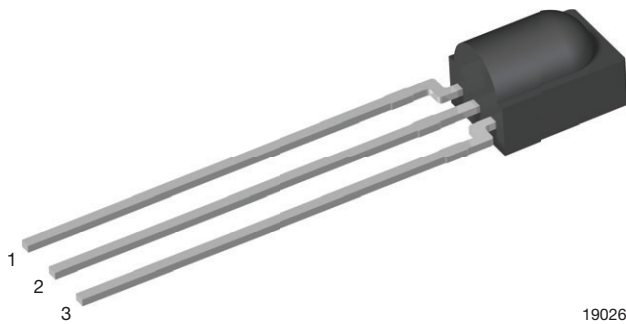


IR Detector for Mid Range Proximity Sensor



DESIGN SUPPORT TOOLS AVAILABLE



MECHANICAL DATA

Pinning

1 = OUT, 2 = GND, 3 = V_S

DESCRIPTION

The TSSP58P38 is a compact infrared detector module for proximity sensing application. It receives 38 kHz modulated signals and has a peak sensitivity of 940 nm.

The length of the detector's output pulse varies in proportion to the amount of light reflected from the object being detected.

FEATURES

- Up to 2 m for proximity sensing
- Receives 38 kHz modulated signal
- Photo detector and preamplifier in one package
- Low supply current
- Shielding against EMI
- Visible light is suppressed by IR filter
- Insensitive to supply voltage ripple and noise
- Supply voltage: 2.5 V to 5.5 V
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

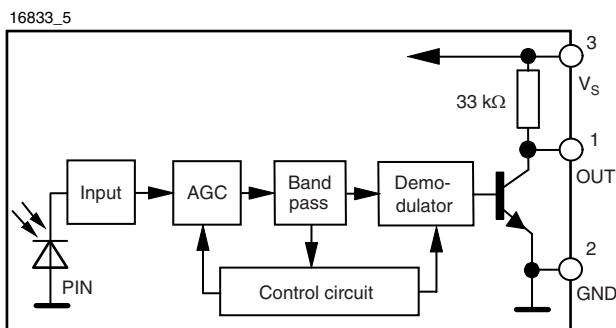


APPLICATIONS

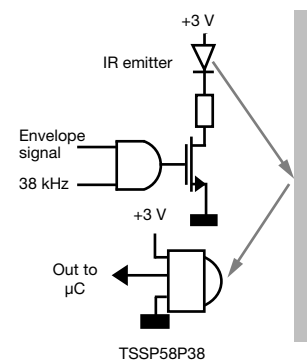
- Object approach detection for activation of displays and user consoles, signaling of alarms, etc.
- Simple gesture controls
- Differentiation of car arrival, static, car departure in parking lots
- Reflective sensors for toilet flush
- Navigational sensor for robotics

PARTS TABLE		
Carrier frequency	38 kHz	TSSP58P38
Package		Minicast
Pinning		1 = OUT, 2 = GND, 3 = V_S
Dimensions (mm)		5.0 W x 6.95 H x 4.8 D
Mounting		Leaded
Application		Proximity sensors

BLOCK DIAGRAM



PROXIMITY SENSING



ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Supply voltage (pin 3)		V_S	-0.3 to +6	V
Supply current (pin 3)		I_S	5	mA
Output voltage (pin 1)		V_O	-0.3 to 5.5	V
Voltage at output to supply		$V_S - V_O$	-0.3 to ($V_S + 0.3$)	V
Output current (pin 1)		I_O	5	mA
Junction temperature		T_j	100	°C
Storage temperature range		T_{stg}	-25 to +85	°C
Operating temperature range		T_{amb}	-25 to +85	°C
Power consumption	$T_{amb} \leq 85\text{ °C}$	P_{tot}	10	mW

