



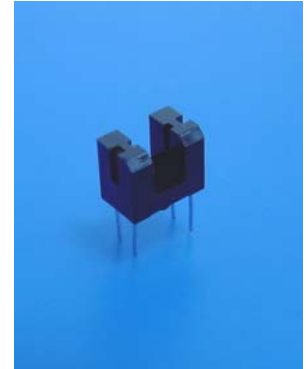
DS-352

■ **Features**

- Fast response time
- High sensitivity
- Thin and small package
- Pb free
- This product itself will remain within RoHS compliant version

■ **Descriptions**

The **DS-352** consists of an infrared emitting diode and a silicon phototransistor encased in a black thermo-plastic housing. The advantage of the device is the small package. Phototransistor receives radiation from the DR LED only, and avoids the noise from ambient light.



■ **Applications**

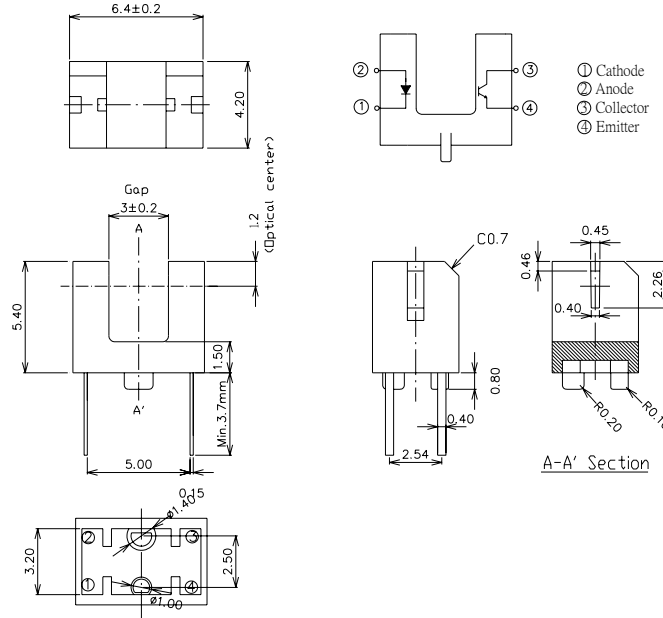
- Camera
- Copier
- Scanner
- Non-contact Switching

■ **Device Selection Guide**

Device No.	Chip Material
DR918	GaAlAs
DT918	Silicon



Package Dimensions



- Notes:** 1. All dimensions are in millimeters
 2. Tolerances unless dimensions ± 0.2 mm

Absolute Maximum Ratings ($T_a=25^\circ\text{C}$)

Parameter		Symbol	Ratings	Unit
Input	Power Dissipation at (or below) 25°C Free Air Temperature	P_d	75	mW
	Reverse Voltage	V_R	5	V
	Forward Current	I_F	50	mA
	Peak Forward Current (*1) Pulse width $\leq 100 \mu\text{s}$, Duty cycle=1%	I_{FP}	1	A
Output	Collector Power Dissipation	P_C	75	mW
	Collector Current	I_C	20	mA
	Collector-Emitter Voltage	B V_{CEO}	30	V
	Emitter-Collector Voltage	B V_{ECO}	5	V
Operating Temperature		T_{opr}	-25~+85	$^\circ\text{C}$
Storage Temperature		T_{stg}	-40~+85	$^\circ\text{C}$
Lead Soldering Temperature (*2)		T_{sol}	260	$^\circ\text{C}$

(*1) $t_w=100 \mu\text{sec.}$, $T=10 \text{msec.}$ (*2) $t=5 \text{Sec}$



Electro-Optical Characteristics (Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward Voltage	V_F	---	1.2	1.6	V	$I_F=20\text{mA}$
	Reverse Current	I_R	---	---	10	μA	$V_R=5\text{V}$
	Peak Wavelength	λ_P	---	940	---	nm	$I_F=20\text{mA}$
Output	Dark Current	I_{CEO}	---	1	100	nA	$V_{CE}=10\text{V}$
	C-E Saturation Voltage	$V_{CE(sat)}$	---	---	0.4	V	$I_C=2\text{mA}$ $E_e=1\text{mW/cm}^2$
Transfer Characteristics	Collector Current	$I_{C(ON)}$	0.2	---	5	mA	$V_{CE}=5\text{V}$, $I_F=20\text{mA}$
	Leakage Current	I_{CEOD}	---	---	1	μA	$V_{CE}=5\text{V}$ $I_F=20\text{mA}$
	Rise time	t_r	---	15	---	μsec	$V_{CE}=2\text{V}$ $I_C=1\text{mA}$ $R_L=1\text{K}\Omega$
	Fall time	t_f	---	15	---	μsec	



