

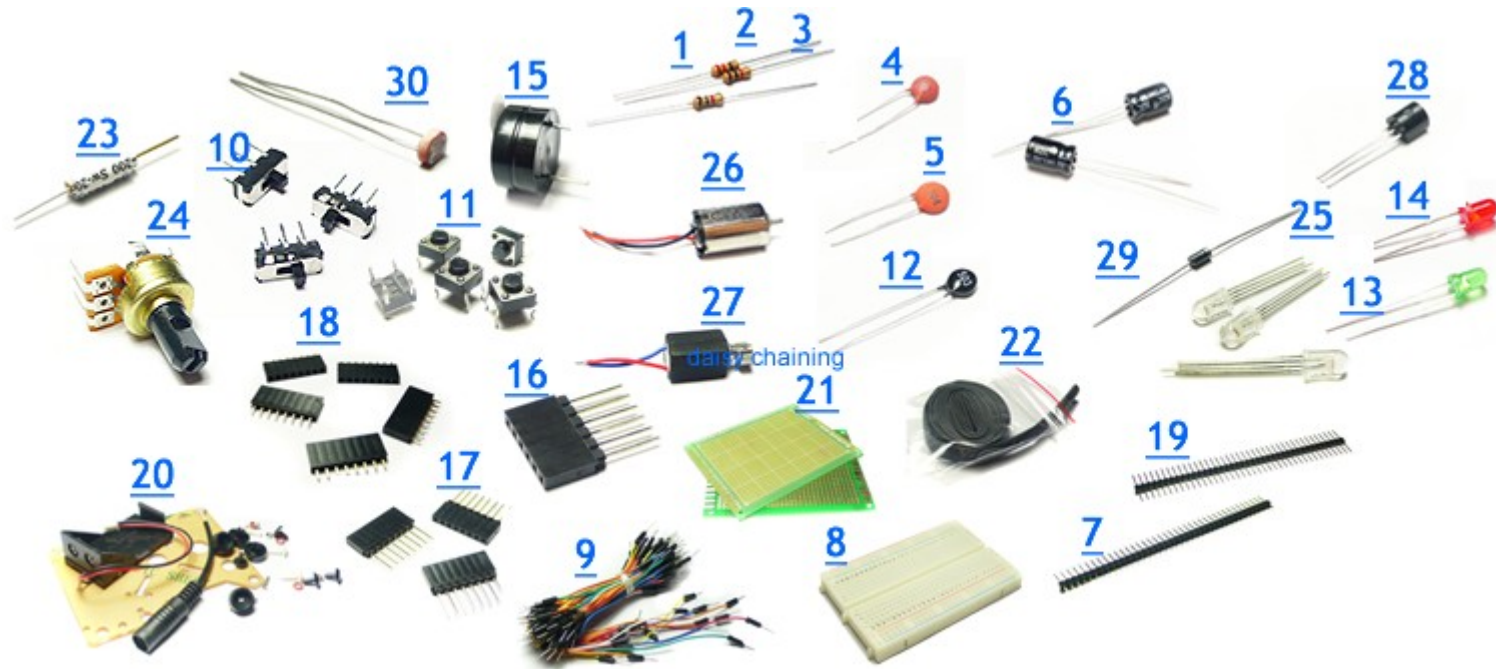
Catalyst Pack Datasheet

By Eric Pan
29th SEP 2009

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Product List



#	Item	Qty	Unit	Category	Related link
1	330 resistors	10	pcs	Components	http://en.wikipedia.org/wiki/Resistors
2	10K resistors	10	pcs	Components	http://en.wikipedia.org/wiki/Resistors
3	1K resistors	10	pcs	Components	http://en.wikipedia.org/wiki/Resistors
4	10nF ceramic capacitor	10	pcs	Components	http://en.wikipedia.org/wiki/Ceramic_capacitor
5	100nF ceramic capacitor	10	pcs	Components	http://en.wikipedia.org/wiki/Ceramic_capacitor

