ON3161, ON3162 (Tentative), ON3163 (Tentative), ON3164 (Tentative)

Optoisolators

■ Outline

The ON3161 series is a small, high transfer ratio and high voltage optoisolator. Input/output insulation voltage is 5000V as mold method is applied and internal structure is designed used for high voltage.

■ Features

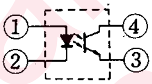
- High CTR: >50%
- High V_{ISO}: >5000V
- Fast response: t_r, t_f=4μs
- Low dark current: I_{CEO}<100nA
- Small package for saving mounting space
- Low CTR variation against change in temperature
- UL recognized File No. E79920 (M) (ON3161)

■ Use

- Solid state relay
- Elimination of ground loop and EMI/RFI problems associated differential ground.

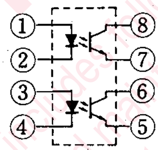
■ Pin Connection

ON3161



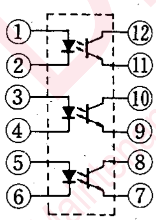
(Top View)

ON3162



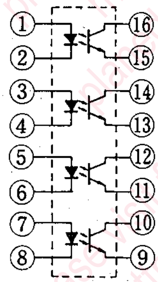
(Top View)

ON3163



(Top View)

ON3164

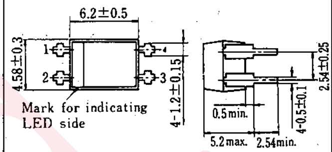


(Top View)

■ Absolute Maximum Ratings (Ta=25°C)

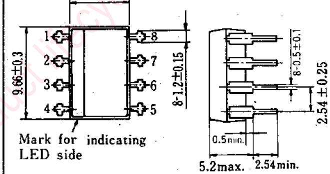
Item		Symbol	Value	Unit
Input (Light Emitting Diode)	Reverse Voltage (DC)	V_R	6	V
	Forward Current (DC)	I_F	50	mA
	Pulse Forward Current	I_{FP} *1	1	A
	Power Dissipation	P_D *2	75	mW

ON3161 Unit : mm



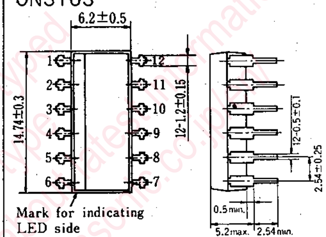
1 : Anode 3 : Emitted
2 : Cathode 4 : Collector

ON3162



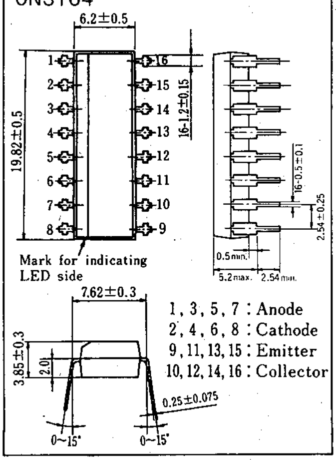
1, 3 : Anode 5, 7 : Emitter
2, 4 : Cathode 6, 8 : Collector

ON3163



1, 3, 5 : Anode
2, 4, 6 : Cathode
7, 9, 11 : Emitter
8, 10, 12 : Collector

ON3164



1, 3, 5, 7 : Anode
2, 4, 6, 8 : Cathode
9, 11, 13, 15 : Emitter
10, 12, 14, 16 : Collector

■ Absolute Maximum Ratings (Ta=25°C)

Item		Symbol	Value	Unit
Output (Photo Transistor)	Collector Current	I_C	50	mA
	Collector to Emitter Voltage	V_{CEO}	35	V
	Emitter to Collector Voltage	V_{ECO}	5	V
	Collector Power Dissipation	P_C *3	150	mW
Total Power Dissipation		P_T	200	mW
Operating Ambient Temperature		T_{opr}	−30～+100	℃
Storage Temperature		T_{stg}	−55～+125	℃

*1 Pulse width 1 μs, repeat 300 pps.
*2 Derate (0.75 mW/°C) above 25°C ambient
*3 Derate (1.5 mW/°C) above 25°C ambient

■ Recommended Operating Conditions

Item	Symbol	min.	typ.	max.	Unit
Supply Voltage (collector supplying voltage)	V_{CC}		5～24		V
Input Forward Current	I_F		5～20		mA

■ Electro-Optical Characteristics (Ta=25°C)

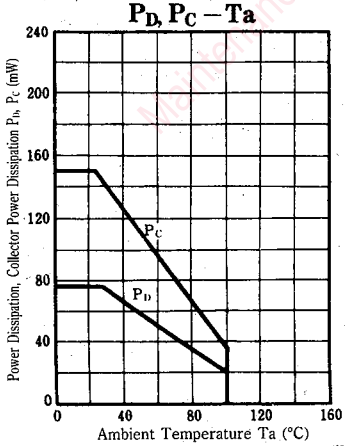
Item		Symbol	Condition	min.	typ.	max.	Unit
Input Characteristics	Reverse Current (DC)	I_R	V_R=3 V			10	μA
	Forward Voltage (DC)	V_F	I_F=50 mA		1.25	1.5	V
	Capacitance between Terminals	C_t	V_R=0, f=1 MHz		30		pF
Output Characteristics	Collector Cutoff Current	I_{CEO}	V_{CE}=20 V		5	100	nA
	Collector to Emitter Voltage	V_{CEO}	I_C=100 μA	35	50		V
	Collector Output Capacitance	C_C	V_{CE}=10 V, f=1 MHz		3		pF
Coupled Characteristics	DC Current Transfer Ratio	CTR*1,4	V_{CE}=10 V, I_F=5 mA	50		600	%
	Input/Output Breakdown	V_{ISO}	t=1 min., RH<60 %	5000			Vrms
	Input/Output Capacity	C_{ISO}	f=1 MHz		0.7		pF
	Input/Output Resistance	R_{ISO}	V_{ISO}=500 V	10^{11}			Ω
	Rise Time	t_r *2	V_{CC}=10 V, I_C=5 mA, R_L=100 Ω		4		μs
	Fall Time	t_f *3			4		μs
	Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	I_F=20 mA, I_C=1 mA		0.1	0.2	V

