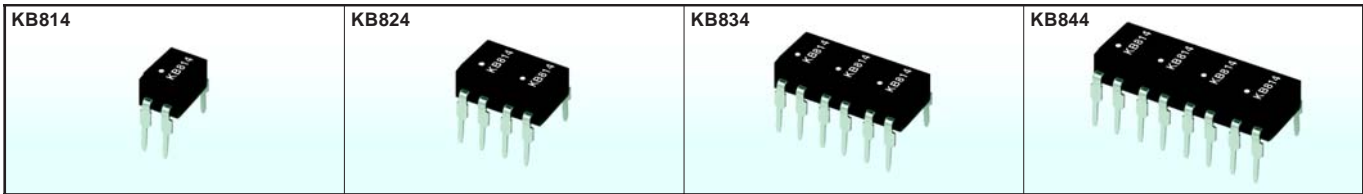
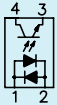
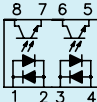
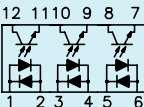
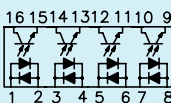


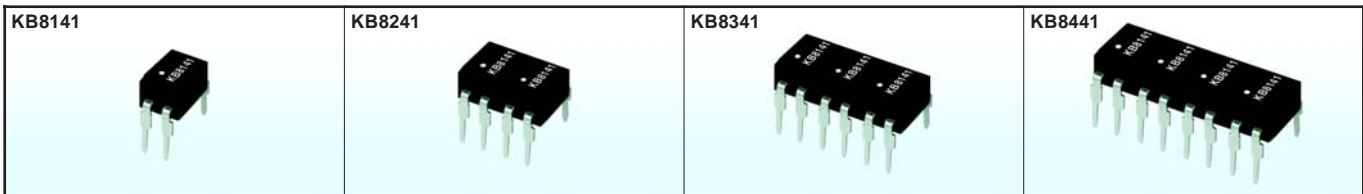
Kingbright

2007-2009

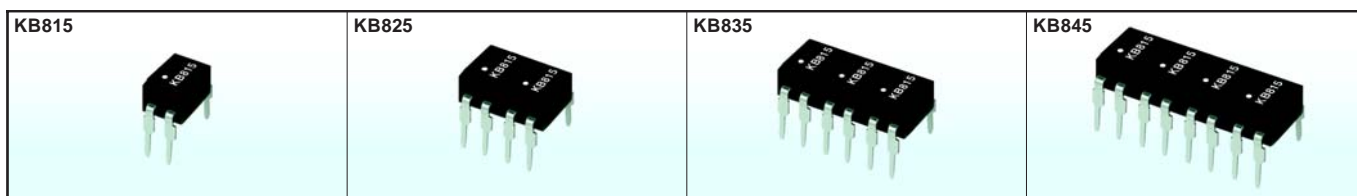
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|---------|-------------------------------------|
| P 2- 8 | PHOTOCOUPLERS |
| P 9-10 | PHOTO REFLECTIVE SENSOR & PHOTOLINK |
| P 11-16 | PHOTO INTERRUPTERS |
| P 17 | INFRARED RECEIVER MODULE |



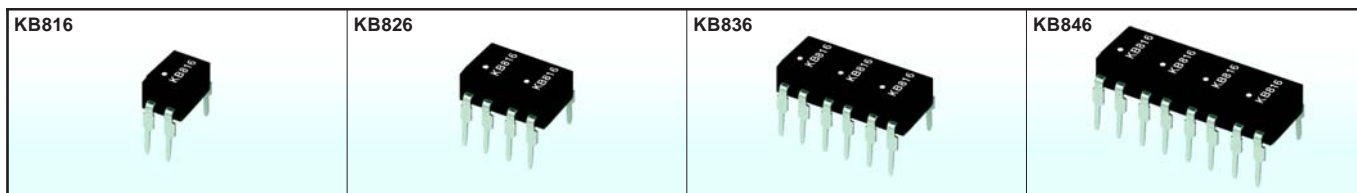
| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------|----------------------------------|-----------------------------------|----------------------------|------|------------------|------|-------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCE0(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | IF=±1mA, VCE=5V | | IF=±20mA, IC=1mA | | VCE=2V, IC=2mA, RL=100Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB814 |  | UL NO.E225308 & VDE0884. NO.40006364 | High isolation voltage AC input response | 5000 | 35 | 20 | 300 | 0.1 | 0.2 | 4 | 3 | 1 |
| KB824 |  | | | | | | | | | | | 2 |
| KB834 |  | | | | | | | | | | | 3 |
| KB844 |  | | | | | | | | | | | 4 |



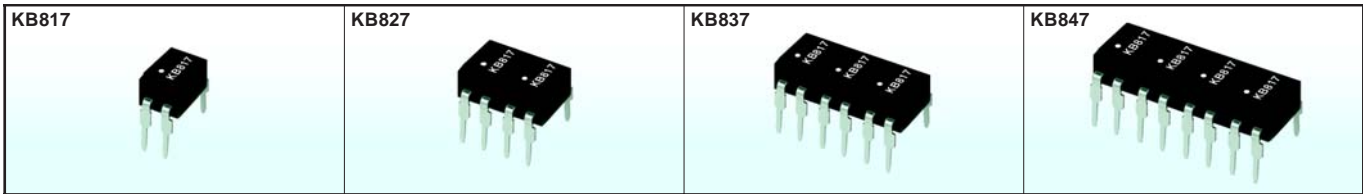
| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|-------------------|--------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------|--------------------------------------|----------------------------|------|------------------|------|---------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCEo(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | IF=±1mA, VCE=2V | | IF=±20mA, IC=5mA | | VCE=2V, IC=10mA, RL=100W | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB8141 | | UL NO.E225308 & VDE0884. NO.40006364 | High isolation voltage High sensitivity AC input response | 5000 | 35 | 600 | 7500 | 0.8 | 1 | 60 | 53 | 1 |
| KB8241 | | | | | | | | | | | | 2 |
| KB8341 | | | | | | | | | | | | 3 |
| KB8441 | | | | | | | | | | | | 4 |


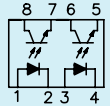
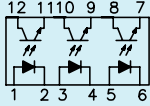
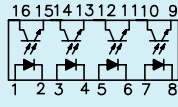