6	100uF electrolytic capacitor	5	pcs	Components	http://en.wikipedia.org/wiki/Electrolytic_capacitor
7	40pin male breakaway headers	1	pcs	Structure	http://www.seeedstudio.com/depot/break-away-headers-male-40-pin-p-9.html
8	Half size basic breadboard	1	pcs	Structure	
9	Breadborad jumper wire 75pcs pack	75	pcs	Structure	http://www.seeedstudio.com/depot/breadborad-jumper-wire-75pcs-pack-p-234.html
10	DPDT switch for breadboard	3	pcs	Input	http://en.wikipedia.org/wiki/DPDT_switch
11	Mini Push Button for breadboard	5	pcs	Input	http://arduino.cc/en/Tutorial/Button
12	Thermister	2	pcs	Input	http://arduino.cc/en/Tutorial/AnalogInput
13	Basic Green LED	5	pcs	Output	http://arduino.cc/en/Tutorial/Blink
14	Basic Red LED	5	pcs	Output	http://arduino.cc/en/Tutorial/Blink
15	Piezo Buzzer	1	pcs	Output	http://arduino.cc/en/Tutorial/Melody
16	6 pin stackable female header	1	pcs	Structure	http://seeedstudio.com/depot/datasheet/Hello_Seeduino.pdf
17	8 pin stackable female header	3	pcs	Structure	http://seeedstudio.com/depot/datasheet/Hello_Seeduino.pdf
18	8 pin female header	5	pcs	Structure	http://www.seeedstudio.com/depot/break-away-headers-female-8-pin-p-13.html
19	40pin male breakaway dual-headers	1	pcs	Structure	http://seeedstudio.com/depot/datasheet/Hello_Seeduino.pdf
20	Harness for Arduino/Seeeduino kit	1	pcs	Structure	http://seeedstudio.com/depot/datasheet/Hello_Seeduino.pdf
21	Proto board 7*9	2	pcs	Structure	http://www.seeedstudio.com/depot/protoboard-7cm-9cm-p-80.html
22	Heat Shrink Tubing 3mm	1	meter	Structure	http://en.wikipedia.org/wiki/Heat-shrink_tubing
23	Tilt Sensor	2	pcs	Input	http://arduino.cc/en/Tutorial/TiltSensor
24	Rotary Potentiometer	1	pcs	Input	http://arduino.cc/en/Tutorial/AnalogInput
25	5mm RGB LED	3	pcs	Output	http://arduino.cc/en/Tutorial/LEDColormixerWith3Potentiometers
26	Mini DC motor	1	pcs	Output	http://arduino.cc/en/Tutorial/Fading
27	Vibration Motor	1	pcs	Output	http://arduino.cc/en/Tutorial/Fading
28	Transistor NPN	1	pcs	Components	http://en.wikipedia.org/wiki/Transistor
29	Diode	1	pcs	Components	http://en.wikipedia.org/wiki/Diode
30	Photoresistor	2	pcs	Components	http://arduino.cc/en/Tutorial/Calibration
31	Component box	1	pcs	Misc	

Datasheets

Transistor NPN

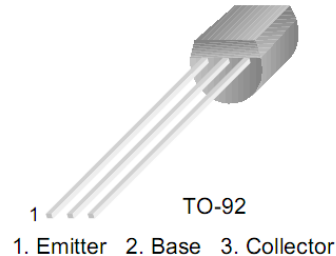




SS9013

1W Output Amplifier of Potable Radios in Class B Push-pull Operation.

- High total power dissipation. ($P_T=625\text{mW}$)
- High Collector Current. ($I_C=500\text{mA}$)
- Complementary to SS9012
- Excellent h_{FE} linearity.