Typical Electrical/Optical/Characteristics Curves for DR

Fig.1 Forward Current vs. Ambient Temperature

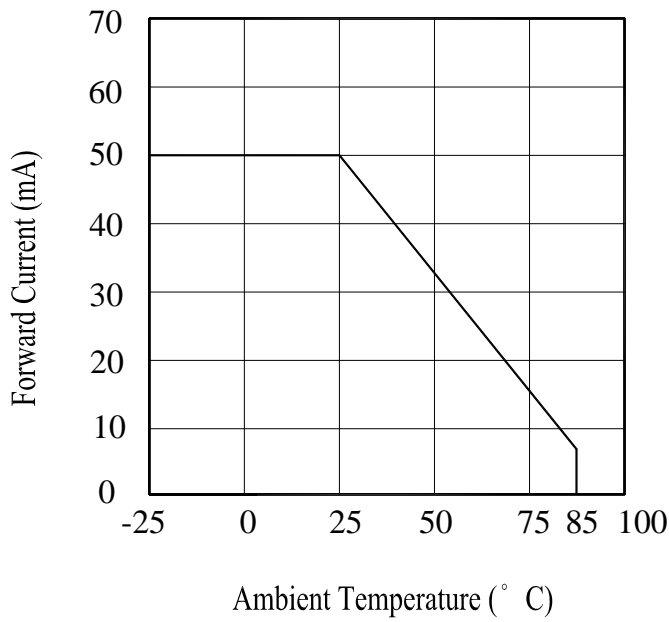


Fig.2 Spectral Distribution

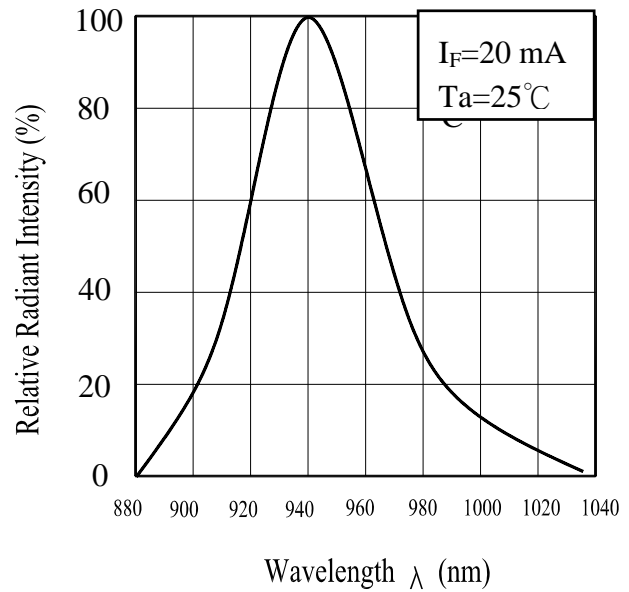


Fig.3 Peak Emission Wavelength vs. Ambient Temperature

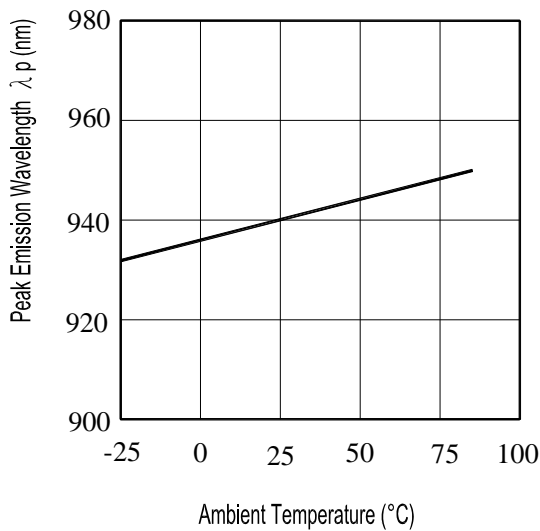


Fig.4 Forward Current vs. Forward Voltage

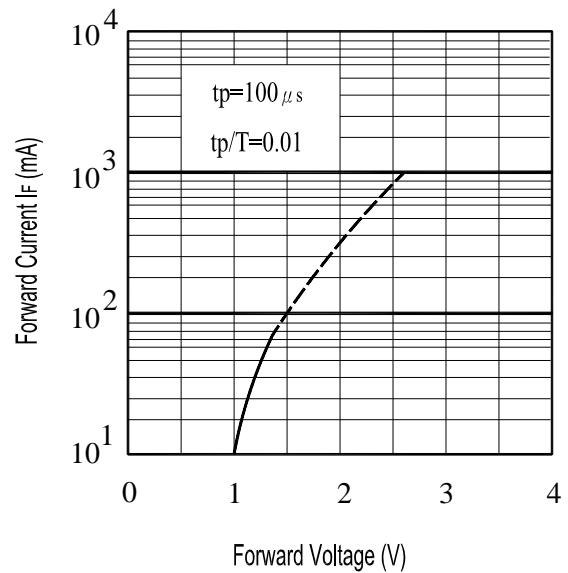




Fig.5 Forward Voltage vs. Ambient Temperature(°C)

