MINI MOLD TYPE PHOTO COUPLER

■ GENERAL DESCRIPTION

The NJL5151M series are small package dual-in-line photo couplers, which consist of high power infrared emitting diode and high sensitve Si photo transistor.

UL standards (File No.E82561)

■ FEATURES

- Small package
- High isolation voltage
- Multi channel application
- Compatible for TTL
- UL standards (File No. E82561)

■ APPLICATIONS

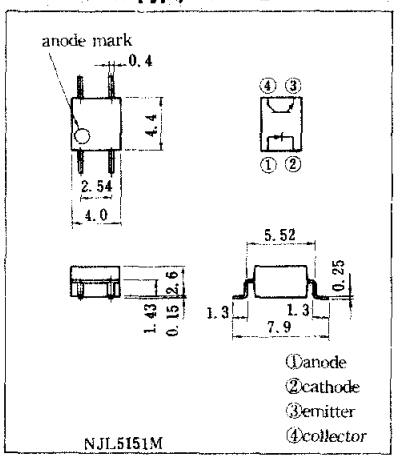
- Interface of computer
- Noise rejection in system circuit
- Signal transfer between the different electric potentials or impedance of circuit
- Copy machine, automatic vending machine
- Telephone set, home appliances

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Emitter			
Forward Current (Continuous)			
NJL5151M	I_F	70	mA
NJL5152M/5153M	I_F	50	mA
Pulse Forward Current	I_{FP}	1(note 1)	A
Reverse Voltage (Continuous)	V_R	6	V
Power Dissipation			
NJL5151M	P_D	100	mW
NJL5152M/5153M	P_D	75(per channel)	mW
Detector			
Collector-Emitter Voltage	V_{CEO}	35	V
Emitter-Collector Voltage	V_{ECO}	6	V
Collector Current	I_C	50	mA
Collector Power Dissipation			
NJL5151M	P_C	150	mW
NJL5152M/5153M	P_C	100(per channel)	mW
Coupled			
Total Power Dissipation			
NJL5151M	P_{tot}	200	mW
NJL5152M/5153M	P_{tot}	150(per channel)	mW
Isolation Voltage	V_{ISO}	4000(note 2)	V
Operating Temperature	T_{opr}	−30～+100	°C
Storage Temperature	T_{stg}	−40～+125	°C

(note 1) Pulse Width≦100μs, Duty Ratio: 0.01
(note 2) R.H.=40 to 60% for AC 1 minute

■ OUTLINE (typ.) Unit: mm



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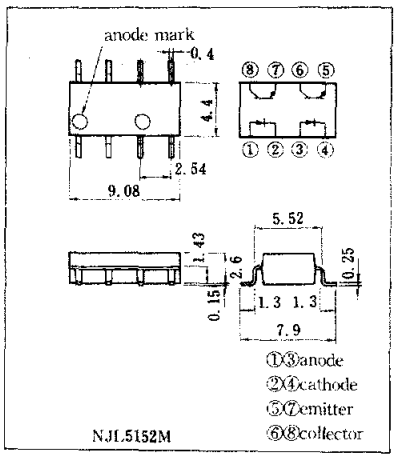

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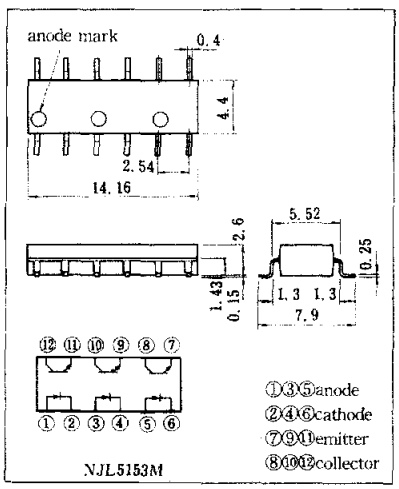


■ ELECTRO-OPTICAL CHARACTERISTICS (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Emitter						
Forward Voltage	V_F	I_F=20mA	—	1.2	1.5	V
Pulse Forward Voltage	V_{FP}	I_{FP}=1A	—	1.8	—	V
Reverse Current	I_R	V_R=6V	—	—	1	μA
Capacitance	Ct	V_R=0V, f=1MHz	—	35	—	pF
Detector						
Dark Current	I_{CEO}	V_{CE}=10V	—	—	100	nA
Collector-Emitter Voltage	V_{CEO}	I_{CE}=100μA	35	—	—	V
Emitter-Collector Current	I_{ECO}	V_{EC}=6V	—	—	100	μA
Coupled						
Isolation Capacitance	Cf	V_R=0V, f=1MHz	—	0.6	—	pF
Collector-Emitter Saturation Voltage	V_{CE}(sat)	I_F=10mA, I_C=1mA	—	0.1	0.3	V
Current Transfer Ratio	CTR	I_F=5mA, V_{CE}=5V	40	—	480	%
Cut-off Frequency	f_C	V^+=5V, I_C=2mA, R_L=100Ω	—	100	—	kHz
Rise Time	t_r	V^+=5V, I_C=2mA, R_L=100Ω	—	2	—	μs
Fall Time	t_f	V^+=5V, I_C=2mA, R_L=100Ω	—	2.5	—	μs
Delay Time	t_d	V^+=5V, I_C=2mA, R_L=100Ω	—	2	—	μs

