

FEATURES

- Ultra high speed operation up to 5 GHz from DC
- Fast rise and fall time less than 80 ps
- High input sensitivity: typ. 150mVp-p at 4 GHz (FMM362HG/HE)
- High phase margin: typ. 200 deg. at 4 GHz (FMM362HG/HE)
- Internal 50Ω input termination resistor for direct series connection
- ECL compatible input and output
- Single-5.2V power supply
- Stable operation at wide temperature range between 0 and 85°C
- Advanced packaging technology for ultra-fast application

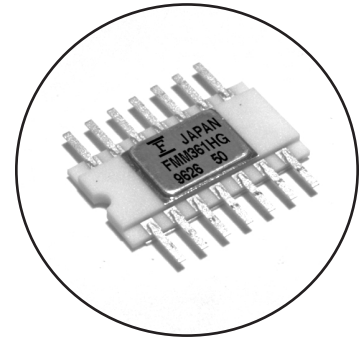
DESCRIPTION

FMM362HG/HE and FMM363HG/HE are ultra high speed GaAs standard logic ICs designed for multi-gigabit optical communication systems and digital test instruments.

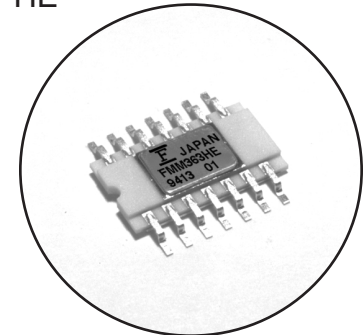
- FMM362HG/HE: Master-slave D-type Flip Flop (D-F/F) : Typ. 5 GHz
- FMM363HG/HE: 2-Input OR/NOR Gate (OR/NOR) : Typ. 5 Gbps

These logic ICs are capable of minimizing output rise and fall time of less than 80 ps. FMM362HG/HE has a high input sensitivity of typ. 150mVp-p and phase margin of typ. 200 deg. at 4 GHz. FMM360 series is provided with internal 50Ω input termination resistor for direct series connection to eliminate the need of additional external biasing network. The GaAs die is attached into advanced 14-pin metal/ceramic flat package designed for ultra high speed application.

HG



HE



FMM362HG/HE, 4Gb/s GaAs **FMM363HG/HE Standard Logic IC**

ABSOLUTE MAXIMUM RATINGS ($V_{DD} = 0V$)

Rating	Symbol	Values	Unit
Supply Voltage	V_{SS}	-7.0 to 0	V
Input Termination Voltage	V_{TI}	-3.0 to 0	V
Output Termination Voltage	V_{TO}	-3.0 to 0	V
Input Voltage	V_{IN}	-2.0 to 0	V
Reference Voltage	V_{REF}	-2.0 to 0	V
Power Dissipation	P_D	1.0	W
Storage Temperature	T_{stg}	-55 to +150	°C

ELECTRICAL CHARACTERISTICS ($T_c = 25^{\circ}C$, $V_{SS} = -5.2V$, $V_{DD} = 0V$)

Parameter	Symbol	FMM362HG/HE (D-F/F)			FMM363HG/HE (OR/NOR)			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Maximum Clock Frequency (Note 1)		4	5	-	4	5	-	Gbps
High Level Input Voltage	V_{IH}	-1.0	-0.9	-	-1.0	-0.9	-	V
Low Level Input Voltage	V_{IL}	-	-1.7	-1.6	-	-1.7	-1.6	V
High Level Output Voltage (Note 2)	V_{OH}	-0.95	-	-	-0.95	-	-	V
Low Level Output Voltage (Note 2)	V_{OL}	-	-	-1.65	-	-	-1.65	V
Output Rise Time (Note 3)	t_f	-	60	80	-	60	80	ps
Output Fall Time (Note 3)	t_f	-	60	80	-	60	80	ps
Power Supply Current	I_{ss}	-	90	-	-	90	-	mA

Note 1: FMM363HG/HE-Maximum Data Rate (Gbit/s) NRZ

Note 2: 50W termination to -2V (V_{TO})

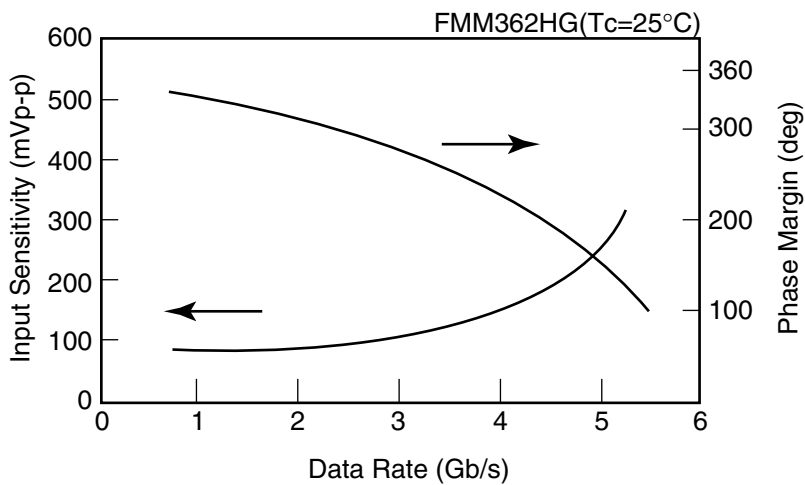
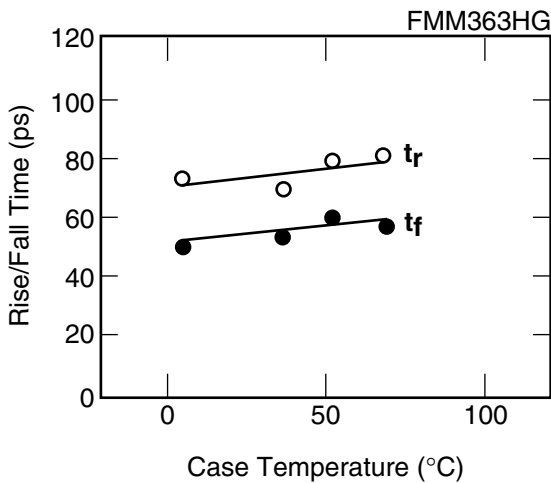
Note 3: 20%~80%