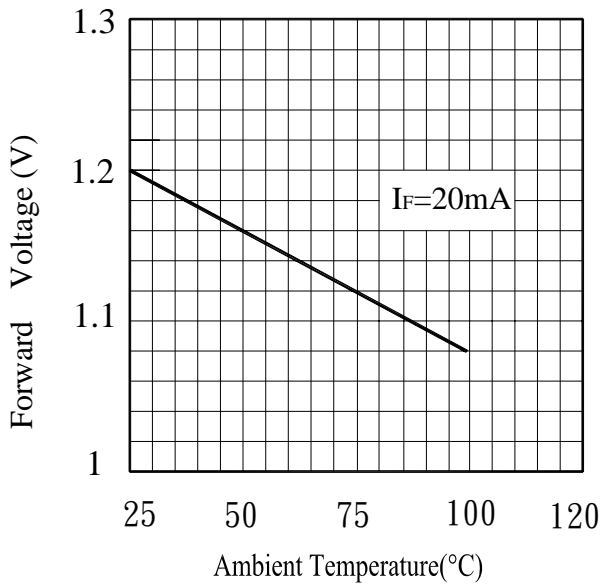
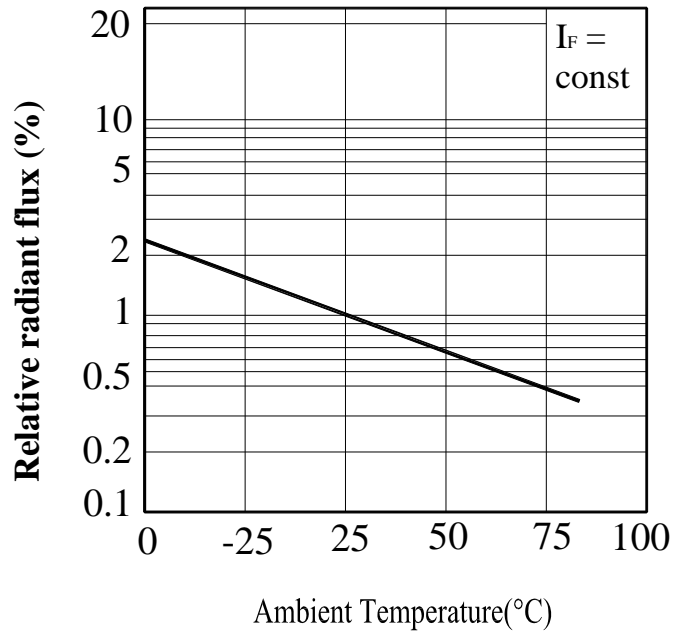


Fig.6 Relative Radiant Flux vs. Ambient Temperature(°C)





Typical Electrical/Optical/Characteristics Curves for DT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

