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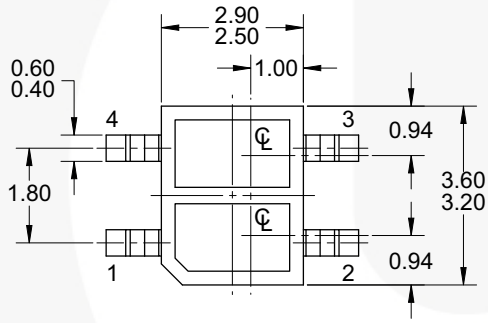
April 2016

QRE1113, QRE1113GR
Miniature Reflective Object Sensor

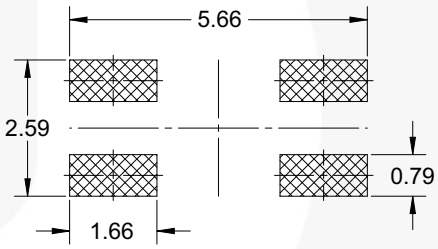
Features

- 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)

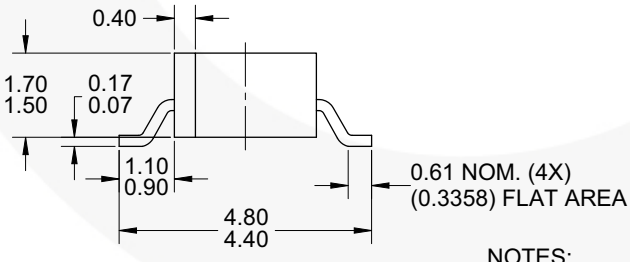
QRE1113GR Package Dimensions



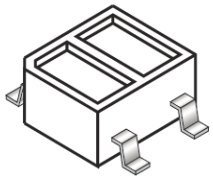
TOP VIEW



LAND PATTERN RECOMMENDATION

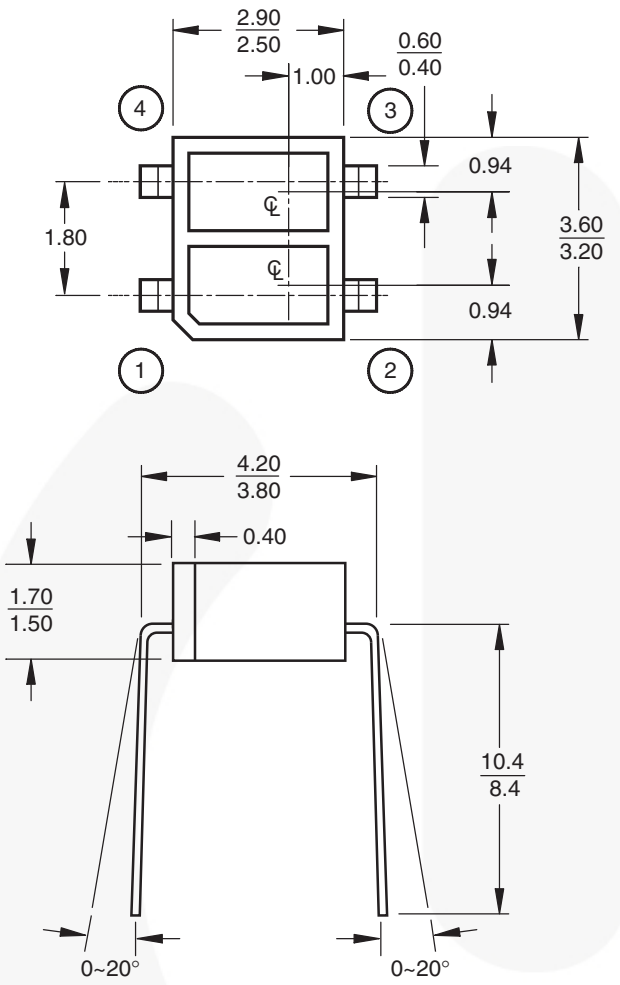


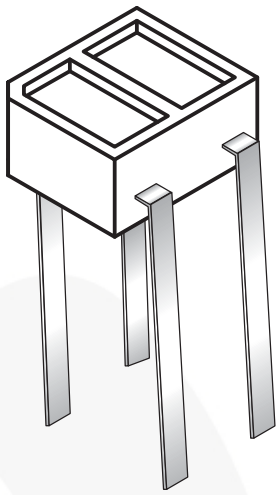
SIDE VIEW



NOTES:
A. NO INDUSTRY STANDARD APPLIES
   TO THIS PACKAGE
B. ALL DIMENSIONS ARE IN MILLIMETERS
C. TOLERANCE OF ±0.15MM ON ALL
   NON-NOMINAL DIMENSIONS
D. DRAWING FILENAME: MKT-ARU313Arev2

QRE1113 Package Dimensions(1, 2)

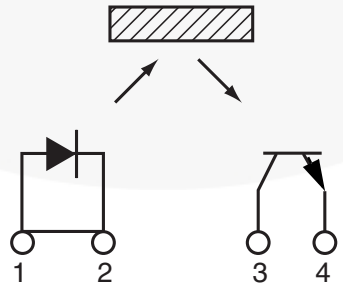




Notes:

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

Schematic



Pin 1: Anode
Pin 2: Cathode
Pin 3: Collector
Pin 4: Emitter

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at 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)(4 5, 6)	240 for 5 sec	°C
T_{SOL-F}	Soldering Temperature (Flow)(5, 6)	260 for 10 sec	°C
EMITTER			
I_F	Continuous Forward Current	50	mA