NPN Epitaxial Silicon Transistor

Absolute Maximum Ratings $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{CBO}	Collector-Base Voltage	40	V
V_{CEO}	Collector-Emitter Voltage	20	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current	500	mA
P_C	Collector Power Dissipation	625	mW
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature	-55 ~ 150	$^\circ\text{C}$

Electrical Characteristics $T_a=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
BV_{CBO}	Collector-Base Breakdown Voltage	$I_C=100\mu\text{A}, I_E=0$	40			V
BV_{CEO}	Collector-Emitter Breakdown Voltage	$I_C=1\text{mA}, I_B=0$	20			V
BV_{EBO}	Emitter-Base Breakdown Voltage	$I_E=100\mu\text{A}, I_C=0$	5			V
I_{CBO}	Collector Cut-off Current	$V_{CB}=25\text{V}, I_E=0$			100	nA
I_{EBO}	Emitter Cut-off Current	$V_{EB}=3\text{V}, I_C=0$			100	nA
h_{FE1} h_{FE2}	DC Current Gain	$V_{CE}=1\text{V}, I_C=50\text{mA}$ $V_{CE}=1\text{V}, I_C=500\text{mA}$	64 40	120 120	202	
$V_{CE}(\text{sat})$	Collector-Emitter Saturation Voltage	$I_C=500\text{mA}, I_B=50\text{mA}$		0.16	0.6	V
$V_{BE}(\text{sat})$	Base-Emitter Saturation Voltage	$I_C=500\text{mA}, I_B=50\text{mA}$		0.91	1.2	V
$V_{BE}(\text{on})$	Base-Emitter On Voltage	$V_{CE}=1\text{V}, I_C=10\text{mA}$	0.6	0.67	0.7	V

h_{FE} Classification

Classification	D	E	F	G	H
h_{FE1}	64 ~ 91	78 ~ 112	96 ~ 135	112 ~ 166	144 ~ 202

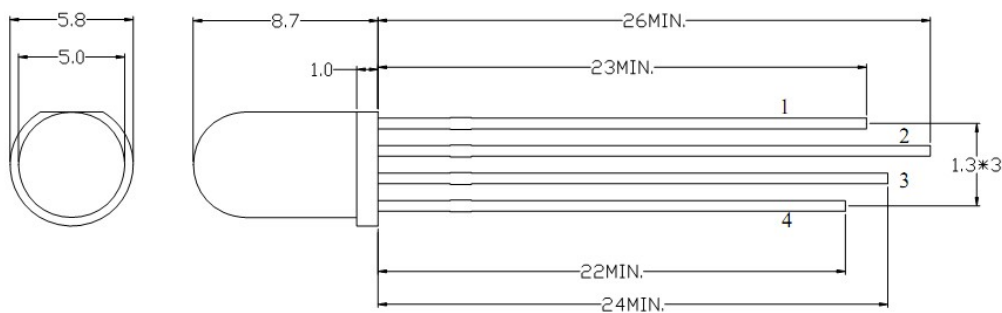
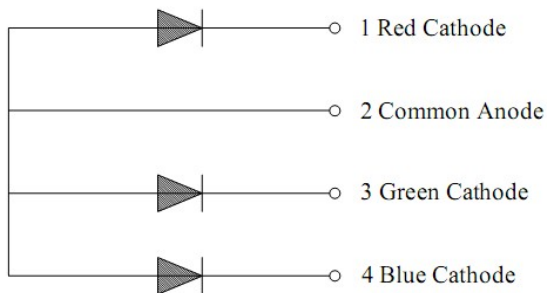
RGB LED

This full color super bright LED contains red green and blue LEDs housed in a single 5mm epoxy package, water clear common ANODE.