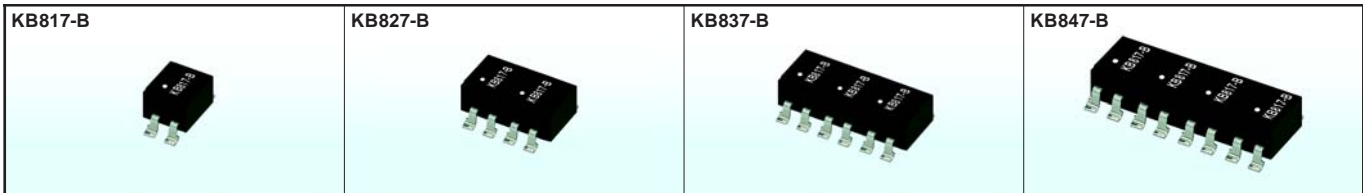
| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|-------------------|--------------------------------------------------|--------------------------------------------|----------------------------------|-----------------------------------|----------------------------|------|-----------------|------|--------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCEo(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | IF= 1mA, VCE=2V | | IF=20mA, IC=5mA | | VCE=2V, IC=10mA, RL=100Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB815 | | UL NO.E225308 & VDE0884. NO.40006364 | High isolation voltage High sensitivity | 5000 | 35 | 600 | 7500 | 0.8 | 1 | 60 | 53 | 1 |
| KB825 | | | | | | | | | | | | 2 |
| KB835 | | | | | | | | | | | | 3 |
| KB845 | | | | | | | | | | | | 4 |

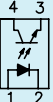
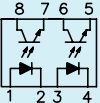
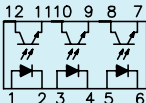
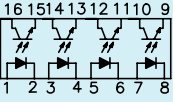





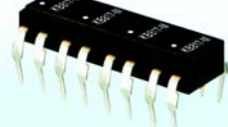

| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|-------------------|--------------------------------------|----------------------------------------------------------|----------------------------------|-----------------------------------|----------------------------|------|-----------------|------|-------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCEQ(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | IF=5mA, VCE=5V | | IF=20mA, IC=1mA | | VCE=2V, IC=2mA, RL=100Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB816 | | UL NO.E225308 & VDE0884. NO.40006364 | High isolation voltage High collector-emitter voltage | 5000 | 70 | 50 | 600 | 0.1 | 0.2 | 4 | 3 | 1 |
| KB826 | | | | | | | | | | | | 2 |
| KB836 | | | | | | | | | | | | 3 |
| KB846 | | | | | | | | | | | | 4 |



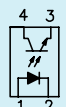
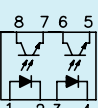
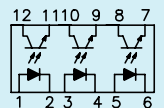


| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------|-------------------------------------|--------------------------------------|----------------------------|------|----------------|------|---------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCEo(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | If=5mA,VCE=5V | | If=20mA,Ic=1mA | | VCE=2V,Ic=2mA,RL=100Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB817 |  | UL NO.E225308 & VDE0884. NO.40006364 | High isolation voltage | 5000 | 35 | 50 | 600 | 0.1 | 0.2 | 4 | 3 | 1 |
| KB827 |  | | | | | | | | | | | 2 |
| KB837 |  | | | | | | | | | | | 3 |
| KB847 |  | | | | | | | | | | | 4 |



| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|-------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------|-------------------------------------|--------------------------------------|----------------------------|------|-----------------|------|---------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCEO(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | IF=5mA, VCE=5V | | IF=20mA, IC=1mA | | VCE=2V, IC=2mA, RL=100Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB817-B |  | UL NO.E225308 & VDE0884. NO.40006364 | High isolation voltage SMD Type | 5000 | 35 | 50 | 600 | 0.1 | 0.2 | 4 | 3 | 5 |
| KB827-B |  | | | | | | | | | | | 6 |
| KB837-B |  | | | | | | | | | | | 7 |
| KB847-B |  | | | | | | | | | | | 8 |

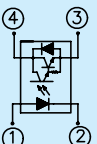
| | | | | |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| KB817-M | KB827-M | KB837-M | KB847-M | KB851 |
|  |  |  |  |  |






| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|-------------------|------------------|----------|-------------------------------------|-------------------------------------|----------------------------|------|-----------------|------|---------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCE(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | IF=5mA, VCE=5V | | IF=20mA, IC=1mA | | VCE=2V, IC=2mA, RL=100Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |

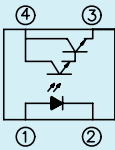
| | | | | | | | | | | | | |
|---------|-------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------|------|-----|----|-----|-----|-----|---|---|----|
| KB817-M |  | UL NO.E225308 & VDE0884. NO.400063-64 | High isolation voltage | 5000 | 35 | 50 | 600 | 0.1 | 0.2 | 4 | 3 | 9 |
| KB827-M |  | | | | | | | | | | | 10 |
| KB837-M |  | | | | | | | | | | | 11 |
| KB847-M |  | | | | | | | | | | | 12 |
| KB851 |  | VDE0884. NO.400063-64 | High collector-emitter Voltage | 5000 | 350 | - | - | 0.1 | 0.3 | 4 | 3 | 1 |

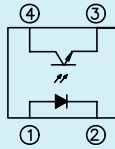
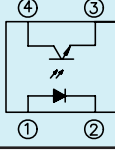
KB852

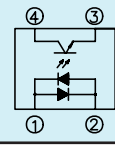


| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|-------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------|-------------------------------------|--------------------------------------|----------------------------|-------|-------------------|------|---------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCE0(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | If=1mA, VCE=2V | | If=20mA, Ic=100mA | | VCE=2V, Ic=20mA, RL=1000Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB852 |  | VDE0884. NO.400063-64 | High collector-emitter voltage High sensitivity | 5000 | 350 | 1000 | 15000 | - | 1.2 | 100 | 20 | 1 |

| KB355NT | | KB356NT | | KB357NT | | KB354NT | | KB3541NT | |
|-----------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------|--|
|  | |  | |  | |  | |  | |

| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|-----------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------|-------------------------------------|--------------------------------------|----------------------------|------|----------------|------|---------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCEO(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | IF=1mA,VCE=2V | | IF=20mA,IC=1mA | | VCE=2V,IC=2mA,RL=100Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB355NT |  | UL NO.E225308 & VDE0884. NO:40017614 | High current transfer ratio Small package size | 3750 | 35 | 600 | 7500 | 0.8 | 1.0 | 60 | 53 | 13 |

| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|-------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------------------|-------------------------------------|--------------------------------------|----------------------------|------|----------------|------|---------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCEO(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | IF=5mA,VCE=5V | | IF=20mA,IC=1mA | | VCE=2V,IC=2mA,RL=100Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB356NT |  | UL NO.E225308 & VDE0884. NO:40017614 | High collector-emitter Voltage Small package size | 3750 | 80 | 50 | 600 | 0.1 | 0.2 | 6 | 8 | 13 |
| KB357NT |  | | Small package size | 3750 | 35 | 50 | 600 | - | 0.2 | 4 | 3 | 13 |

| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|-------------------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-------------------------------------|--------------------------------------|----------------------------|------|-----------------|------|---------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCEO(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | IF=±1mA,VCE=5V | | IF=±20mA,IC=1mA | | VCE=2V,IC=2mA,RL=100Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB354NT |  | UL NO.E225308 & VDE0884. NO:40017614 | AC.input response Small package size | 3750 | 35 | 20 | 400 | 0.1 | 0.2 | 4 | 3 | 13 |