V_R	Reverse Voltage	5	V
I_{FP}	Peak Forward Current(7)	1	A
P_D	Power Dissipation(3)	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(3)	50	mW

Electrical / Optical Characteristics

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
INPUT DIODE						
V_F	Forward Voltage	I_F = 20 mA		1.2	1.6	V
I_R	Reverse Leakage Current	V_R = 5 V			10	µA
λ_{PE}	Peak Emission Wavelength	I_F = 20 mA		940		nm
OUTPUT TRANSISTOR						
I_D	Collector-Emitter Dark Current	I_F = 0 mA, V_{CE} = 20 V			100	nA
COUPLED						
$I_{C(ON)}$	On-State Collector Current	I_F = 20 mA, V_{CE} = 5 V(8)	0.10	0.40		mA
I_{CX}	Cross-Talk Collector Current	I_F = 20 mA, V_{CE} = 5 V(9)			1	µA
$V_{CE(SAT)}$	Saturation Voltage				0.3	V
t_r	Rise Time	V_{CC} = 5 V, $I_{C(ON)}$ = 100 µA, R_L = 100 kΩ		20		µs
t_f	Fall Time			20		µs

Notes:

3. Derate power dissipation linearly 1.00 mW/°C above 25°C.
4. RMA flux is recommended.
5. Methanol or isopropyl alcohols are recommended as cleaning agents.
6. Soldering iron 1/16" (1.6mm) from housing.
7. Pulse conditions: tp = 100 µs; T = 10 ms.
8. Measured using an aluminum alloy mirror at d = 1 mm.
9. No reflective surface at close proximity.

