GSL304

Ultra Low Power Mobile EMI Reduction IC

Product Description

The GSL304 is a versatile 1x Active EMI management IC designed to provide system wide reduction of Electromagnetic Interference (EMI) and Radio Frequency Interference (RFI) from clock and data sources. The GSL304 allows significant system cost savings by reducing the number of circuit board layers, ferrite beads, shielding and other passive components that are traditionally required to pass EMI regulations.

The GSL304 family of mobile active EMI management ICs is unique in it's design and is based on GS's proprietary "SaΦic" phase controlled Active EMI management technology. This allows operation on aperiodic as well periodic signals. By the precise placement of the edges of the reconstructed input signal, the peak energy of the output is distributed over a wider and controlled energy band thereby significantly lowering system EMI compared to the typical narrow band signal produced by oscillators and most frequency generators.

The GSL304 has an input frequency range of 10MHZ to 50MHz over a wide voltage range of 1.65V to 3.6V. The device can be placed in "power save mode" by setting the PDB pin to GND where in it draws typically 0.1uA and also stes the MODOUT pin to a High-Z state. The device has two "deviation control pins" SS1 and SS0 to allow flexibility and optimization of both EMI compliance as well as in system design.

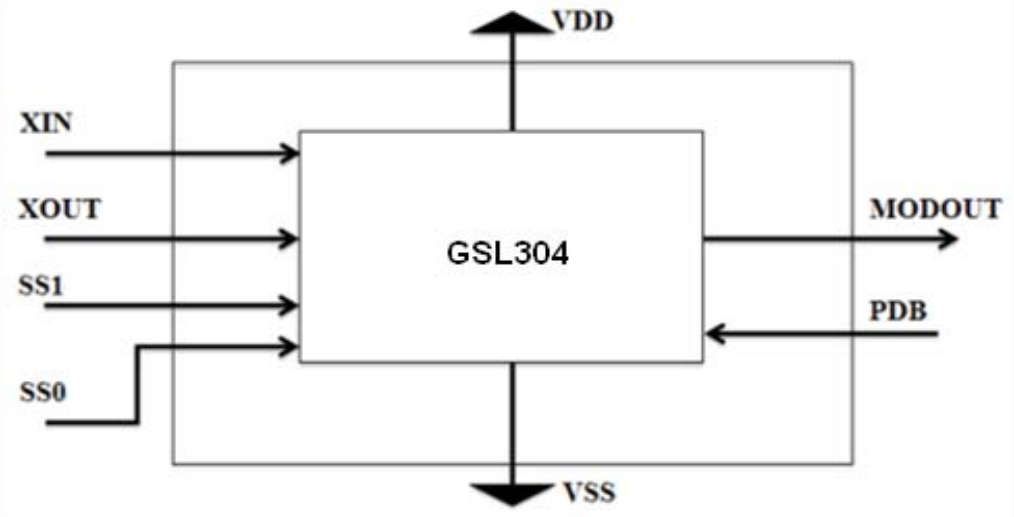
Features

- FCC approved method of EMI attenuation
- Generates a 1X low EMI Phase Modulated replication of the input signal
- Input / Output frequency (Vdd 1.65V-3.6V 10MHz to 50MHz)
- Multiple Deviation Selections
- Power save mode
- Operating Temperature :
  0ºC to 70ºC (Commercial Temp)
  -40ºC to 85ºC (Industrial Temp)
- Available in DFN2x2-8L package
- RoHS Compliant and Halogen Free

Applications

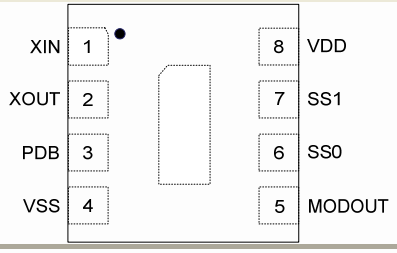
- Mobile applications
- MIDs
- Netbooks
- others where power and space are of key importance

Block Diagram



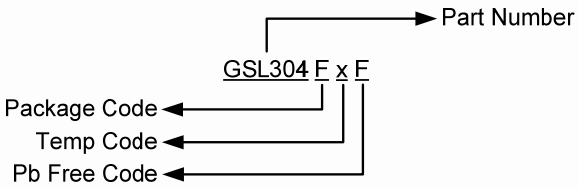
Packages & Pin Assignments

DFN2x2-8L (Top View)



