

GP1F562T/GP1F553T/GP1FB200TK

Thin Type Optical Mini-jack Transmitter Type for Digital Audio Equipment

■ Features

1. Compact
(adoption of small jack for mini plug JIS C656φ)
2. Thin type (4.4mm) transmitter unit
3. Both optical and electrical signal can be distinguished and transmitted
4. High speed data transmission
Signal transmission speed : MAX. 8Mbps (NRZ signal)
5. Low voltage operation
GP1F562T : 2.7 to 3.6V
GP1F553T : 4.75 to 5.25V
GP1FB200TK : 2.3 to 2.8V
6. Low dissipation current
7. Minimum input optical power level approved by EIAJ stan-dard (CP-1201)

■ Applications

1. MD players
2. Portable CD players

■ Absolute Maximum Ratings (Photoelectric conversion element) (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V _{CC}	-0.5 to +7.0	V
Input voltage	V _{in}	-0.5 to V _{CC} +0.5	V
Operating temperature	GP1F562T/GP1F553T GP1FB200TK	T _{opr}	-20 to +70
			-10 to +70
Storage temperature	T _{stg}	-30 to +80	°C
*1 Soldering temperature	T _{sol}	260	°C

*1 For 5s (2 times or less)

■ Absolute Maximum Ratings(Jack)

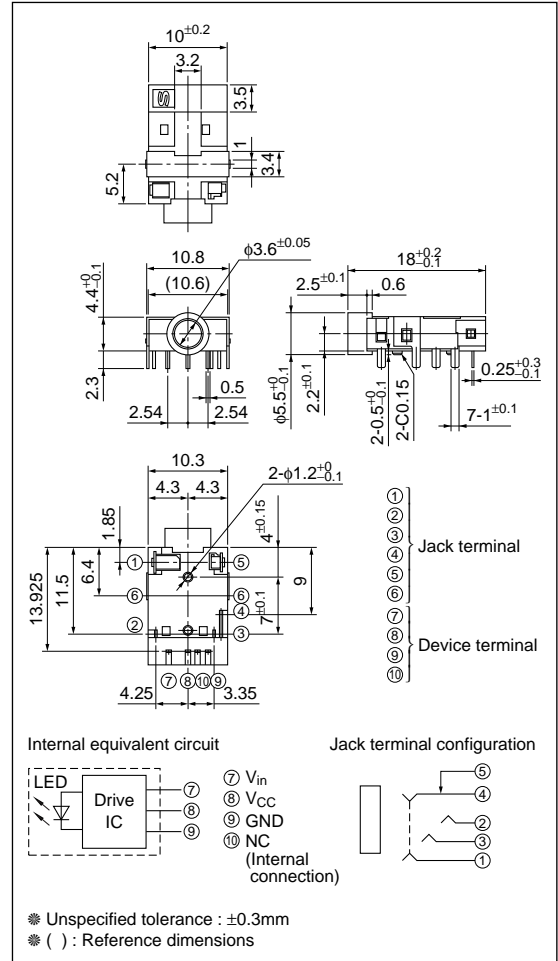
Parameter	Symbol	Rating	Unit
Total power dissipation	P _{tot}	D.C. 12V, 1A	-
Operating temperature	T _{opr}	-20 to +70	°C
Storage temperature	T _{stg}	-30 to +80	°C
*1 Soldering temperature	T _{sol}	260	°C
*2 Isolation voltage	Viso	A.C. 500V rms	-

*1 For 5s (2 times or less)

*2 For 1min

■ Outline Dimensions

(Unit : mm)



■ Recommended Operating Conditions

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating supply voltage	GP1F562T	2.7	3.0	3.6	V
	GP1F553T	4.75	5.0	5.25	
	GP1FB200TK	2.30	2.5	2.8	
Operating transfer rate	T	–	–	8	Mbps

(Ta=25°C
V_{CC}=3.0V (GP1F562T)
V_{CC}=5.0V (GP1F553T)
V_{CC}=2.5V (GP1FB200TK))