Note

- Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect the device reliability

ELECTRICAL AND OPTICAL CHARACTERISTICS ($T_{amb} = 25\text{ °C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply current (pin 3)	$E_e = 0, V_S = 5\text{ V}$	I_{SD}	0.55	0.7	0.9	mA
	$E_v = 40\text{ klx, sunlight}$	I_{SH}	-	0.8	-	mA
Supply voltage		V_S	2.5	-	5.5	V
Receiving distance	Direct line of sight, test signal see fig. 1, IR diode TSAL6200, $I_F = 50\text{ mA}$	d	-	18	-	m
Output voltage low (pin 1)	$I_{OSL} = 0.5\text{ mA}, E_e = 0.7\text{ mW/m}^2$, test signal see fig. 1	V_{OSL}	-	-	100	mV
Minimum irradiance	Pulse width tolerance: $t_{pi} - 5/f_0 < t_{po} < t_{pi} + 6/f_0$, test signal see fig. 1	$E_e\text{ min.}$	-	0.2	0.4	mW/m ²
Maximum irradiance	$t_{pi} - 5/f_0 < t_{po} < t_{pi} + 6/f_0$, test signal see fig. 1	$E_e\text{ max.}$	50	-	-	W/m ²
Directivity	Angle of half receiving distance	$\phi_{1/2}$	-	± 45	-	deg

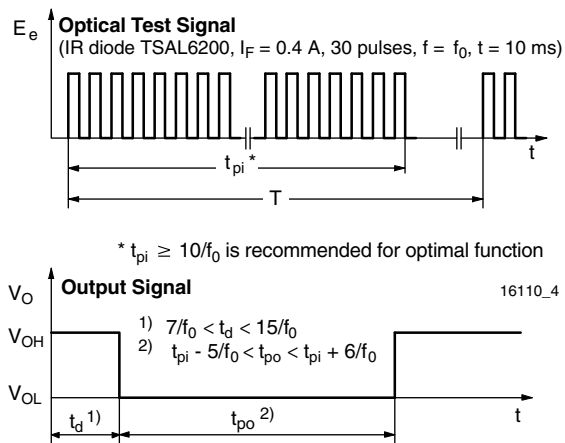
TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ °C}$, unless otherwise specified)


