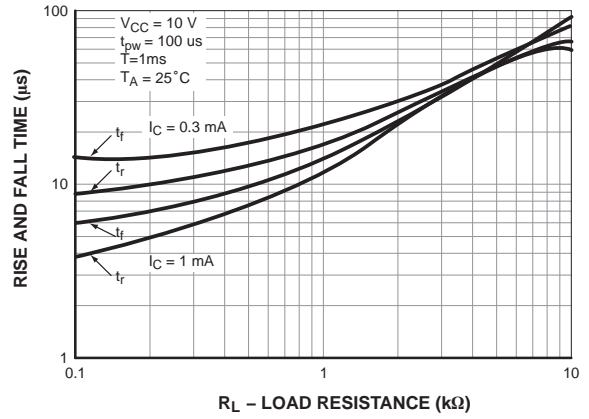


Figure 7. Rise and Fall Time vs. Load Resistance

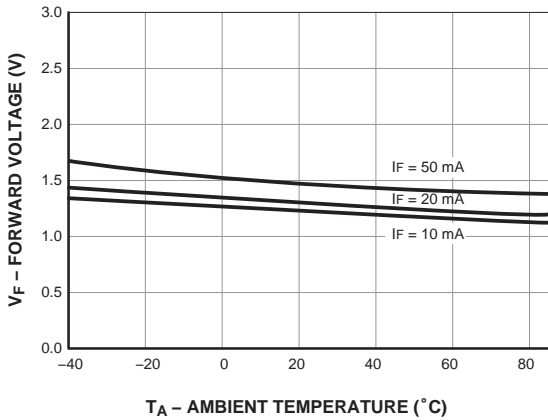


Figure 8. Forward Voltage vs. Ambient Temperature

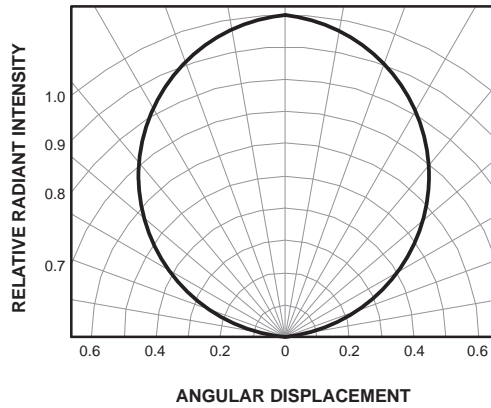


Figure 9. Radiation Diagram

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TAPING DIMENSIONS FOR GR OPTION