Package Dimentions

Notes:

1. All dimensions are in millimeters
2. Tolerance is $\pm 0.2\text{mm}$ unless otherwise noted.



FEATURES

- * 5.0mm DIA LED LAMP
- * LOW POWER CONSUMPTION.
- * I.C. COMPATIBLE.
- * THREE CHIPS ARE MATCHED FOR UNIFORM LIGHT OUTPUT.
- * LONG LIFE-SOLIDSTATE RELIABILITY.
- * FULL COLOR AND HIGH CONTRAST LAMP

CHIP MATERIALS

- * Dice Material : AlGaInP/GaAs & GaInN/GaN & GaInN/GaN
- * Light Color : FULL COLOR(SUPER RED & ULTRA PURE GREEN & ULTRA BLUE)
- * Lens Color : WATER CLEAR

ABSOLUTE MAXIMUM RATING:(Ta = 25°C)

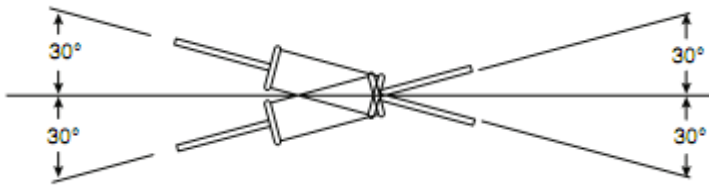
SYMBOL	DESCRIPTION	ULTRA RED	ULTRA PURE GREEN	ULTRA BLUE	UNIT
PAD	Power Dissipation Per Chip	80	130	120	mW
VR	Reverse Voltage Per Chip	5	5	5	V
IF	Average Forward Current Per Chip	30	30	30	mA
IPF	Peak Forward Current Per Chip (Duty=0.1,1KHZ)	60	120	70	mA
-	Derating Linear From 25°C Per Chip	0.4	0.4	0.4	mA/°C
Topr	Operating Temperature Range	-25°C to 85°C			
Tstg	Storage Temperature Range	-40°C to 85°C			
Lead Soldering Temperature { 1.6mm(0.063 inch) From Body } 260°C±5°C For 5 Seconds					

ELECTRO-OPTICAL CHARACTERISTICS:(Ta=25°C)

SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
VF	Forward Voltage	IF=20mA	Ultra Red	2.0	2.6	V
			Ultra Pure Green	3.5	4.0	V
			Ultra Blue	3.5	4.0	V
IR	Reverse Current	VR=5V	Ultra Red		100	μA
			Ultra Pure Green		100	μA
			Ultra Blue		100	μA
λD	Dominant Wavelength	IF=20mA	Ultra Red	625		nm
			Ultra Pure Green	525		nm
			Ultra Blue	460		nm
Δλ	Spectral Line Half-Width	IF=20mA	Ultra Red	20		nm
			Ultra Pure Green	22		nm
			Ultra Blue	30		nm
2θ1/2	Half Intensity Angle	IF=20mA	Ultra Red	40		deg
			Ultra Pure Green	40		deg
			Ultra Blue	40		deg
Iv	Luminous Intensity	IF=20mA	Ultra Red	1500	2100	mcd
			Ultra Pure Green	4200	5800	mcd
			Ultra Blue	1100	1500	mcd

Tilt rolling ball switch

Activation angle:



Soldering Process:

- Temperature: 250°C, 3 seconds (Can be soldered by hand only.)

Electrical Specifications:

- Max. Switch Rating: <6mA/24VDC
- Electrical Life Endurance: >50,000 cycles
- Contact Resistance: 2Ω max. (measured at 45° tilt)

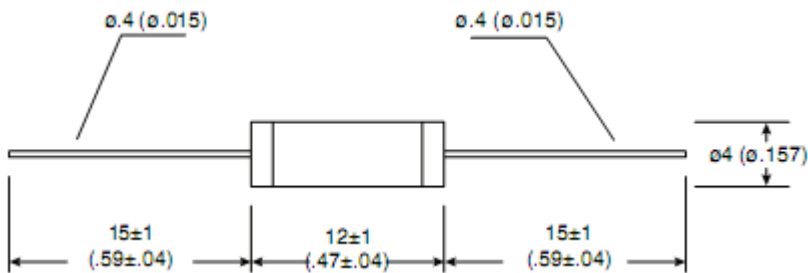
Mechanical Specifications:

- Differential Angle: 30° max.
- Operating Temperature: 0°~+100°C

Materials:

- Switch Housing: Copper coated with gold (10μ)
- Terminal: Copper coated with gold
- Rolling Ball: Copper coated with gold. Ball weighted

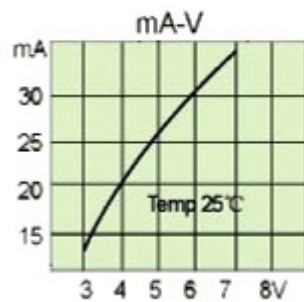
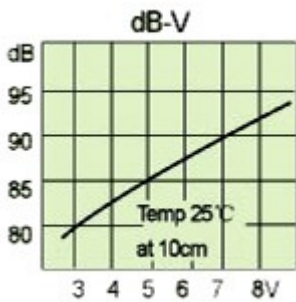
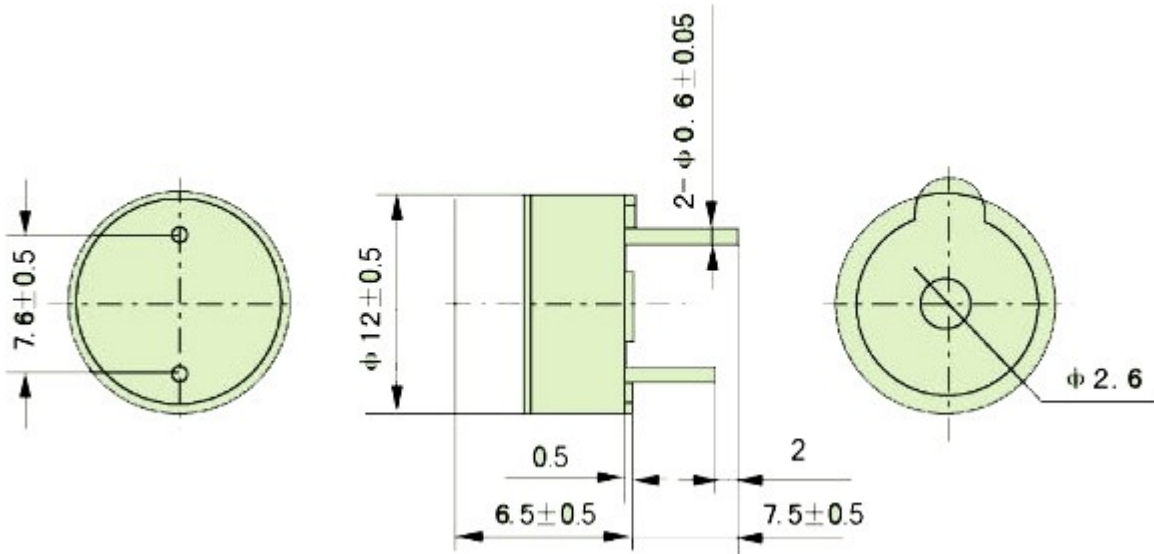
Dimension:



Weight: 0.25g.

Piezo Buzzer

Dimension



Rated Voltage	Operation Voltage	Rated Current	Sound Output	Resonant Freq	Operating Temp	Storage Temp	Weight
5V	4~7 V	<28mA	>85dB	2300±300	-20~+45	-20~+60	1.5

Thermistor



Pearl-Shaped Precision NTC Thermistor for Temperature Measurement

The MF52 series of Pearl-Shaped NTC Thermistors is ethoxyline resin coated. The small size is made possible by new materials and manufacturing methods which provide the benefit of close tolerances and fast response. MF52 thermistors are available with 5 lead styles in standard or custom lengths.