Typical Performance Curves

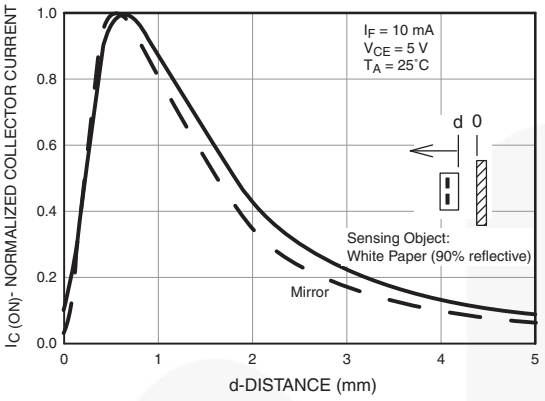


Fig. 1 Normalized Collector Current vs. Distance between device and reflector

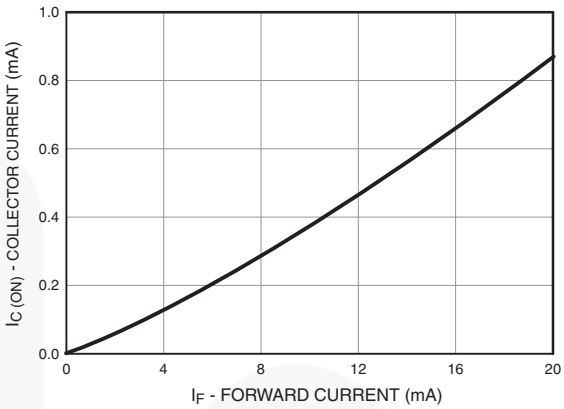


Fig. 2 Collector Current vs. Forward Current

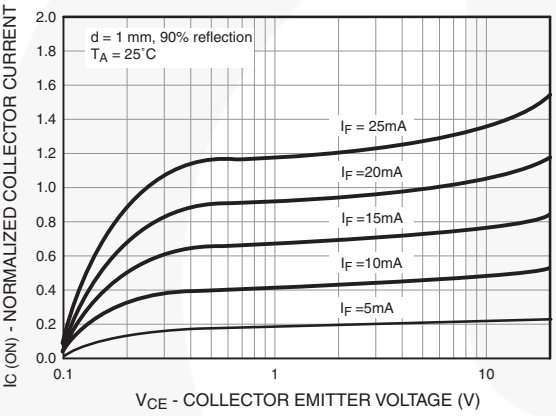


Fig. 3 Normalized Collector Current vs. Collector to Emitter Voltage

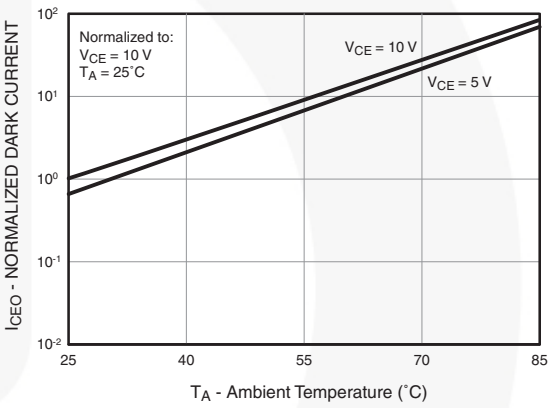


Fig. 4 Collector Emitter Dark Current (Normalized) vs. Ambient Temperature

Typical Performance Curves (Continued)