Fig. 1 - Output Active Low

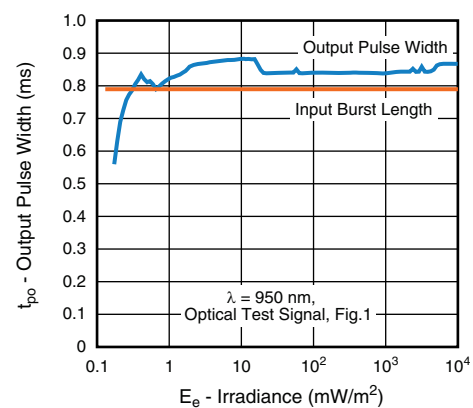


Fig. 2 - Pulse Length and Sensitivity in Dark Ambient

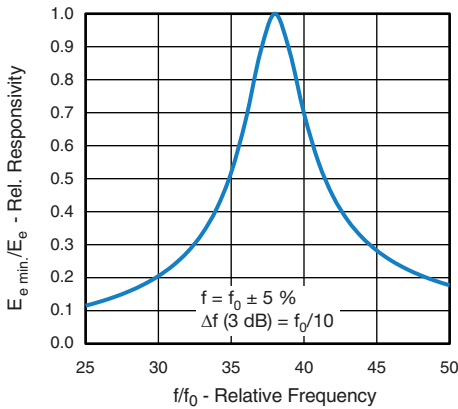


Fig. 3 - Frequency Dependence of Responsivity

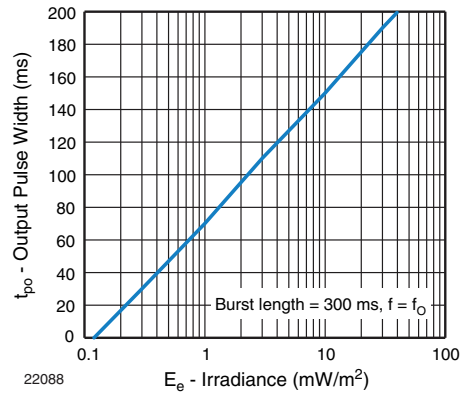


Fig. 6 - Maximum Output Pulse Width vs. Irradiance

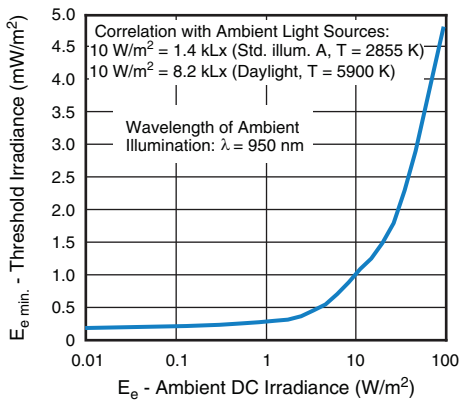


Fig. 4 - Sensitivity in Bright Ambient

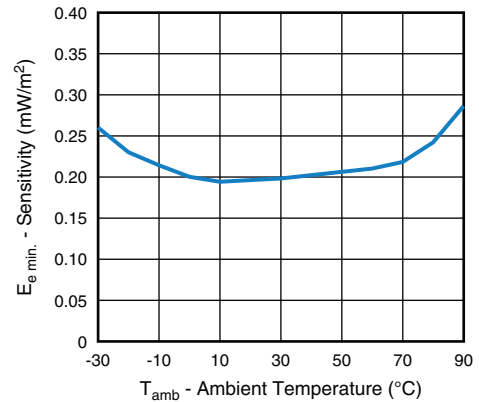


Fig. 7 - Sensitivity vs. Ambient Temperature

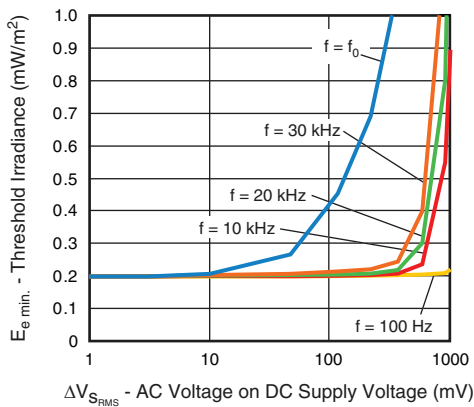