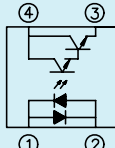
| Part No. | Pin Configuration | Safety Standards | Features | Absolute Maximum Ratings | | Electrical Characteristics | | | | | | Fig. |
|----------|-------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------|-------------------------------------|--------------------------------------|----------------------------|------|-----------------|------|---------------------------|----|------|
| | | | | Isolation Voltage(AC) Viso(Vrms) | Collector Emitter Voltage VCEO(V) | CTR(%) | | V(sat) (V) | | Response time(μs) Typ. | | |
| | | | | | | IF=±1mA,VCE=2V | | IF=±20mA,IC=1mA | | VCE=2V,IC=2mA,RL=100Ω | | |
| | | | | | | Min. | Max. | Typ. | Max. | tr | tf | |
| KB3541NT |  | UL NO.E225308 & VDE0884. NO:40017614 | AC.input response High sensitivity Small package size | 3750 | 35 | 450 | 7400 | 0.8 | 1.0 | 60 | 53 | 13 |

Fig.1

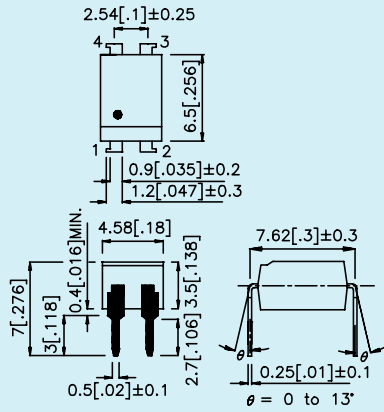


Fig.2

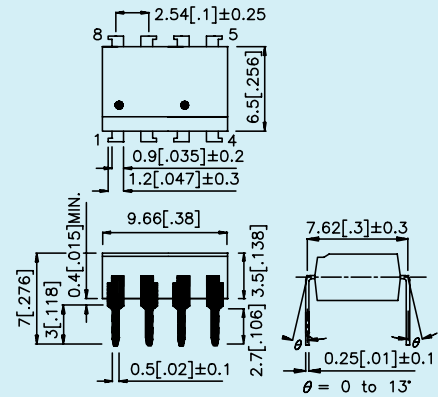


Fig.3

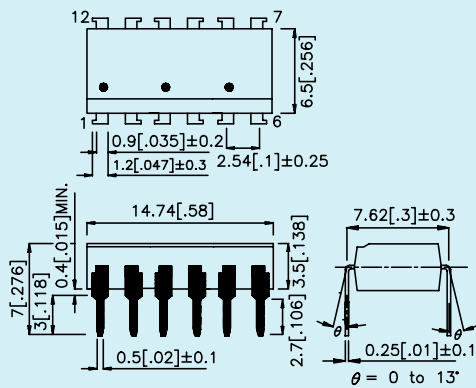


Fig.4

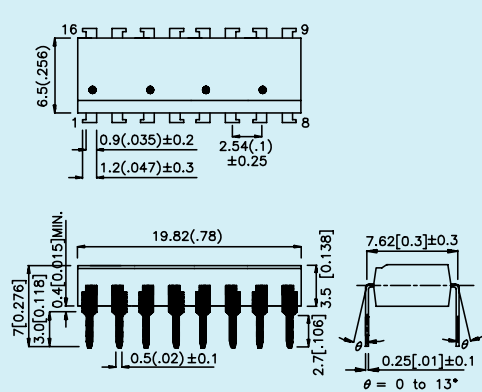


Fig.5

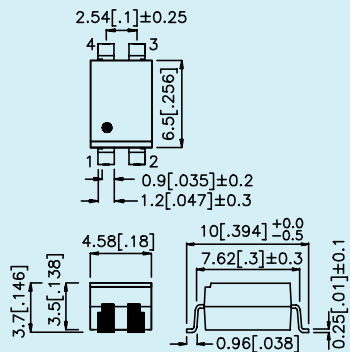


Fig.6

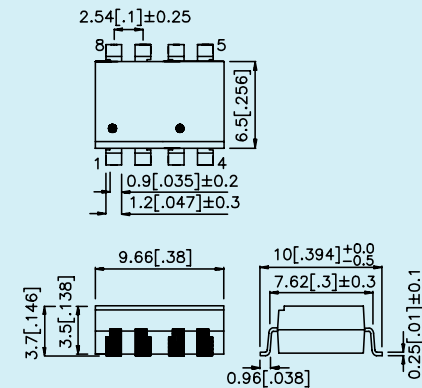


Fig.7

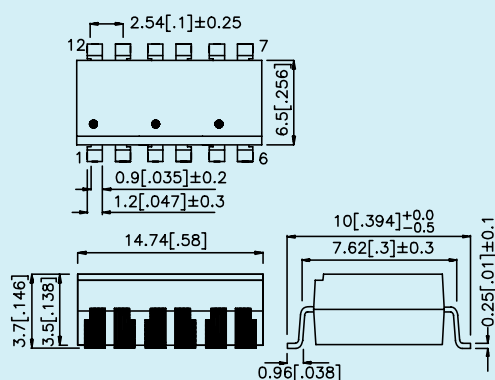
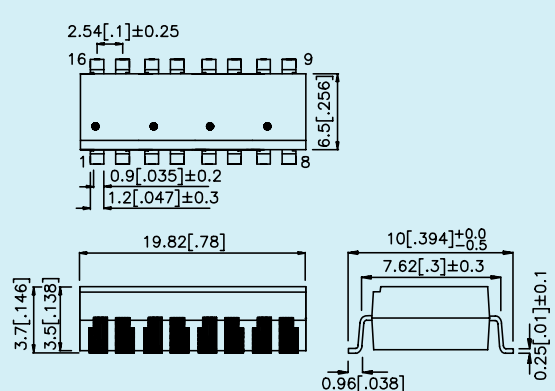


Fig.8



NOTES:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.5\text{mm}$ ($0.02''$) unless otherwise noted.