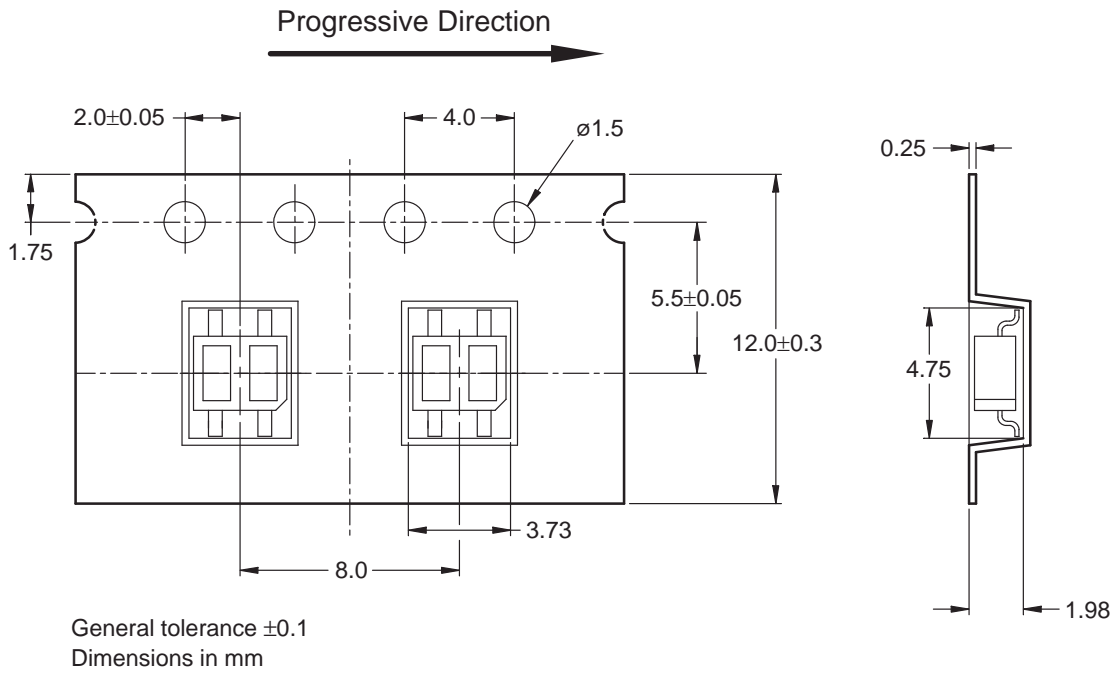


Figure 10. Taping Dimensions for GR Option

REEL DIMENSIONS

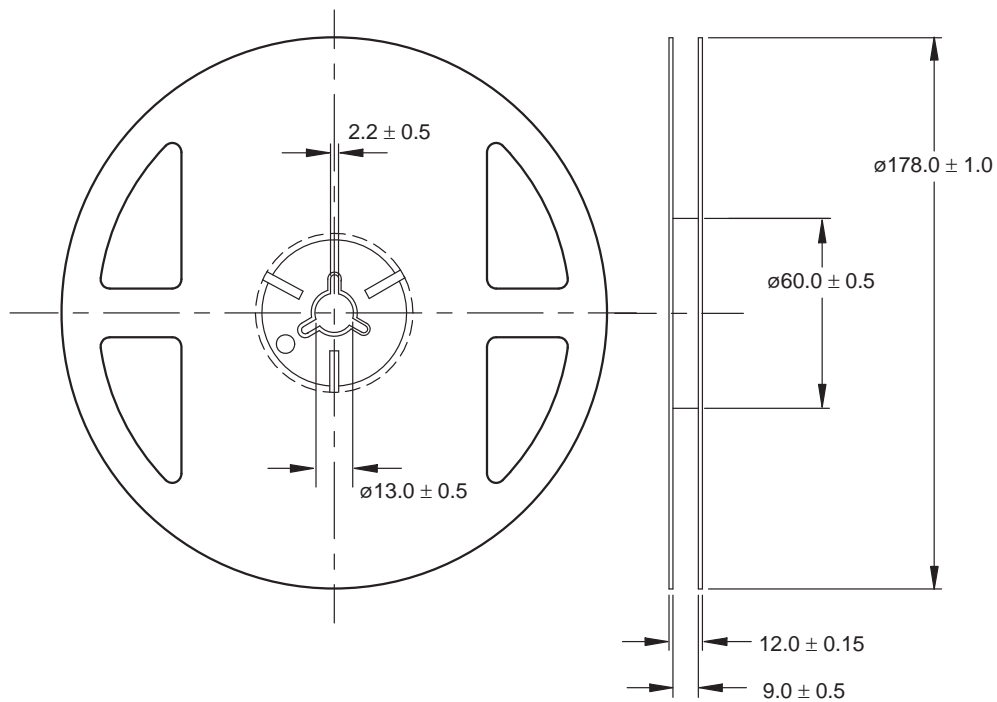
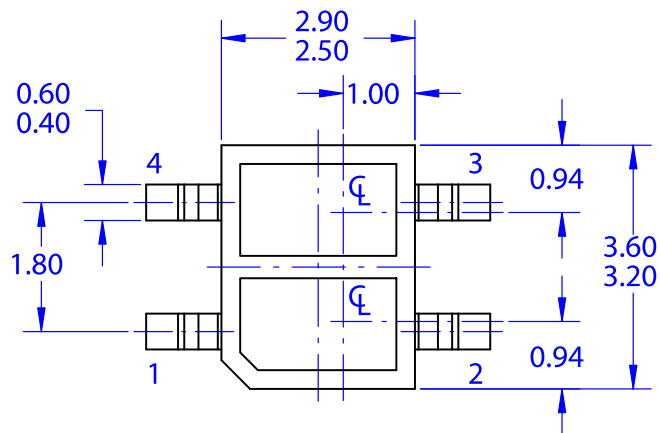


Figure 11. Reel Dimensions

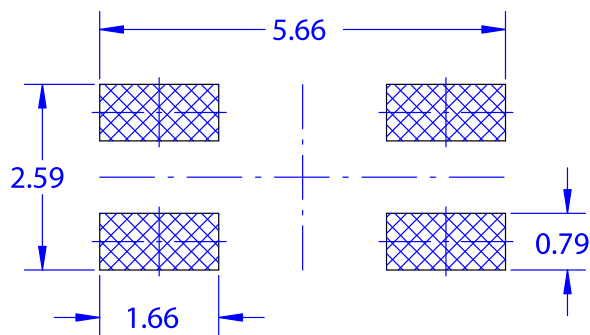
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PACKAGE DIMENSIONS