Fig. 5 - Sensitivity vs. Supply Voltage Disturbances

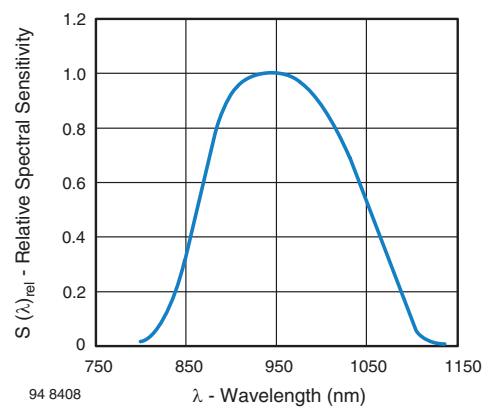


Fig. 8 - Relative Spectral Sensitivity vs. Wavelength

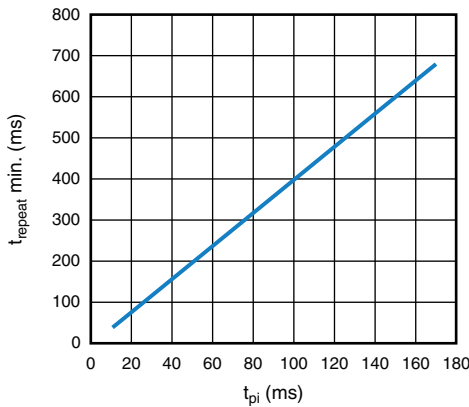


Fig. 9 - Max. Rate of Bursts

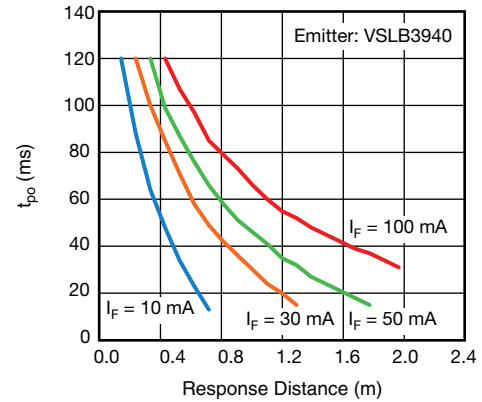


Fig. 11 - t_{po} vs. Distance Kodak Gray Card Plus 15 %

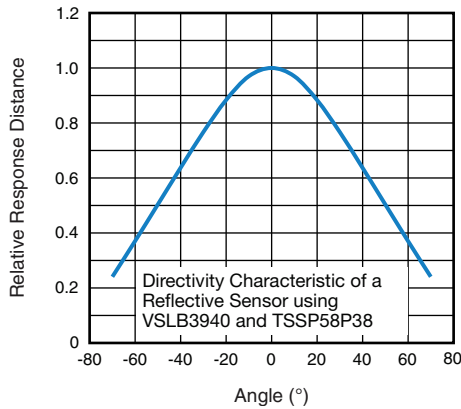


Fig. 10 - Angle Characteristic

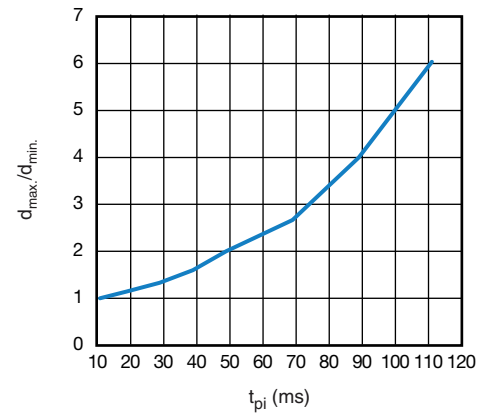
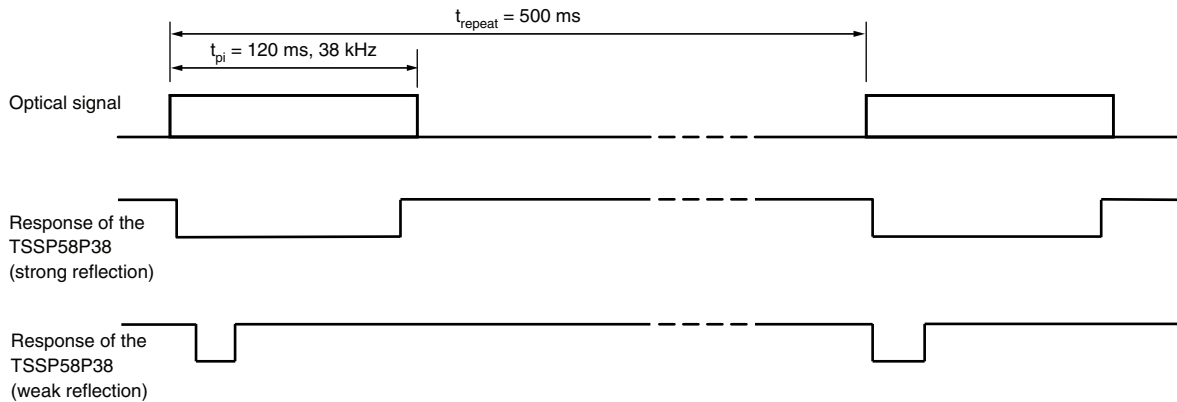