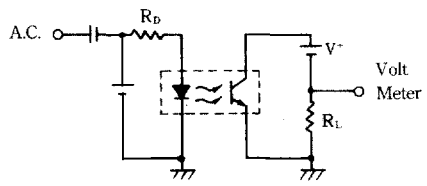
4

■ RANK OF CURRENT TRASFER RATIO (Unit: %)

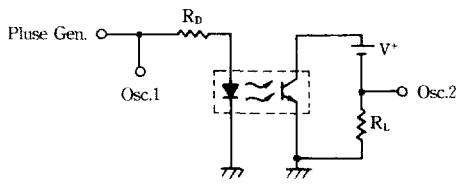
RANK	A	B	C	D	E	F
NJL5151M	160~480	80~240	40~120	80~480	40~240	40~480
NJL5152M/5153M	—	—	—	80~480	40~240	40~480

■ TEST CIRCUIT

Test Circuit for Cut-off Frequency

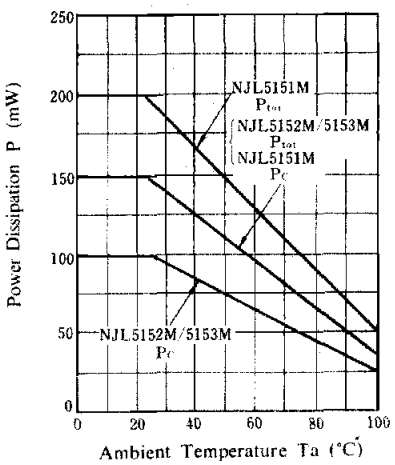


Test Circuit for Switching Time

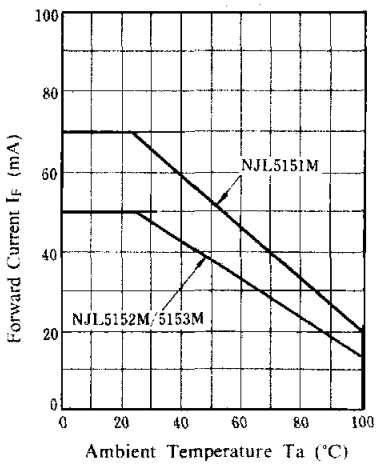


■ MAXIMUM RATING CURVES

Power Dissipation vs. Temperature

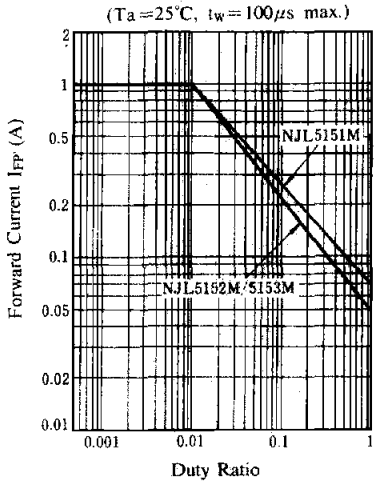


Forward Current vs. Temperature



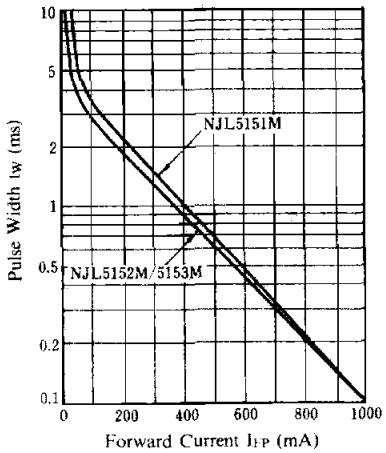
Pulse Forward Current vs. Duty Ratio

(Ta = 25°C, tW = 100μs max.)



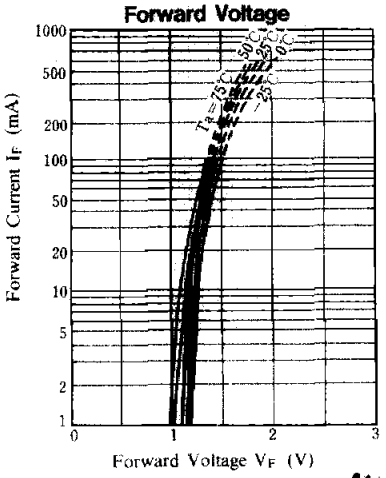
Pulse Width vs. Forward Current

(Ta = 25°C, Duty Ratio 0.01 max.)