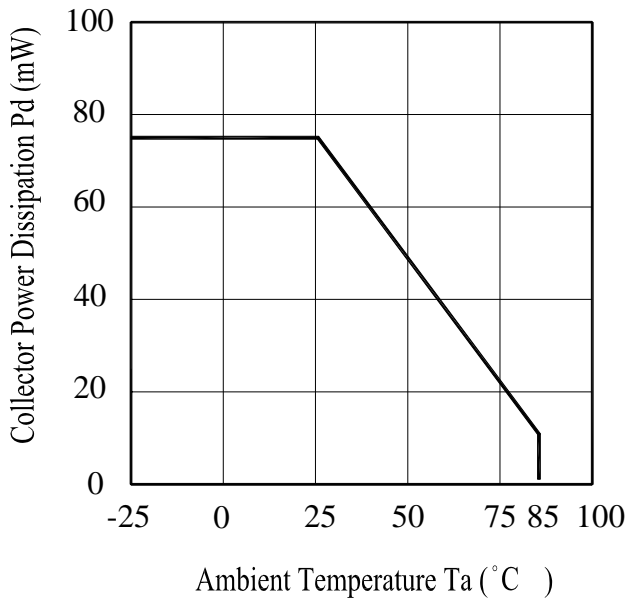


Fig.2 Spectral Sensitivity

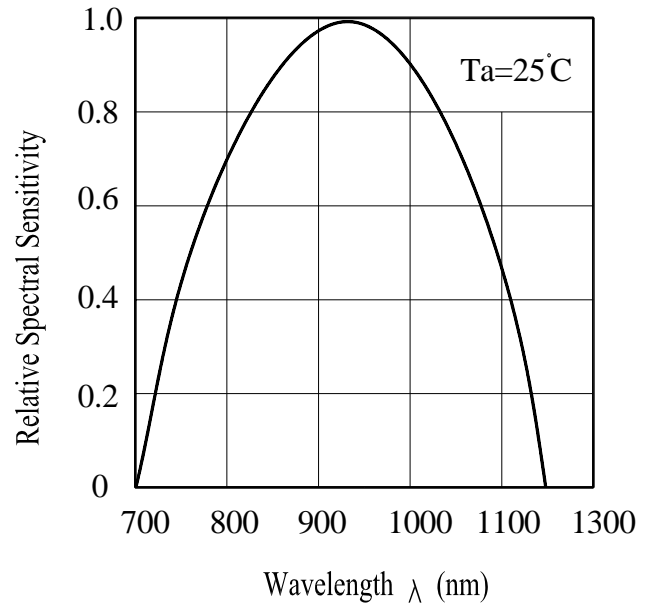


Fig.3. Collector Dark Current vs. Ambient Temperature

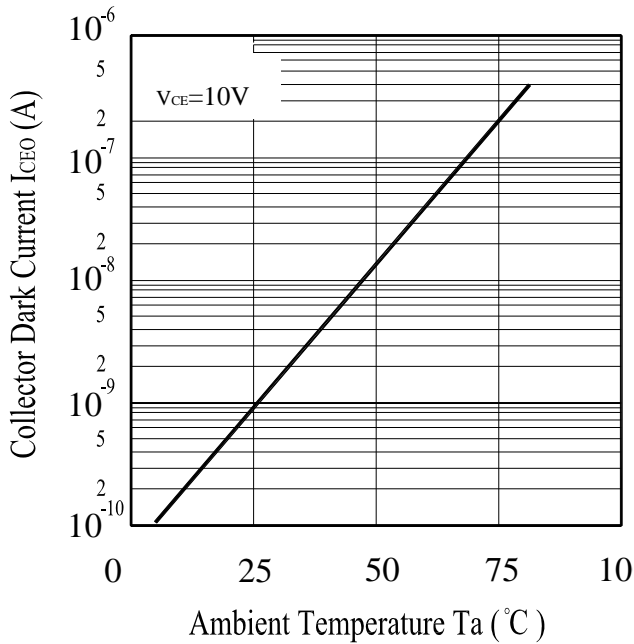
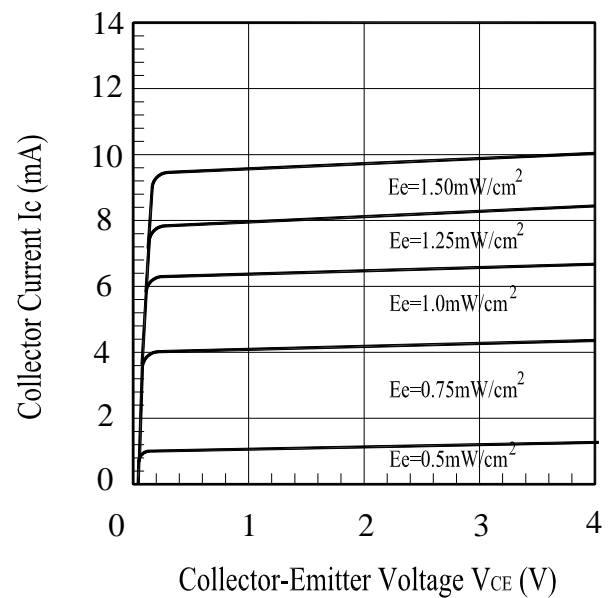


Fig.4 Collector Current vs. Collector-Emitter Voltage





Reliability Test Item And Condition

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

NO.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgment Criteria	Ac/Re
1	Solder Resistance	Ta = 260 ±5°C	10 sec	22pcs	$I_R \geq U \times 2$ $E_e \leq L \times 0.8$ $V_F \geq U \times 1.2$ U : Upper Specification Limit L : Lower Specification Limit	0/1
2	Temperature Cycle	H : +100°C 15mins ↑ 5mins ↓ L : -40°C 15mins	300Cycles	22pcs		0/1
3	Thermal Shock	H : +100°C 5mins ↑ 10secs ↓ L : -10°C 5mins	300Cycles	22pcs		0/1
4	High Temperature Storage	TEMP. : +100°C	1000hrs	22pcs		0/1
5	Low Temperature Storage	TEMP. : -40°C	1000hrs	22pcs		0/1
6	DC Operating Life	V _{CE} =5V	1000hrs	22pcs		0/1
7	High Temperature/ High Humidity	85°C / 85% R.H	1000hrs	22pcs		0/1