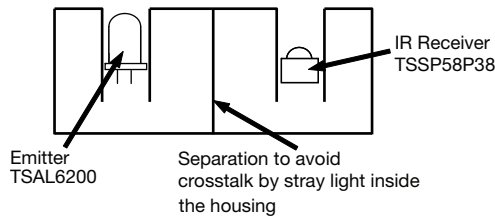
Fig. 12 - Dynamic Range of Sensor vs. t_{pi}

The typical application of the TSSP58P38 is a reflective sensor with analog information contained in its output. Such a sensor is evaluating the time required by the AGC to suppress a quasi continuous signal. The time required to suppress such a signal is longer when the signal is strong than when the signal is weak, resulting in a pulse length corresponding to the distance of an object from the sensor. This kind of analog information can be evaluated by a microcontroller. The absolute amount of reflected light depends much on the environment and is not evaluated. Only sudden changes of the amount of reflected light, and therefore changes in the pulse width, are evaluated using this application.

Example of a signal pattern:



Example for a sensor hardware:

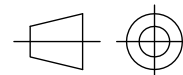
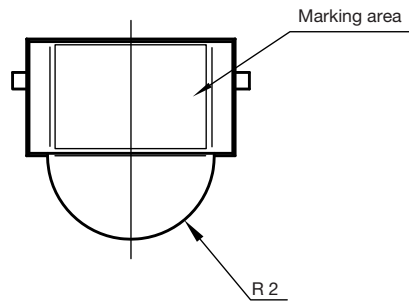
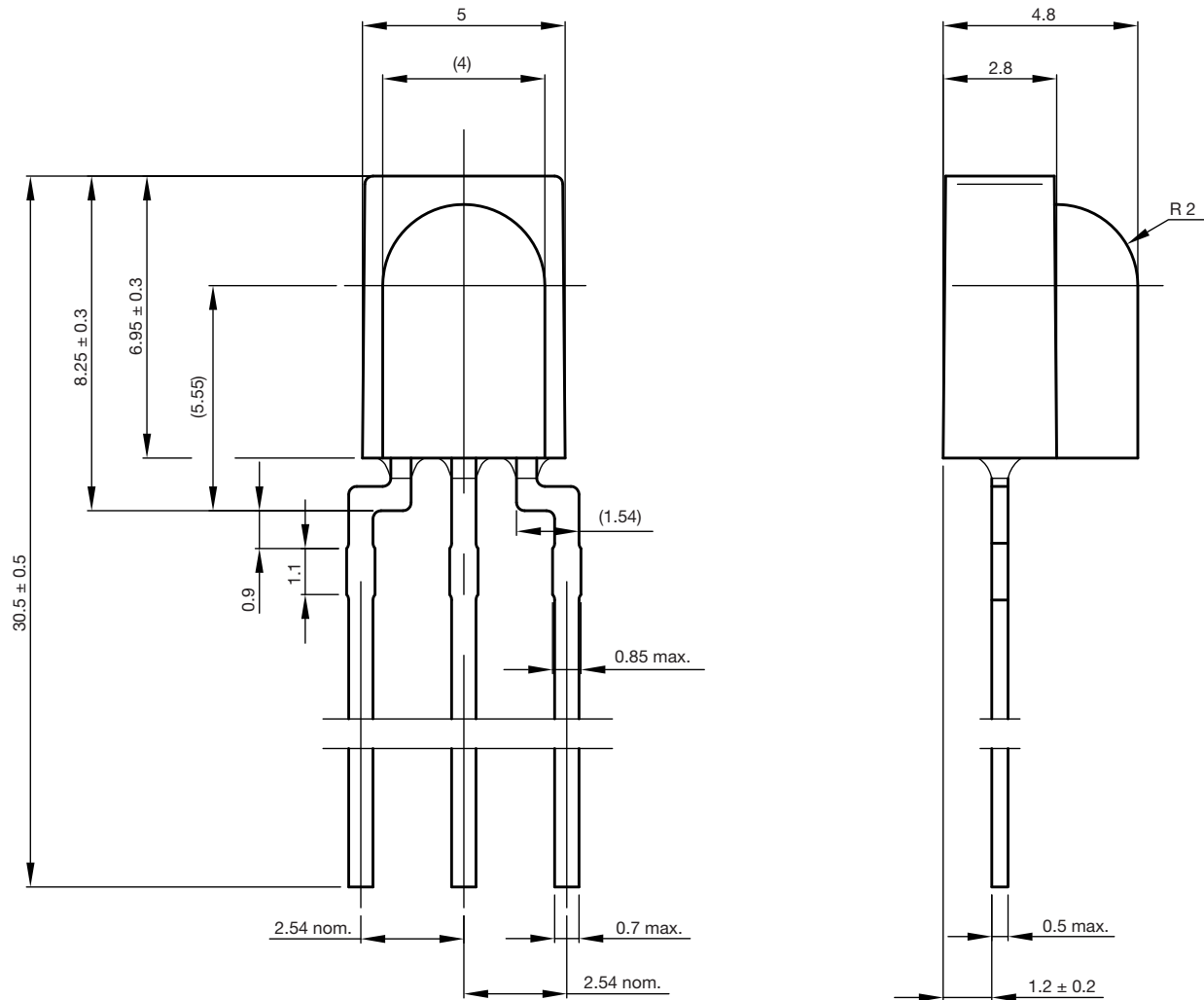