RECOMMENDED OPERATING CONDITIONS ($V_{DD} = 0V$)

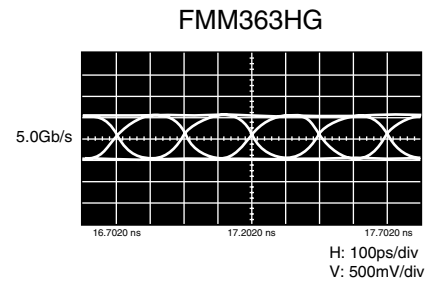
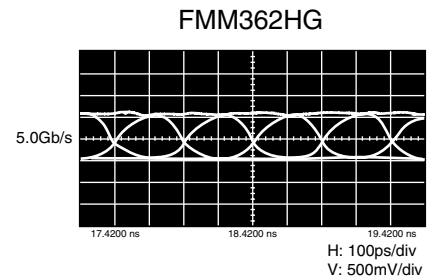
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Supply Voltage	V_{SS}	-5.46	-5.2	-4.94	V
Output Termination Voltage	V_{TO}	-2.1	-2.0	-1.9	V
Reference Voltage	V_{REF}	-1.4	-1.3	-1.2	V
Output Termination Resistor*	R_{TO}	-	50	-	Ω
Operating Case Temperature	T_c	0	-	+65	$^{\circ}C$

* Not required for direct series connection to FMM360 series STD logic.

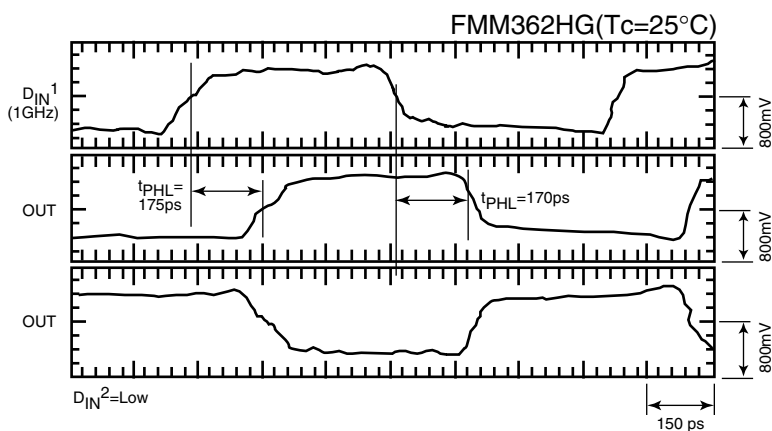
TYPICAL CHARACTERISTICS



OUTPUT WAVEFORMS ($T_c = 25^{\circ}C$)

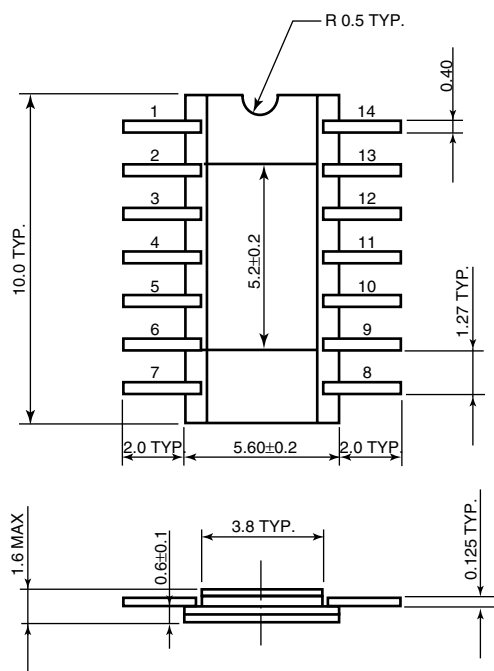


PULSE RESPONSE



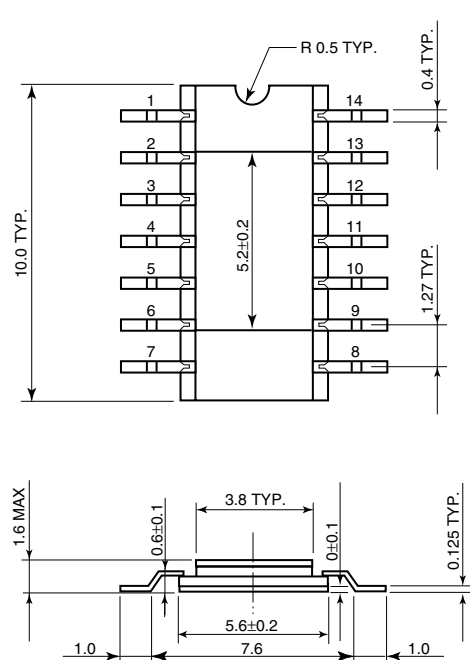
“HG” PACKAGE

UNIT: mm



“HE” PACKAGE

UNIT: mm



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- Do not put this product into the mouth.
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- Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.