Fig.9

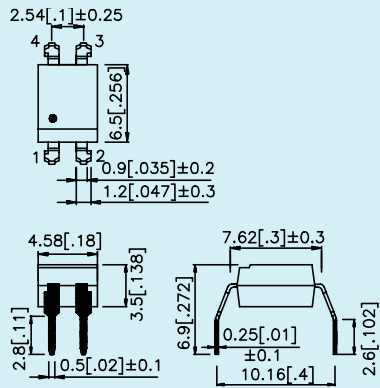


Fig.10

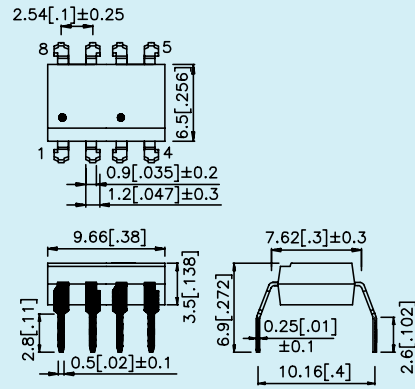


Fig.11

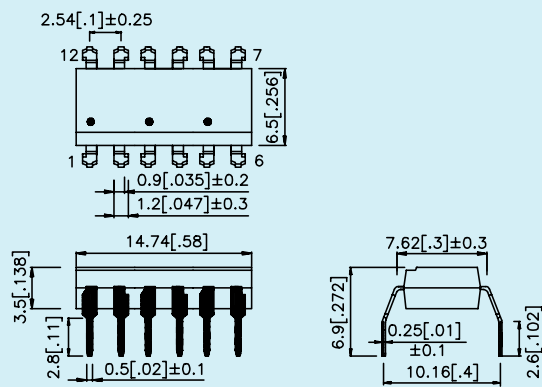


Fig.12

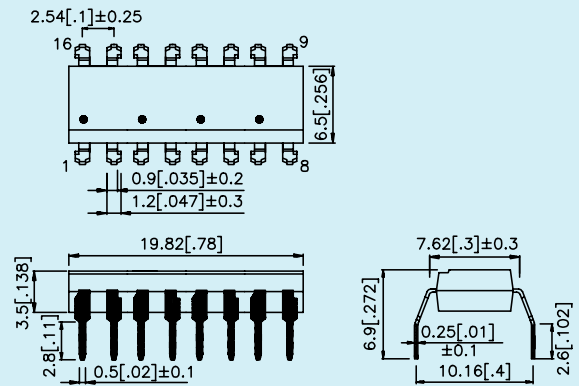
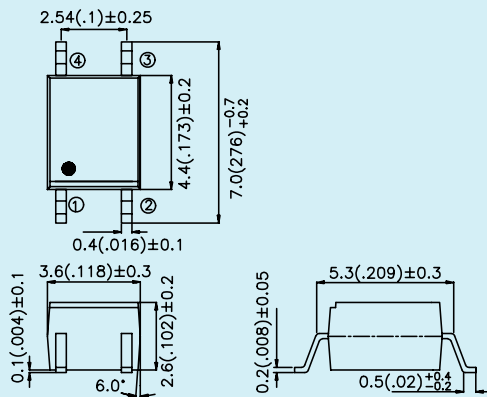






Fig.13

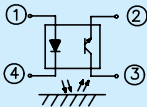
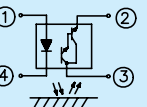
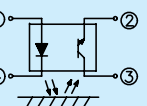
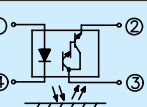
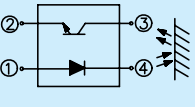
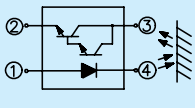


NOTES:

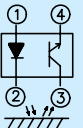
1. All dimensions are in millimeters(inches).
2. Tolerance is $\pm 0.5\text{mm}(0.02")$ unless otherwise noted.

| | | | |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| KTIR0711S & 0721DS | KTIR0811S & 0821DS | KTIR0A11S & 0A21DS | KRC011 |
|  |  |  |  |

| Part No. | Pin Configuration | Material | λ P (nm) | I_C (μA) | | | $V_{CE(SAT)}$ | | | Rise Time (μs) Typ. | Fall Time (μs) Typ. | Fig. |
|----------|-------------------|----------|---------------------|----------------------|------|------|---------------|-----------|---------|-------------------------------|-------------------------------|------|
| | | | | $V_{CE}=2V, I_F=4mA$ | | | | | | | | |
| | | | | Min. | Typ. | Max. | $I_F(mA)$ | $I_C(mA)$ | Max.(V) | | | |

| | | | | | | | | | | | | |
|------------|-------------------------------------------------------------------------------------|----------|-----|----|------|-----|---|---|---|----|----|---|
| KTIR0711S |  | GaAs/SiC | 940 | 10 | - | 400 | - | - | - | 20 | 20 | 1 |
| KTIR0721DS |  | GaAs/SiC | 940 | - | 3000 | - | - | - | - | 80 | 70 | |
| KTIR0811S |  | GaAs/SiC | 940 | 10 | - | 400 | - | - | - | 20 | 20 | 2 |
| KTIR0821DS |  | GaAs/SiC | 940 | - | 3000 | - | - | - | - | 80 | 70 | |
| KTIR0A11S |  | GaAs/SiC | 940 | 10 | - | 400 | - | - | - | 20 | 20 | 3 |
| KTIR0A21DS |  | GaAs/SiC | 940 | - | 3000 | - | - | - | - | 80 | 70 | |

| Part No. | Pin Configuration | Material | λ P (nm) | I_C (μA) | | | $V_{CE(SAT)}$ | | | Rise Time (μs) Typ. | Fall Time (μs) Typ. | Fig. |
|----------|-------------------|----------|---------------------|-----------------------|------|------|---------------|-----------|---------|-------------------------------|-------------------------------|------|
| | | | | $V_{CE}=5V, I_F=20mA$ | | | | | | | | |
| | | | | Min. | Typ. | Max. | $I_F(mA)$ | $I_C(mA)$ | Max.(V) | | | |

| | | | | | | | | | | | | |
|--------|-------------------------------------------------------------------------------------|----------|-----|----|---|-----|---|---|---|----|----|---|
| KRC011 |  | GaAs/SiC | 940 | 10 | - | 300 | - | - | - | 20 | 20 | 4 |
|--------|-------------------------------------------------------------------------------------|----------|-----|----|---|-----|---|---|---|----|----|---|

The drawing shows the mechanical specifications for the 2SD1505 package. The top view (left) shows a rectangular package with a central cutout. Dimensions include a top width of $0.5[.02] \pm 0.05$ mm, a top cutout width of $2[.079]$ mm, a top cutout depth of 0.35 mm, a central cutout width of $1.8[.071]$ mm, a central cutout depth of 0.106 mm, a bottom width of $2.7[.106]$ mm, and a bottom cutout width of $3.4[0.134] \pm 0.20$ mm. The side view (right) shows a package with a maximum height of $4.5[0.177] \pm 0.5$ mm, a top width of $0.65[0.026]$ mm, a top cutout width of $0.4[.016] \pm 0.05$ mm, a central cutout width of $0.5[.02] \text{ MAX.}$ mm, a central cutout depth of $0.15[.006]$ mm, and a bottom width of $1.5[0.06]$ mm. The package is labeled with ① Anode, ② Emitter, ③ Collector, and ④ Cathode.

Technical drawings of the 6X4 vacuum tube pinout and mechanical dimensions.

Pinout Legend:

- ① Anode
- ② Emitter
- ③ Collector
- ④ Cathode

Pinout Drawing (Top Left): Shows the internal structure with dimensions: $2.7[.106] \pm 0.1$, 0.35 , $2[.079]$, $1.8[.07]$, and $2.7[.106]$.