■ Electro-optical Characteristics

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Peak emission wavelength	λ_p	—	630	660	690	nm	
Optical power output coupling with fiber	GP1F562T/GP1FB200TK	P _c	Refer to Fig.1	–21	–17	–15	dBm
	GP1F553T			–22			
Dissipation current	GP1F562T	I _{cc}	Refer to Fig.2	–	8	12	mA
	GP1F553T				4	10	
	GP1FB200TK				–	–	
High level dissipation current	GP1F562T/GP1F553T	I _{ccH}	Refer to Fig.2	–	–	–	mA
Low level dissipation current	GP1F562T/GP1F553T	I _{ccL}	Refer to Fig.2	–	–	–	mA
	GP1FB200TK				0.6	1.0	
High level input voltage	GP1F562T	V _{IH}	Refer to Fig.2	2.1	–	–	V
	GP1F553T			2			
	GP1FB200TK			1.9			
Low level input voltage	GP1F562T/GP1F553T	V _{IL}	Refer to Fig.2	–	–	0.8	V
	GP1FB200TK					0.7	
Low → High delay time	GP1F562T/GP1FB200TK	t _{pLH}	Refer to Fig.3	–	–	180	ns
	GP1F553T					100	
High → Low delay time	GP1F562T/GP1FB200TK	t _{pHL}	Refer to Fig.3	–	–	180	ns
	GP1F553T					100	
Pulse width distortion	GP1F562T/GP1FB200TK	Δt_w	Refer to Fig.3	–30	–	+30	ns
	GP1F553T			–25		+25	
Jitter	GP1F562T/GP1FB200TK	Δt_j	Refer to Fig.3	–	1	30	ns
	GP1F553T					25	

■ Mechanical and Electrical Characteristics(Jack)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Insertion force, withdrawal force	F _p	*3	5	–	35	N
Contact resistance	R _{con}	*4	–	–	30	mΩ
Isolation resistance	R _{iso}	D.C. 500V, 1min.	100	–	–	MΩ

Note) This jack is designed for applicable to $\phi 3.5$ compact single head plug (JIS C6560).

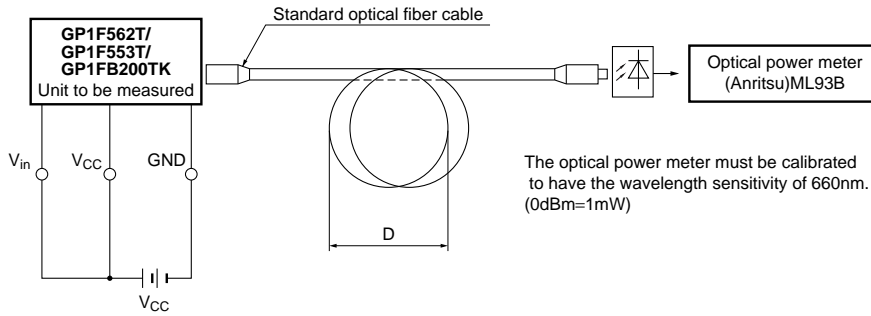
*3 Measuring method of insertion force and withdrawal force.

Insertion and withdrawal force shall be measured after inserting and withdrawing 3 times by using JIS C6560 standard plug for test.

*4 Measuring method of contact resistance.

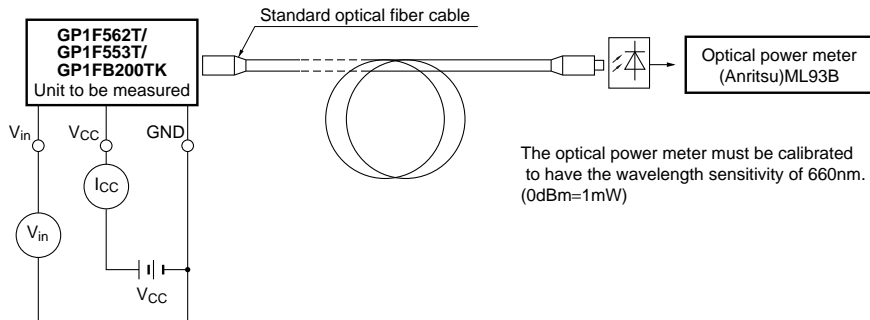
It measures at 100mA or less and 1000Hz at the condition of inserting JIS C6560 standard plug for test in which movable contact terminal and make contacts are described.

Fig.1 Measuring Method of Optical Output Coupling with Fiber



- Notes (1) **GP1F562T** $V_{cc}=3.0\pm 0.05V$ (State of operating)
GP1F553T $V_{cc}=5.0V$ (State of operating)
GP1FB200TK $V_{cc}=2.5V$ (State of operating)
 (2) To bundle up the standard fiber optic cable, make it into a loop with the diameter $D=10\text{cm}$ or more.
 (The standard fiber optic cable will be specified elsewhere.)