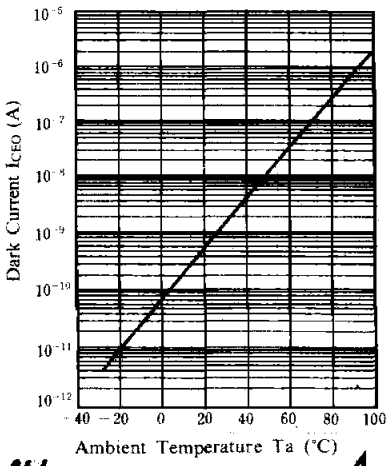


■ TYPICAL CHARACTERISTICS

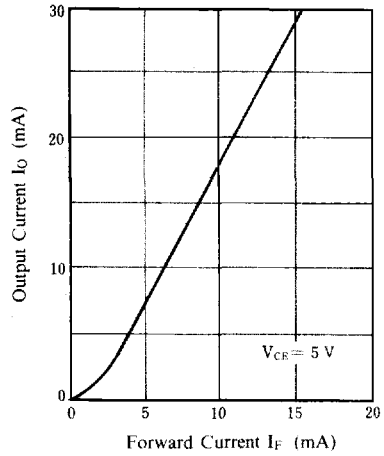
Forward Current vs. Forward Voltage



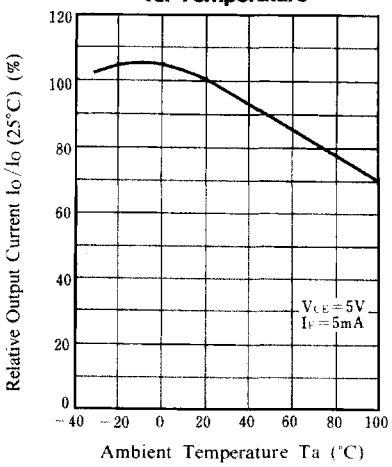
Dark Current vs. Temperature (V_{CE} = 10V)



Output Current vs. Forward Current (Ta=25°C)



Output Current vs. Temperature



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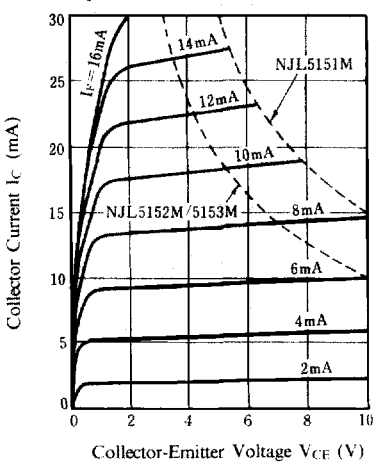
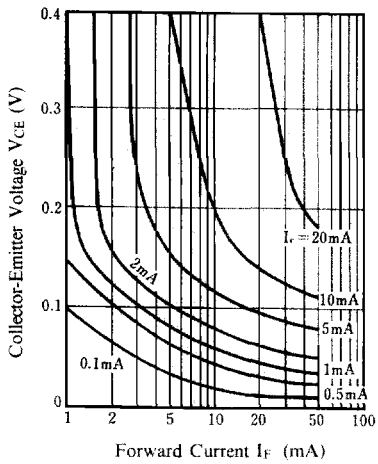
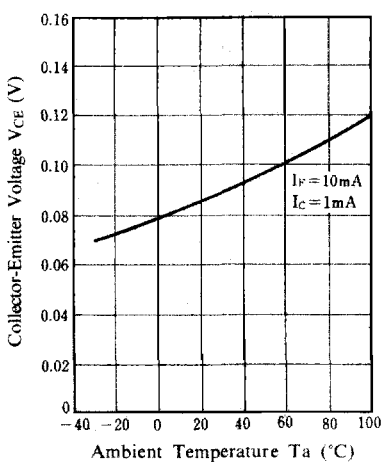
Output Characteristics (Ta=25°C)



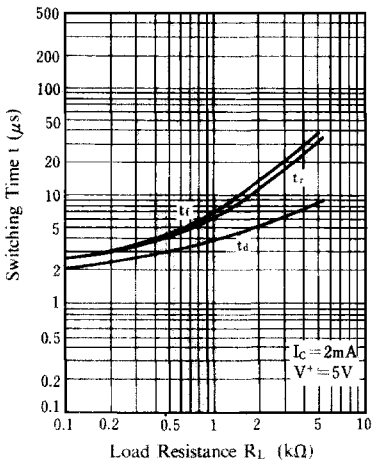
V_{CE} Saturation (Ta=25°C)



V_{CE} Saturation vs. Temperature



Switching Time vs. Load Resistance (Ta=25°C)



Current Transfer Ratio vs. Frequency (Ta=25℃)