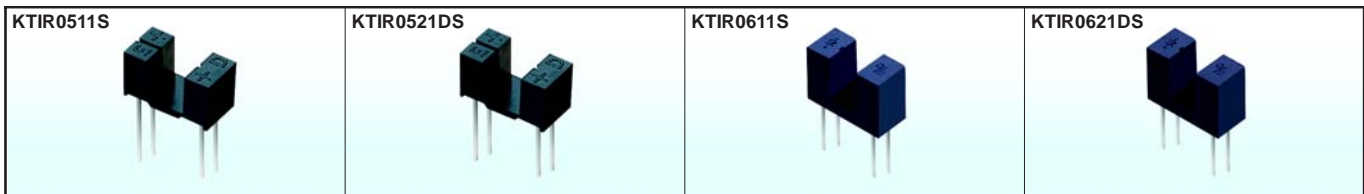
Mechanical Drawing (Bottom Left): Shows the base dimensions: $3.4[.134] \pm 0.2$, $1.5[.06]^{+0.20}_{-0.00}$, $0.65[.026]$, $0.5[.02]$, $\pm 15^\circ$, and $10[.394]$.

Mechanical Drawing (Bottom Right): Shows the base dimensions: $3.7[.146] \pm 0.2$, $0.15[.006]$, and $\theta : 0 \text{ to } 20^\circ$.

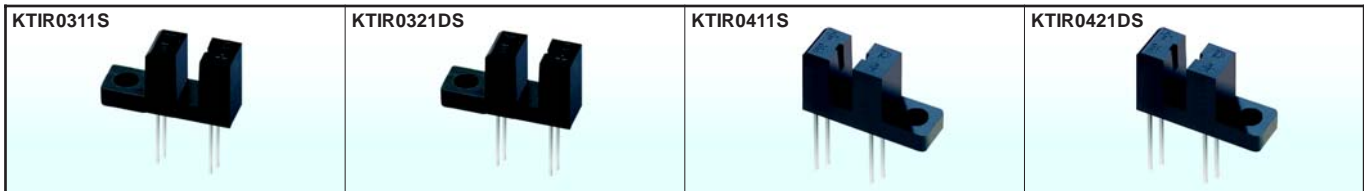
①:ANODE
②:CATHODE
③:COLLECTOR
④:EMITTER

NOTES:



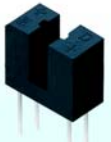
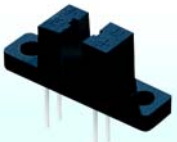
1. All dimensions are in millimeters(inches).
2. Tolerance is $\pm 0.25\text{mm}(0.01")$ unless otherwise noted.


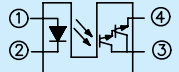
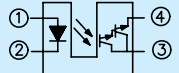
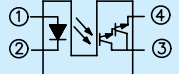






| Part No. | Pin Configuration | Material | λ P (nm) | CTR | | | $V_{CE(SAT)}$ | | | Rise Time (μ s) Typ. | Fall Time (μ s) Typ. | Fig. |
|------------|-------------------|----------|------------------|--------|-------------|---------|---------------|--------|---------|------------------------------|------------------------------|------|
| | | | | IF(mA) | $V_{CE(V)}$ | Typ.(%) | IF(mA) | IC(mA) | Max.(V) | | | |
| KTIR0511S | | GaAs/SiC | 940 | 20 | 5 | 10 | 40 | 1 | 0.4 | 5 | 4 | 6 |
| KTIR0521DS | | GaAs/SiC | 940 | 1 | 2 | 180 | 2 | 1 | 1 | 90 | 80 | 7 |
| KTIR0611S | | GaAs/SiC | 940 | 20 | 5 | 14 | 40 | 1 | 0.4 | 5 | 4 | 8 |
| KTIR0621DS | | GaAs/SiC | 940 | 1 | 2 | 200 | 2 | 1 | 1 | 90 | 80 | 9 |

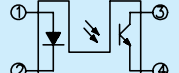
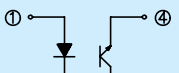
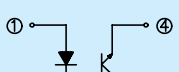
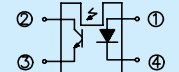



| Part No. | Pin Configuration | Material | λ P (nm) | CTR | | | $V_{CE(SAT)}$ | | | Rise Time (μ s) Typ. | Fall Time (μ s) Typ. | Fig. |
|------------|-------------------|----------|------------------|--------|-------------|---------|---------------|--------|---------|------------------------------|------------------------------|------|
| | | | | IF(mA) | $V_{CE(V)}$ | Typ.(%) | IF(mA) | IC(mA) | Max.(V) | | | |
| KTIR0311S | | GaAs/SiC | 940 | 20 | 5 | 38 | 40 | 1 | 0.4 | 5 | 4 | 10 |
| KTIR0321DS | | GaAs/SiC | 940 | 1 | 2 | 650 | 2 | 1 | 1 | 90 | 80 | 11 |
| KTIR0411S | | GaAs/SiC | 940 | 20 | 5 | 38 | 40 | 1 | 0.4 | 5 | 4 | 12 |
| KTIR0421DS | | GaAs/SiC | 940 | 1 | 2 | 650 | 2 | 1 | 1 | 90 | 80 | 13 |

| | | | |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| KTIR0911S | KTIR0921DS | KTIR0121DS | KTIR0221DS |
|  |  |  |  |

| Part No. | Pin Configuration | Material | λ P (nm) | CTR | | | $V_{CE(SAT)}$ | | | Rise Time (μ s) Typ. | Fall Time (μ s) Typ. | Fig. |
|------------|------------------------------------------------------------------------------------|----------|------------------|--------|-------------|---------|---------------|--------|---------|------------------------------|------------------------------|------|
| | | | | IF(mA) | $V_{CE(V)}$ | Typ.(%) | IF(mA) | IC(mA) | Max.(V) | | | |
| KTIR0911S |  | GaAs/SiC | 940 | 20 | 5 | 9.5 | 40 | 1 | 0.4 | 5 | 4 | 14 |
| KTIR0921DS |  | GaAs/SiC | 940 | 1 | 2 | 120 | 2 | 1 | 1 | 90 | 80 | 15 |
| KTIR0121DS |  | GaAs/SiC | 940 | 1 | 2 | 600 | 2 | 1 | 1 | 90 | 80 | 16 |
| KTIR0221DS |  | GaAs/SiC | 940 | 1 | 2 | 600 | 2 | 1 | 1 | 90 | 80 | 17 |

| | | | |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| KRA011 | KRA021 | KRA031 | KRA041 |
|  |  |  |  |

| Part No. | Pin Configuration | Material | λ P (nm) | CTR | | | $V_{CE(SAT)}$ | | | Rise Time (μ s) Typ. | Fall Time (μ s) Typ. | Fig. |
|----------|-------------------------------------------------------------------------------------|----------|------------------|--------|-------------|---------|---------------|--------|---------|------------------------------|------------------------------|------|
| | | | | IF(mA) | $V_{CE(V)}$ | Typ.(%) | IF(mA) | IC(mA) | Max.(V) | | | |
| KRA011 |  | GaAs/SiC | 940 | 5 | 5 | 8 | 10 | 0.04 | 0.4 | 50 | 50 | 18 |
| KRA021 |  | GaAs/SiC | 940 | 10 | 2 | 18 | 20 | 0.25 | 0.4 | 15 | 15 | 19 |
| KRA031 |  | GaAs/SiC | 940 | 5 | 2 | 10 | 10 | 0.15 | 0.4 | 15 | 15 | 20 |
| KRA041 |  | GaAs/SiC | 940 | 5 | 2 | 6 | 10 | 0.4 | 0.4 | 15 | 15 | 21 |

| | | |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| KRB011  | KRB021  | KRB031  |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|