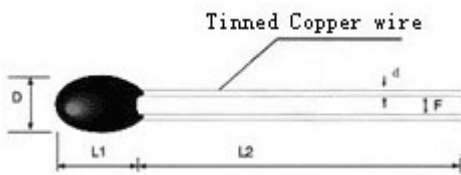
Application

- Heating, Ventilation & Air Conditioning
- Temperature Regulation and Measurement
- Electronic Thermometers
- Liquid Level Sensing
- Automotive Electronics
- Medical Equipment and Apparatus
- Battery Packs and Portable Electronics

Characteristics

- Small Size and fast response
- Available tolerances: $\pm 1\%$, $\pm 2\%$, $\pm 3\%$ and $\pm 5\%$
- Long-term Stability and Reliability
- Excellent Tolerance and Interchangeability
- Available in all popular resistance values
- Dissipation Constant $\geq 2.0 \text{ mW}/^\circ\text{C}$
- Time Constant of ≤ 7 seconds in still air
- Available in custom probes
- UL Listed E240991

Dimensions (mm)



Code	D max	L ₁ max	L ₂ min	d +/- 0.05	F +/- 0.05
A1	2	3	25	0.3	2.0
A2	3	4	25	0.45	2.5

A: Tin. Ag. nickel plated cu wire

Main Techno-Parameter

Part No.	Rated Resistance R ₂₅ (KΩ)	B Value (25/50fC)(K)	Rated Power(mw)	Dissi. coef. (mW/fC)	Thermal time Constant(S)	Operating Temp.(fC)
MF52 4300	20-1000	4300	≤ 50	≥ 2.0 In Still Air	≤ 7 In Still Air	-55f - +125fC

Remark:

* B Value (25/50C) error is $\pm 1\%$ for components with rated resistance tolerance of $\pm 1\%$ and $\pm 2\%$ for all others.

Notice:

* The two ends of the lead wire cannot endure too big pull because of the small size and soldered spot in series of MF52.

* Solder at least 5mm from the bottom of wire.

Mini Vibration Motor

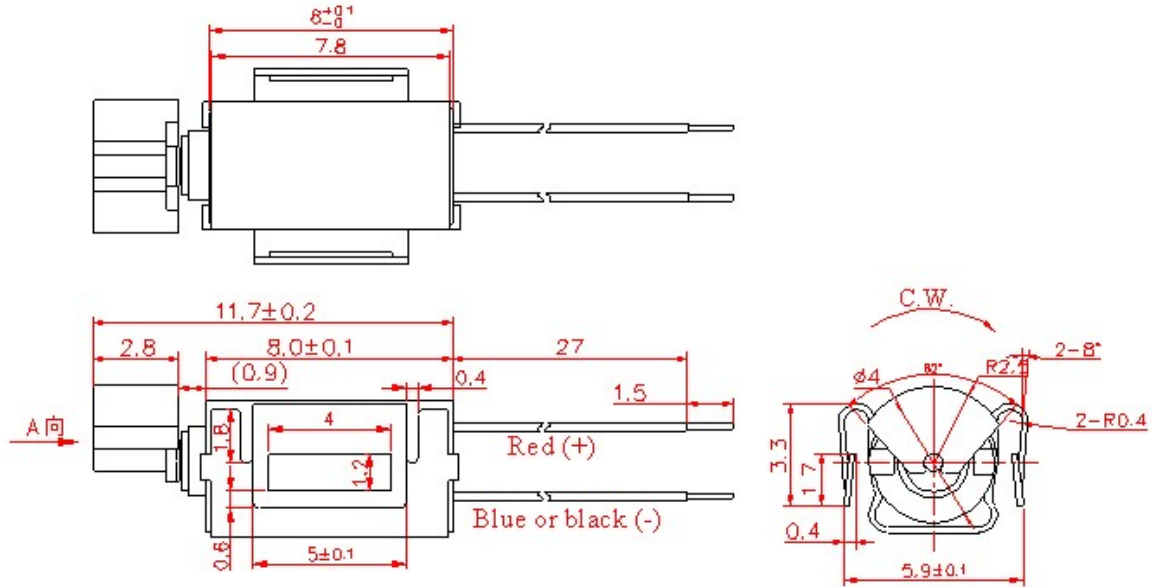


Operating conditions

Items	Specifications	Condition & Remarks
Rated voltage	3.0V DC	
Rated load	Counter weight	As specified in the outline drawing.
Rotation	C.W. (clockwise)	
Motor position	All positions	
Operating voltage	2.2~3.6V DC	
Operating conditions	-30 ~ 70°C ordinary humidity	No condensation of moisture.
Storage conditions	-40 ~ 80°C, ordinary humidity	No condensation of moisture.