*2 Rise time (Time required for the collector current to increase from 10% to 90% of its final value)
*3 Fall time (Time required for the collector current to decrease from 90% to 10% of its final value)

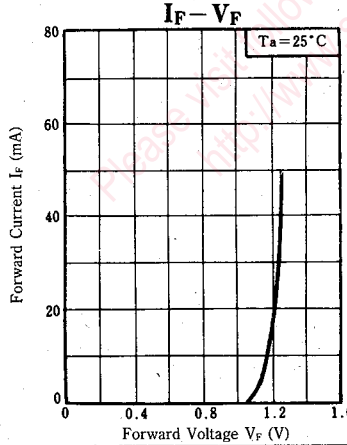
*4 CTR Classification (ON 3161 only)

Class	Q	R	S
CTR(%)	50～120	100～250	200～600

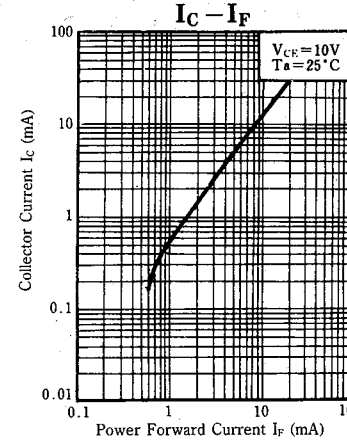
P_D, P_C – Ta



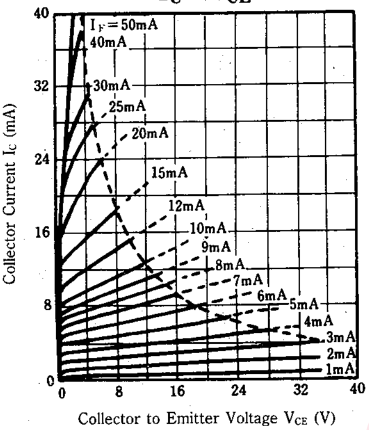
I_F – V_F



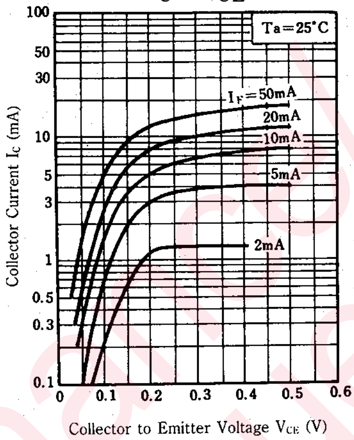
I_C – I_F



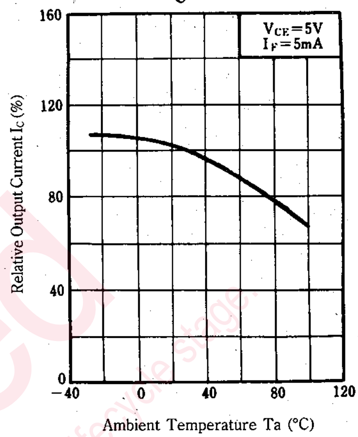
I_C — V_{CE}



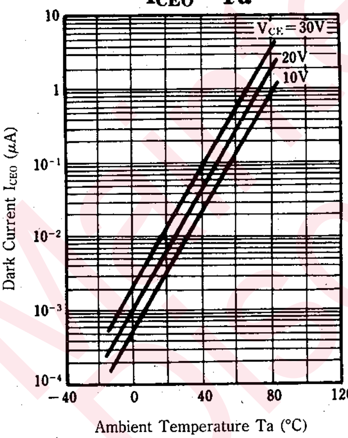
I_C — V_{CE}



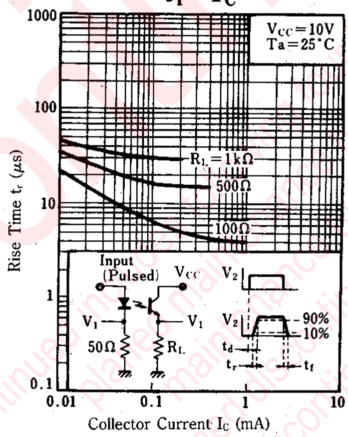
I_C — Ta



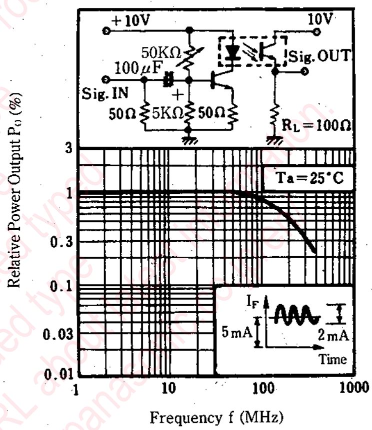
I_{CEO} — Ta



t_r — I_C



Frequency Characteristics



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