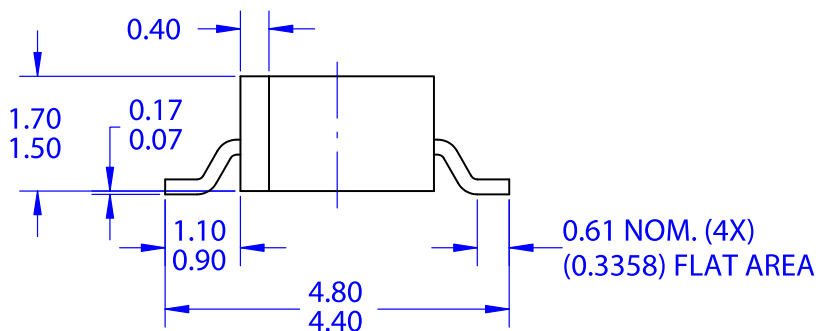
ARUSM-313 / REFLECTIVE RECTANGULAR SURFACE MOUNT
CASE 100CY
ISSUE O



TOP VIEW



LAND PATTERN RECOMMENDATION



SIDE VIEW

- NOTES:
A. NO INDUSTRY STANDARD APPLIES TO THIS PACKAGE
B. ALL DIMENSIONS ARE IN MILLIMETERS
C. TOLERANCE OF ± 0.15 MM ON ALL NON-NOMINAL DIMENSIONS

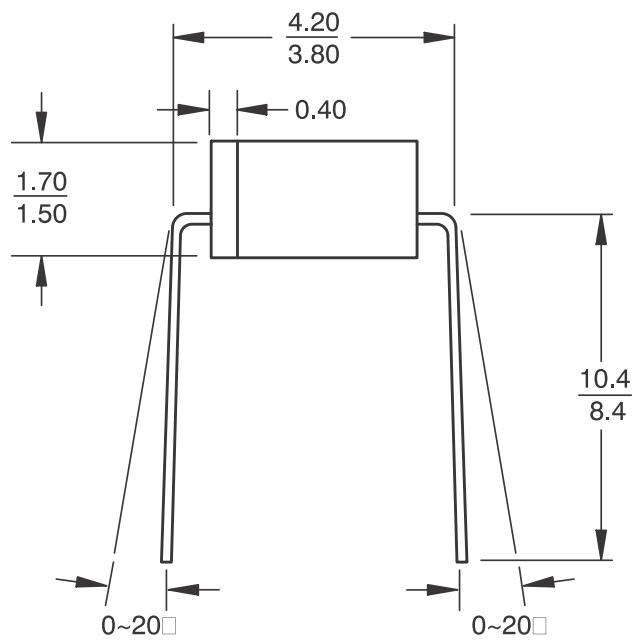
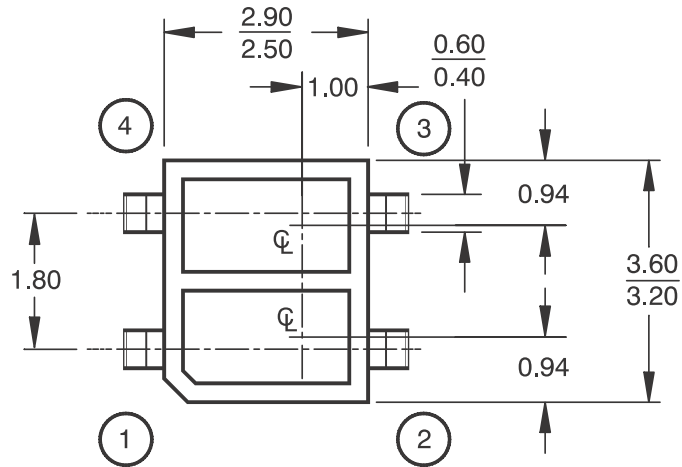
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PACKAGE DIMENSIONS

REFLECTIVE RECTANGULAR THROUGH HOLE

CASE 100AQ


ISSUE O



Notes:

1. Dimensions for all drawings are in millimeters.
2. Tolerance of ± 0.15 mm on all non-nominal dimensions

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