Fig.2 Measuring Method of Input Voltage and Supply Current



Input conditions and judgement method (**GP1F562T**)

Conditions	Judgement method
$V_{in}=2.1V$ or more	$-21 \leq P_c \leq -15\text{dBm}$, $I_{cc}=12\text{mA}$ or less
$V_{in}=0.8V$ or less	$P_c \leq -36\text{dBm}$, $I_{cc}=12\text{mA}$ or less

Note) $V_{cc}=3.0\pm 0.05V$ (State of operating)

Input conditions and judgement method (**GP1F553T**)

Conditions	Judgement method
$V_{in}=2.0V$ or more	$-22 \leq P_c \leq 15\text{dBm}$, $I_{cc}=10\text{mA}$ or less
$V_{in}=0.8V$ or less	$P_c \leq -36\text{dBm}$, $I_{cc}=10\text{mA}$ or less

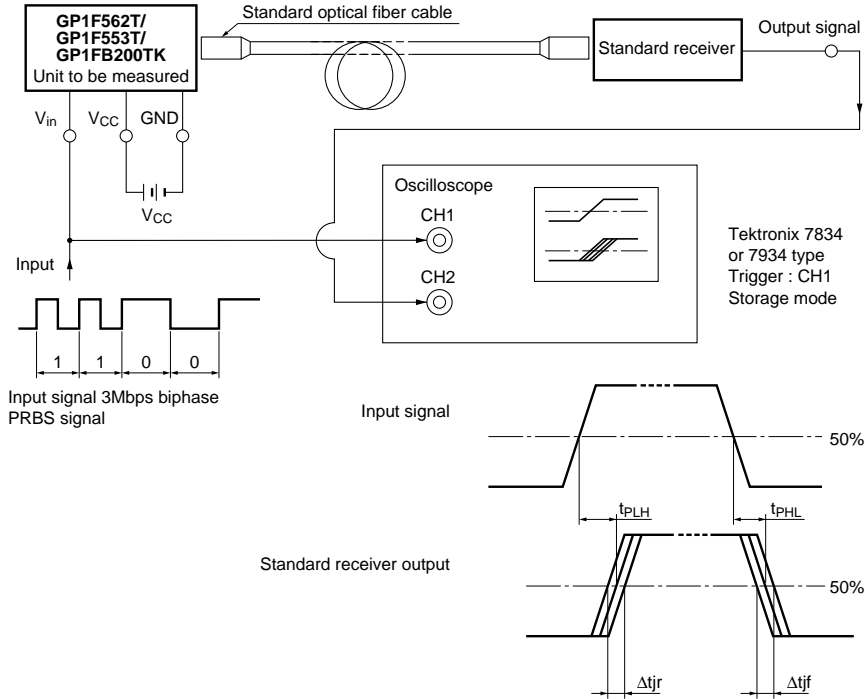
Note) $V_{cc}=5.0$ (State of operating)

Input conditions and judgement method (**GP1FB200TK**)

Conditions	Judgement method
$V_{in}=1.9V$ or more	$-21 \leq P_c \leq -15\text{dBm}$, $I_{cc}=10\text{mA}$ or less
$V_{in}=0.7V$ or less	$P_c \leq -36\text{dBm}$, $I_{cc}=1.0\text{mA}$ or less

Note) $V_{cc}=2.5$ (State of operating)

Fig.3 Measuring Method of Pulse Response and Jitter



Test item

Test item	Symbol	Test condition
Low → High pulse delay time	t_{PLH}	Refer to the above mentioned prescription.
High → Low pulse delay time	t_{PHL}	Refer to the above mentioned prescription.
Pulse width distortion	Δtw	$\Delta tw = t_{PHL} - t_{PLH}$
Low → High Jitter	Δt_{jr}	Set the trigger on the rise of input signal to measure the jitter of the rise of output
High → Low Jitter	Δt_{jf}	Set the trigger on the fall of input signal to measure the jitter of the fall of output

Notes (1) The waveform write time shall be 4 seconds. But do not allow the waveform to be distorted by increasing the brightness too much.

(2) **GP1F562T** $V_{cc} = 3.0 \pm 0.05V$ (State of operating)

GP1F553T $V_{cc} = 5.0V$ (State of operating)

GP1FB200TK $V_{cc} = 2.5V$ (State of operating)

(3) The probe for the oscilloscope must be more than 1M Ω and less than 10pF.

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