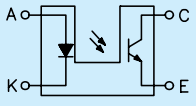
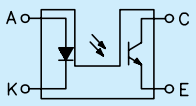
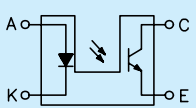
| Part No. | Pin Configuration | Material | λ P (nm) | CTR | | | $V_{CE(SAT)}$ | | | Rise Time (μ s) Typ. | Fall Time (μ s) Typ. | Fig. |
|----------|-----------------------------------------------------------------------------------|----------|------------------|--------|--------------|---------|---------------|--------|---------|------------------------------|------------------------------|------|
| | | | | IF(mA) | V_{CE} (V) | Typ.(%) | IF(mA) | IC(mA) | Max.(V) | | | |
| KRB011 |  | GaAs/SiC | 940 | 5 | 5 | 3 | 20 | 0.05 | 0.4 | 8 | 10 | 22 |
| KRB021 |  | GaAs/SiC | 940 | 5 | 5 | 3 | 20 | 0.05 | 0.4 | 8 | 10 | 23 |
| KRB031 |  | GaAs/SiC | 940 | 5 | 5 | 3 | 20 | 0.05 | 0.4 | 8 | 10 | 24 |

Fig.6

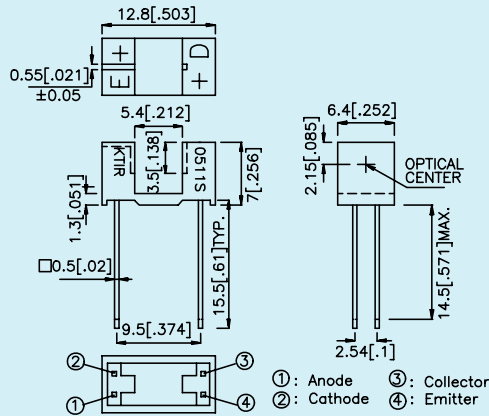


Fig.7

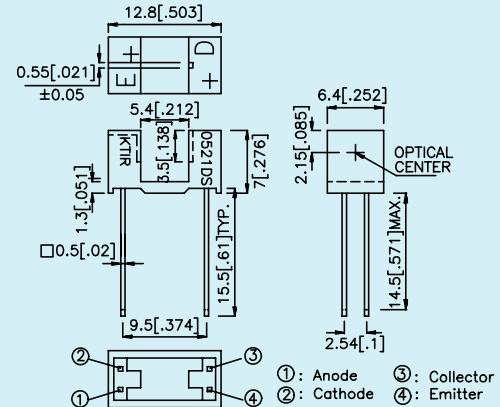


Fig.8

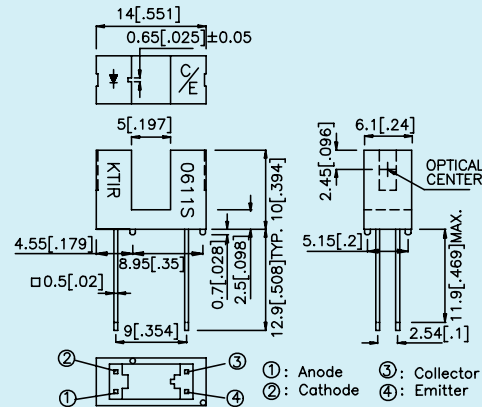


Fig.9

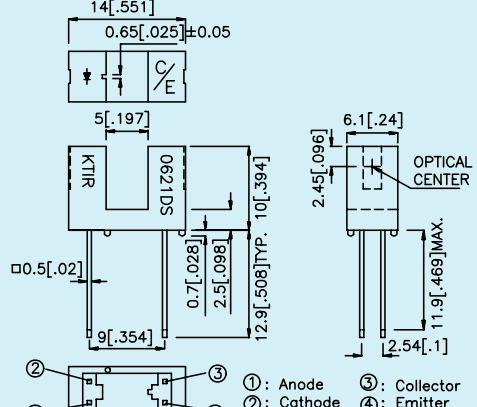


Fig.10

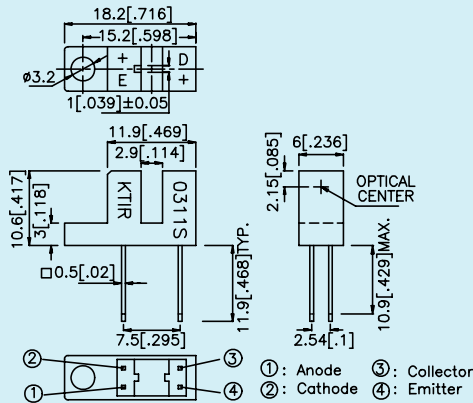


Fig.11

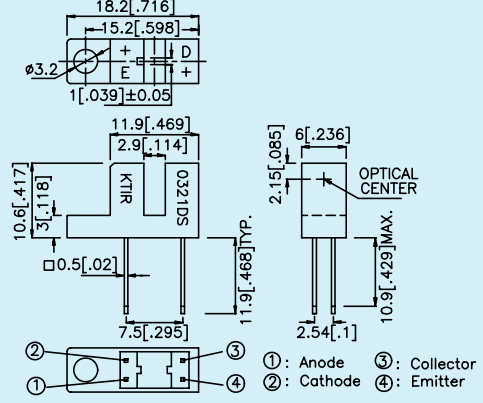


Fig.12

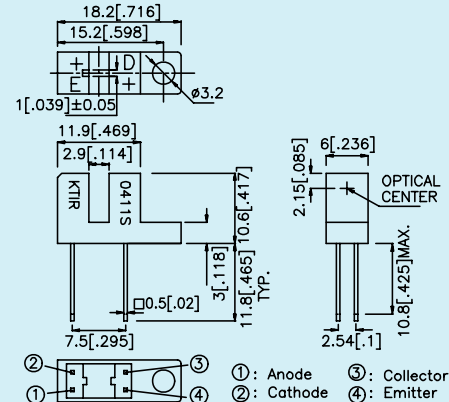
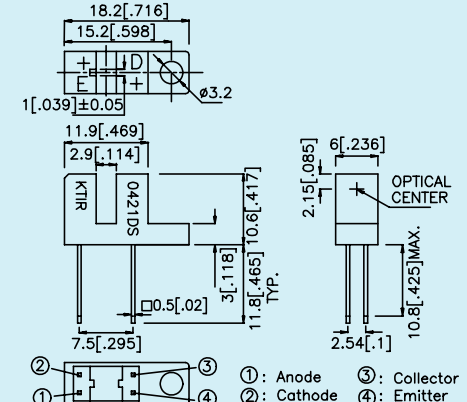