There should be no common window in front of the emitter and receiver in order to avoid crosstalk by guided light through the window.

The logarithmic characteristic of the AGC in the TSSP58P38 results in an almost linear relationship between distance and pulse width. Ambient light has also some impact to the pulse width of this kind of sensor, making the pulse shorter.



PACKAGE DIMENSIONS in millimeters



technical drawings according to DIN specifications

Not indicated to tolerances ± 0.2

Drawing-No.: 6.550-5263.01-4
 Issue: 12; 16.04.10
 19009



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Infrared Receivers](#) category:

Click to view products by [Vishay](#) manufacturer:

Other Similar products are found below :

[TSOP38436](#) [TSOP6136TT](#) [TSOP2456](#) [TSOP31456](#) [TSOP38336](#) [TSOP6130TT](#) [TSOP34438SS1V](#) [TSOP57438ETT1](#) [TSOP6140TR](#)
[TSOP53356](#) [TSOP53256](#) [TSOP31136](#) [TSOP75238WTT](#) [TSOP75338TR](#) [TSSP77038TT](#) [TSOP59438](#) [OSRB38C9AA](#) [TSOP75456TR](#)
[TSSP4038SS1XB](#) [TSOP39438TR1](#) [TSOP6133TR](#) [IS471FE](#) [OSRB38C9BA](#) [LT1328CMS8#PBF](#) [PB11CNT15WR](#) [IRM-3638M3F99-E80](#)
[IRM-3638MF56](#) [IRM-3638C/TR1-11](#) [DY-PT4133B-A2](#) [HL-304PT1C-T](#) [HL-503PT1C-T](#) [PT2424-6B](#) [PT334-6B-52](#) [R903V1-7C\(L\)](#)
[GP1UD28YK](#) [GP1UM272RKVF](#) [GP1UM281QKVF](#) [TSOP36438TT](#) [TSOP75340TT](#) [TSOP98238](#) [TSOP98456](#) [TSDP34138](#) [TSDP34156](#)
[TSDP34338](#) [TSDP34356](#) [TSMP4138](#) [TSMP58000](#) [TSMP58138](#) [TSMP6000TT](#) [TSMP77000TR](#)