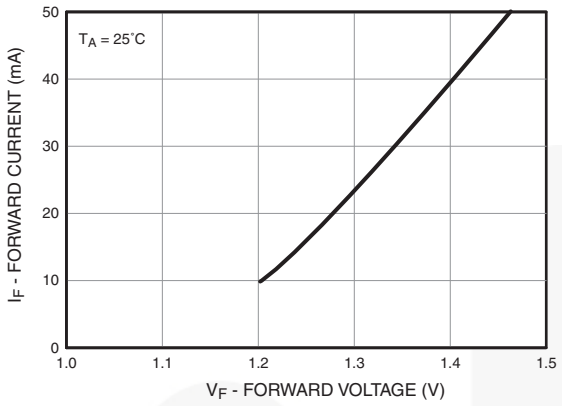


Fig. 6 Forward Current vs. Forward Voltage

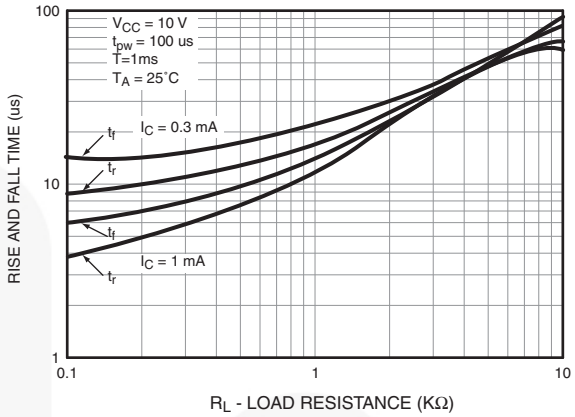


Fig. 7 Rise and Fall Time vs. Load Resistance

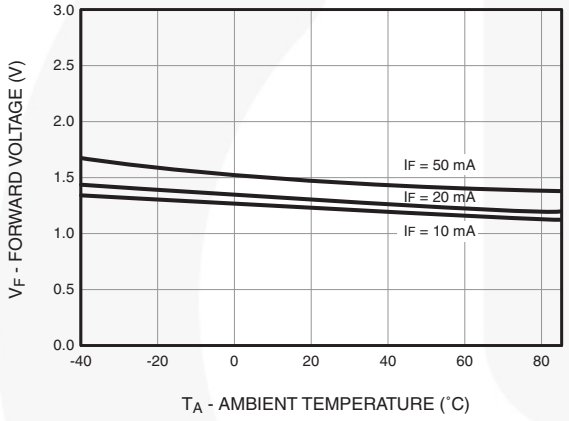


Fig. 8 Forward Voltage vs. Ambient Temperature

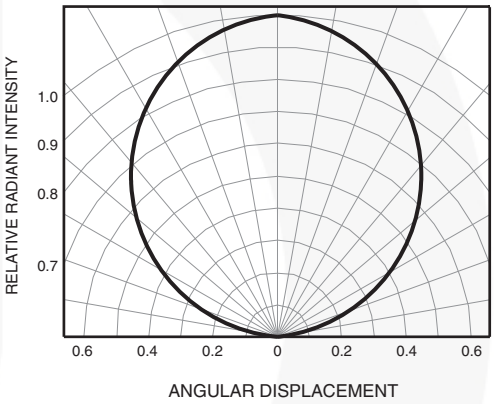
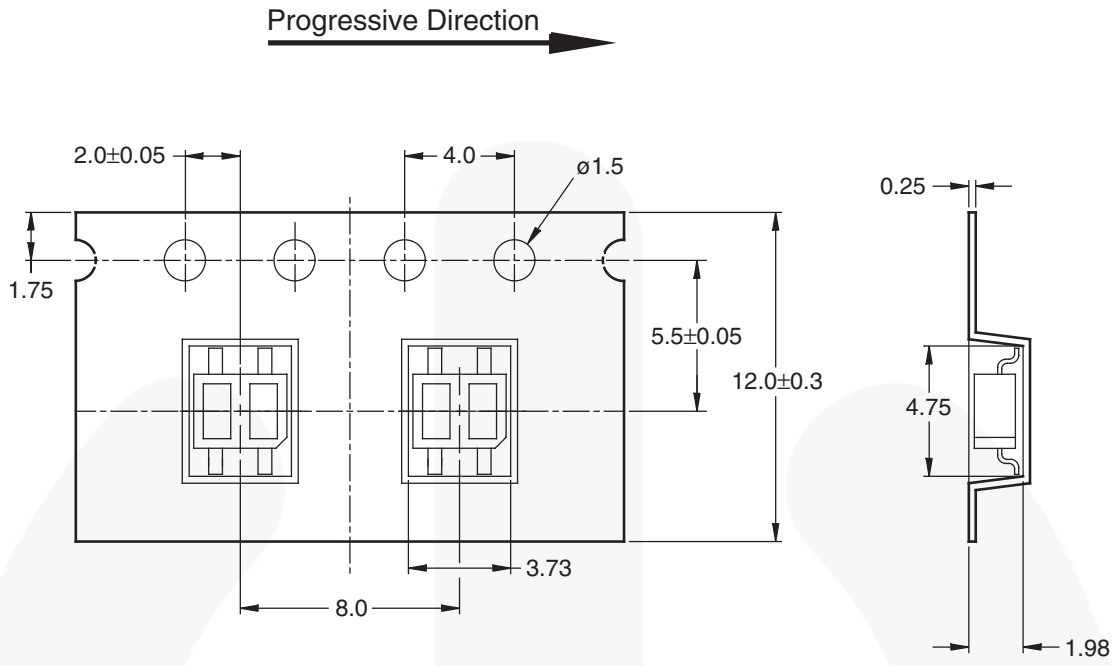