Fig.13



NOTES:

1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

Fig.14

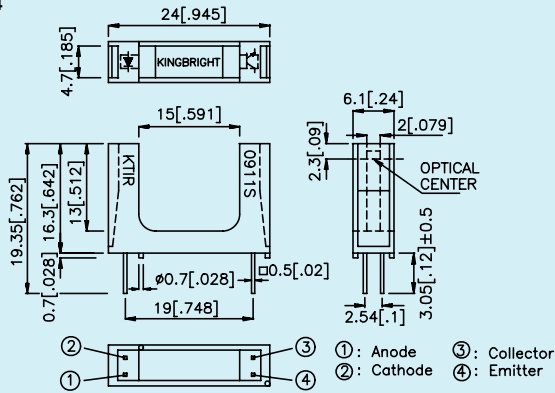


Fig.15

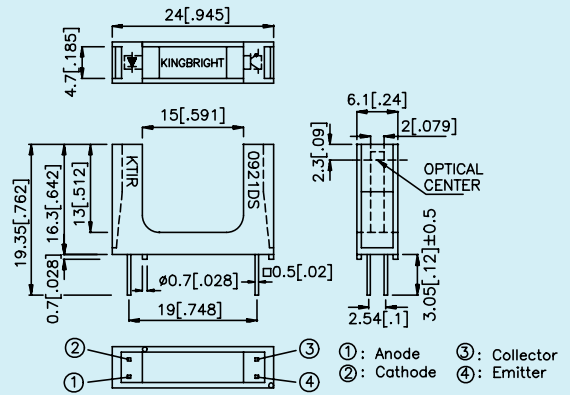


Fig.16

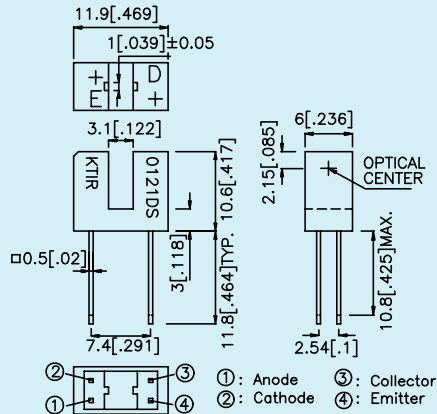


Fig.17

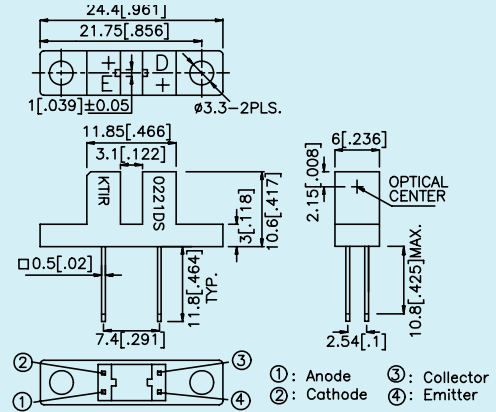


Fig.18

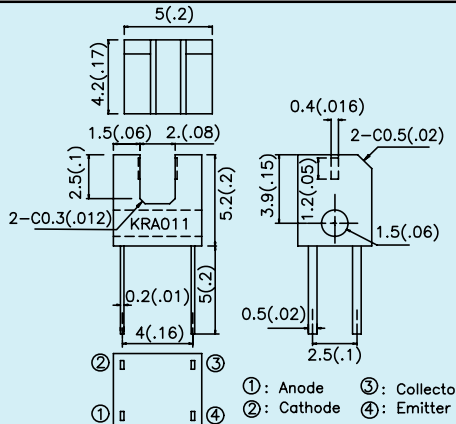


Fig.19

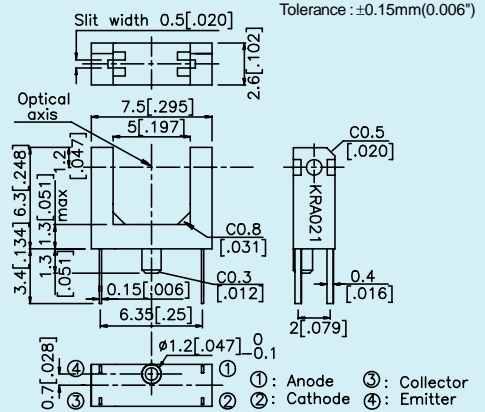


Fig.20

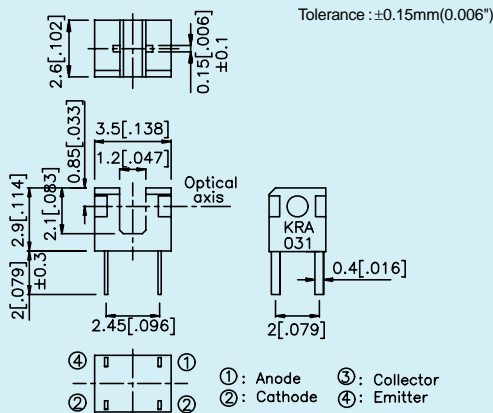
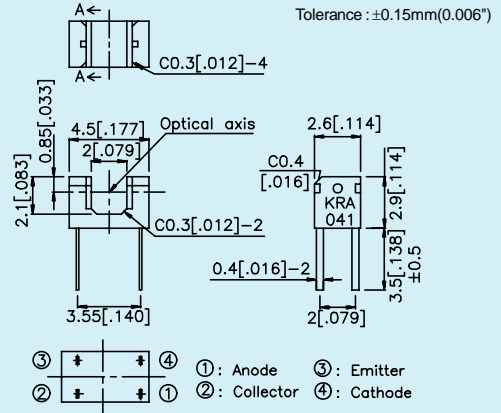


Fig.21



NOTES:

1. All dimensions are in millimeters(inches).
2. Tolerance is ±0.25mm(0.01") unless otherwise noted.

Fig.22

Tolerance : $\pm 0.15\text{mm}(0.006")$

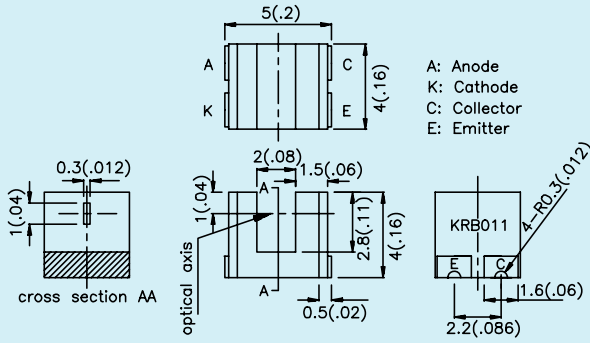


Fig.23

Tolerance : $\pm 0.15\text{mm}(0.006")$

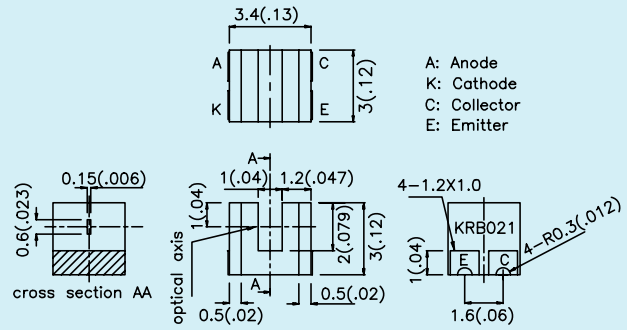


Fig.24

Tolerance : $\pm 0.15\text{mm}(0.006")$

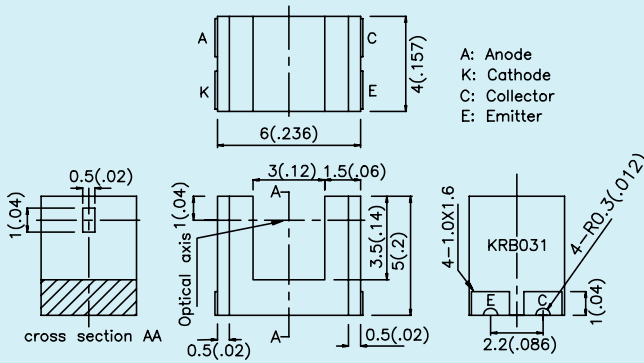


Fig.27

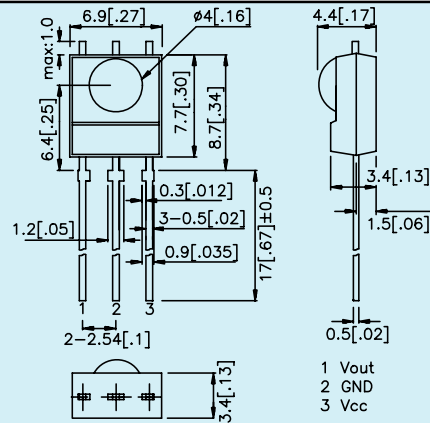


Fig.28

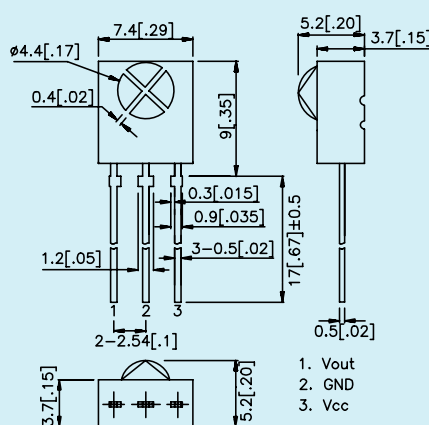


Fig.29

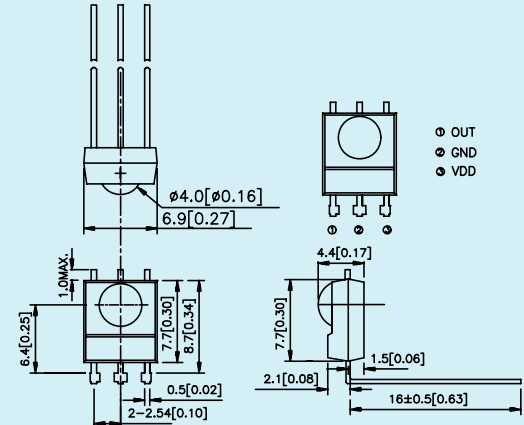
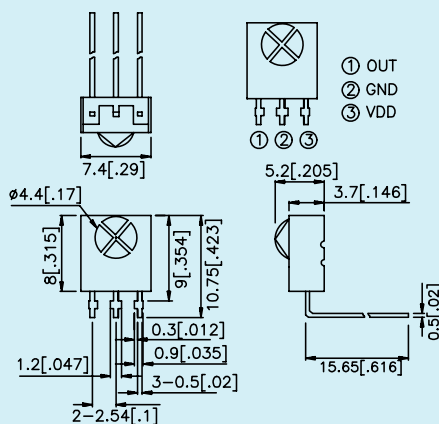
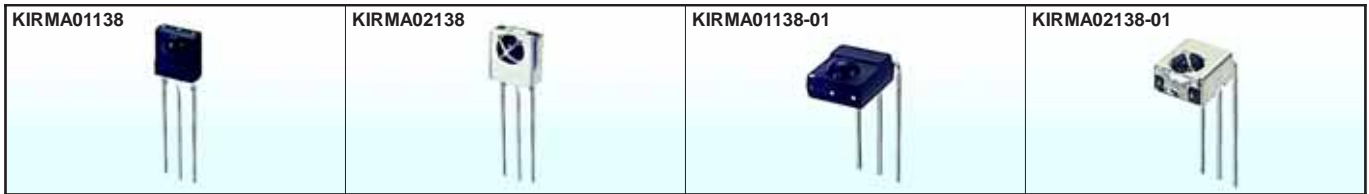


Fig.30



NOTES:

1. All dimensions are in millimeters(inches).
2. Tolerance is $\pm 0.25\text{mm}(0.01")$ unless otherwise noted.



| Part No. | Center Frequency | Supply Voltage | | Supply Current | Reception Distance | | Half Angle | Fig. |
|---------------|------------------|---------------------|------|------------------------------|----------------------------|-----------------------------|---------------|------|
| | Fc (kHz) Typ. | V _{cc} (V) | | I _{cc} (mA) Typ. | L ₀ (m) Min. | L ₄₅ (m) Min. | θ (°) Typ. | |
| | | Min. | Max. | | | | | |
| KIRMA01138 | 38 | 2.5 | 5.5 | 0.8 | 14 | 6 | +/-45 | 27 |
| KIRMA02138 | 38 | 2.5 | 5.5 | 0.8 | 14 | 6 | +/-45 | 28 |
| KIRMA01138-01 | 38 | 2.5 | 5.5 | 0.8 | 14 | 6 | +/-45 | 29 |
| KIRMA02138-01 | 38 | 2.5 | 5.5 | 0.8 | 14 | 6 | +/-45 | 30 |