Mechanical specifications

Items	Specifications	Condition & Remarks
Configuration	As specified in outline drawing	
Appearance	There shall be no evidence of mechanical damage and shall not have inadequate corrosion, etc.	Visual examination: Inspection carried out on samples.
Shaft end play	0.05 mm ~ 0.2 mm Max	
Mass	1.23g approx.	
Holding strength of vibration weight	49N (5kgf)	



Performance and characteristics

Items	Specifications	Condition & Remarks
Rated speed	12,000 @ 2,500 rpm	At rated voltage and rated load (vibration weight).
Rated current	90mA max	
Stall current	120mA max	At rated voltage.
Starting voltage	2.0V DC max	At rated load (vibration weight) any position of rotor.
Insulation resistance	1MΩ min	At DC 100V between the lead wires and motor body.
Terminal resistance	2Ω approx.	At 20c
Mechanical noise	50db (A) max	
Measured at rated voltage and rated load (vibration weight). Background noise: 28db (A) max. @ 10cm. Measuring instruments: B & K. The weight of jig: 700g.		

Mini DC motor



Specifications

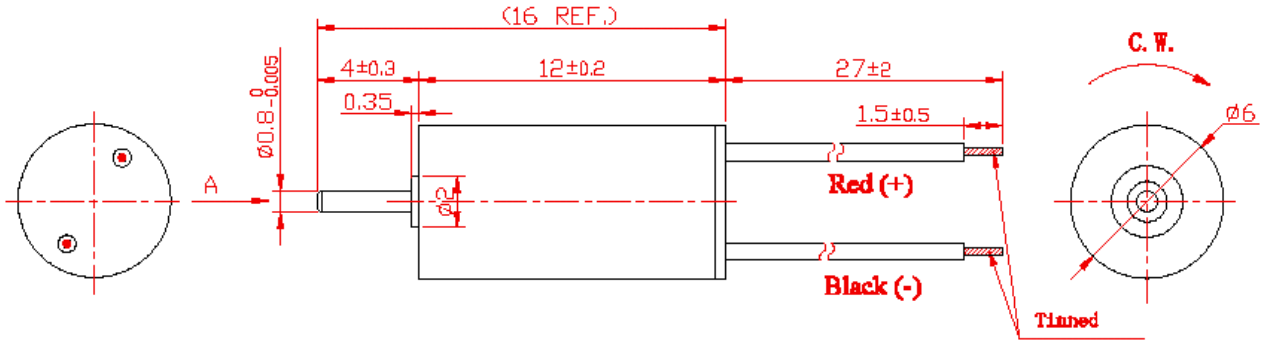
Nominal Voltage	Starting Voltage	Current		Normal Speed	Starting Current	Armature Resistance
		Avg. (mA)	Max. (mA)			
V DC.	V DC.			rpm	mA	Ω
1.3	0.6	30	35	16000	<150	7

Operating conditions

Items	Specifications	Condition & Remarks
Rated voltage	See Item 8	
No load speed	See Item 8	
Direction of rotation	C.W. (clockwise)	
Motor posture	All positions	
Operating voltage	0.9 ~ 1.6V DC	
Operating conditions	-20 ~ 60°C, 10 ~ 90% RH	
Storage conditions	-40 ~ 80°C, 5 ~ 95% RH	No condensation of moisture.

Mechanical specifications

Items	Specifications	Condition & Remarks
Configuration	As specified in outline drawing	Outline drawing below
Appearance	No evident mechanical damage and inadequate corrosion.	Visual examination on samples.
Shaft end play	0.1 ~ 0.3mm	
Weight of motor	1.30g approx.	