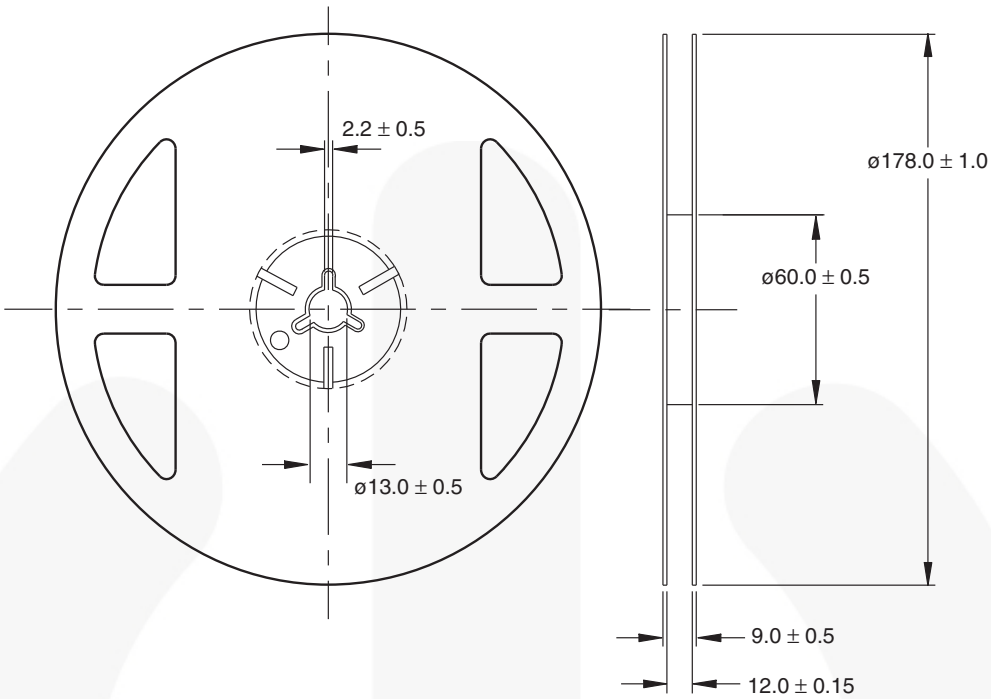
Fig. 8 Radiation Diagram

Taping Dimensions for GR option

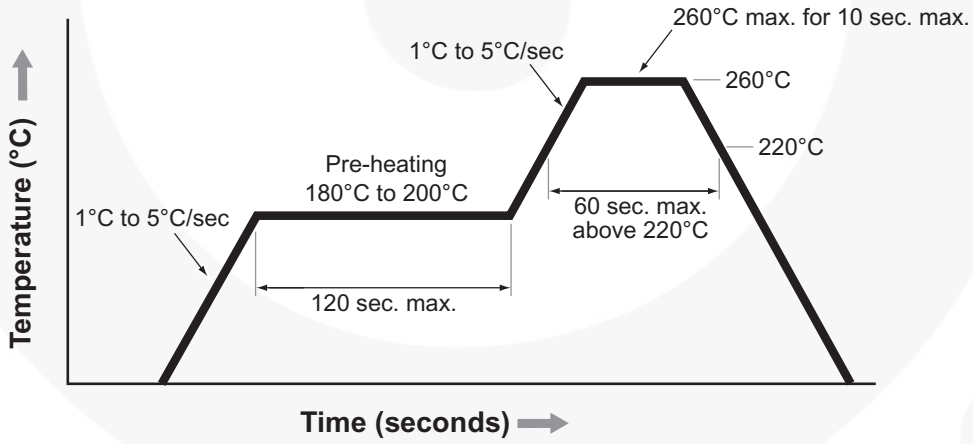


General tolerance ±0.1
Dimensions in mm

Reel Dimensions



Reflow Profile



Note: Reflow soldering should not be done more than twice.

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