Performance and characteristics

Items	Specifications	Condition & Remarks
No load speed	See Item 8	At rated voltage
No load current	See Item 8	At rated voltage
Stall current	See Item 8	At rated voltage
Starting voltage	See Item 8	
Terminal resistance	See Item 8	At 20 癈
Mechanical noise	35db avg./ 50db (A) max	

Cautions and matters for motors

9-1 Warnings: In a motor near the end its life, or under breakdown conditions, short circuits can develop between commutator segments. Uncontrolled voltage may then leak into the power source circuit. Motors may overheat or fail if run continuously with its rotor locked condition or under excessive loads.

9-2 Destructive atmospheres: Do not use and store the motor in the corrosive gas atmosphere (H_2S , SO_2 , NO_2 , Cl_2 , etc.), or substances that can emit toxic gases, such as organic silicon, cyanide, formalin, or phenol compounds. The motor may get serious damages.

9-3 Condensation: Condensation on the electrical circuits can destroy the motor or control circuits. Monitor the environment and undertake measures to prevent condensation, such as installing condensation sensors to cut power when necessary.

9-4 Some particular plastic materials can crack and fail after exposure to motor bearing oil. Perform test the motor in/on the subassembly to check the influence of the oiled plastic parts.

-
- 9-5** Avoid connecting a serial resistor to the motor if at all possible, as this can negatively affect reliability. If this is unavoidable, keep resistance as low as possible and test thoroughly for reliability before using.
- 9-6** When testing for UL, CSA or other safety standards, apply for approval for the entire subassembly.
- 9-7** Do not store motors under conditions of extreme temperatures or high humidity, or for longer than six months even room conditions. When removing out of packaging after storage, take precautions to prevent condensation.
- 9-8 Connections:** Complete soldering operations within three seconds to prevent damage to leads and terminals. Make sure that the soldering tip does not exceed 350°C. Be gentle with terminals; dents or pressure on them can lock up the motor.
- 9-9** Please consults us in advance when design considerations call for forcefully stalling the motor using a short circuit at the terminal or reverse voltage. Such operations can shorten product life.

Photoresistor

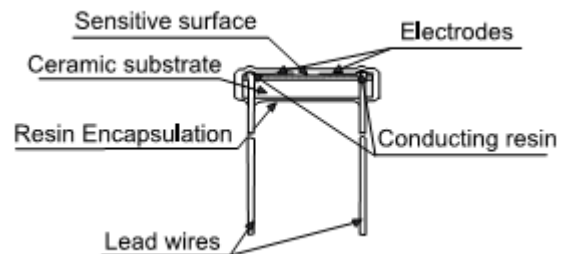
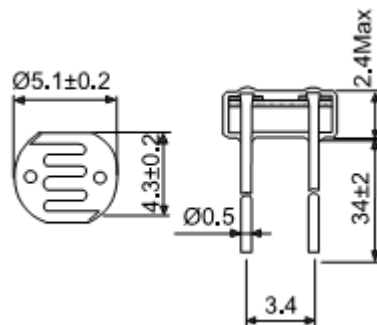


A photoresistor or light dependent resistor or cadmium sulfide (CdS) cell is a [resistor](#) whose [resistance](#) decreases with increasing incident light intensity. It can also be referenced as a photoconductor.

A photoresistor is made of a high resistance [semiconductor](#). If light falling on the device is of high enough [frequency](#), [photons](#) absorbed by the semiconductor give bound [electrons](#) enough energy to jump into the [conduction band](#). The resulting free electron (and its [hole](#) partner) conduct electricity, thereby lowering [resistance](#).

Applications:

- Auto flash for cameras
- Industrial Control
- Photoelectric Control
- Photo switch
- Room light control
- Photo lamp
- Photo musical I. C.
- Electronic toys



Model	V _{max} (VDC)	P _{max} (mW)	Ambient Temp (°C)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)min	γ min	ResponseTime (ms)	
								Rise	Decay
PGM5537	150	100	-30 ~ +70	540	16 ~ 50	2.0	0.7	20	30