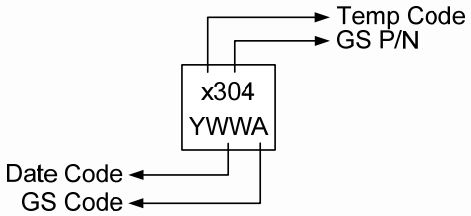
Pin No	Pin Name	Type	Function
1	XIN	I	Crystal Oscillator Input
2	XOUT	O	Crystal Oscillator Output
3	PDB	I	Power Down pin. Active Low. Forces MODOUT to High-Z
4	VSS	P	System ground reference input
5	MODOUT	O	1X phase modulated buffered output
6	SS0	I	Deviation Control Pin (refer Functionality Table) Internal Pull-Up Resistor. Recommend external Pull-Down Resistor 0Ω
7	SS1	I	Deviation Control Pin (refer Functionality Table) Internal Pull-Down Resistor. Recommend external Pull-Up Resistor 0Ω
8	VDD	O	System Power Supply pin

Ordering Information



Part Number	Package	Quantity	Temperature
GSL304FLF	DFN2x2-8L	4000 PCS	0ºC to 70ºC
GSL304FIF	DFN2x2-8L	4000 PCS	-40ºC to 85ºC

Marking Information



Part Number	Package	Temperature	Part Marking
GSL304FLF	DFN2x2-8L	0ºC to 70ºC	L304 YWWA
GSL304FIF	DFN2x2-8L	-40ºC to 85ºC	I304 YWWA

Operating Conditions

Symbol	Parameter	Min	Max	Unit
$V_{DD(3.3V)}$	Supply Voltage	1.65	3.6	V
T_A	Operating Ambient Temperature (Commercial)	0	+70	ºC
T_A	Operating Ambient Temperature (Industrial)	-40	+85	ºC
C_L	Load Capacitance	-	20	pF
C_{IN}	Input Capacitance	-	5	pF

Absolute Maximum Ratings

Symbol	Parameter	Typical	Unit
V_{IN}	Voltage on any pin with respect to ground	-0.5 to +4.6	V
T_{STG}	Storage temperature range	-65 to +125	ºC
T_S	Max. Soldering temperature (10 sec)	260	ºC
T_J	Junction temperature	150	ºC
T_{DV}	Static discharge voltage (As per JEDEC STD22-A114-B)	2	KV

Note : These are stress ratings only and are not implied nor guaranteed for functional use. Exposure to absolute maximum ratings for prolonged periods of time may affect device reliability.

Electrical Characteristics

(3.3V +/-0.3V)

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{DD}	Supply Voltage	-		3.0	3.3	3.6	V
V_{IH}	Input High Voltage	-		0.66*V_{DD}	-	-	V
V_{IL}	Input Low Voltage	-		-	-	0.33*V_{DD}	V
I_{IH}	Input High Current (pins 5 & 6)	V_{IN}=V_{DD}		-	-	10	µA
I_{IL}	Input Low Current (pins 5 & 6)	V_{IN}=0V		-	-	10	µA
V_{OH}	Output High Voltage	I_{OH}=-8mA		0.75*V_{DD}	-	-	V
V_{OL}	Output Low Voltage	I_{OL}=+8mA		-	-	0.25*V_{DD}	V
I_{CC}	Static Supply Current	PDB=VSS		-	0.1	1.0	µA
I_{DD}	Dynamic Supply Current	27MHz	Unloaded	-	5.0	6	mA
			10pF load	-	5.5	7	
Z_O	Output Impedance	-		-	25	-	Ω
INPUT	Input Frequency	-		10	24	50	MHz
MODOUT	Output Frequency	-		10	24	50	
T_d	Duty Cycle=(t_2/t_1)*100 (1,2)	Measured at V_{DD}/2		45	50	55	%
t_3	Output Rise Time (1,2)	Measured between 20% to 80%		0.7	0.9	1.1	nS
t_4	Output Fall Time (1,2)	Measured between 80% to 20%		0.7	0.9	1.1	nS
t_J	Cycle-to-cycle jitter (2)	Unloaded outputs 27MHz		-	+/-250	-	pS

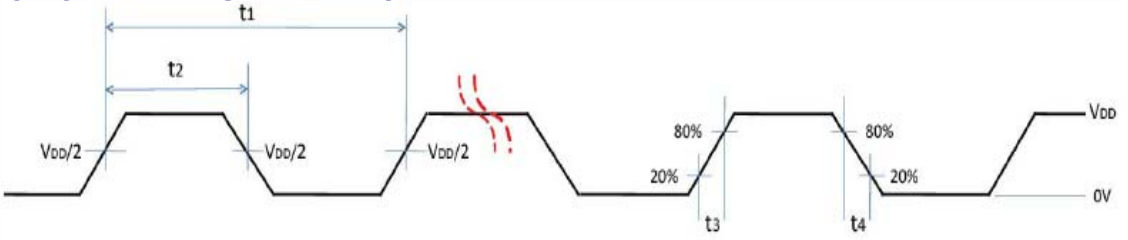
Notes : 1. All parameters specified with loaded outputs.
2. Parameter is guaranteed by design and characterization. Not 100% tested in production.

Functional Table

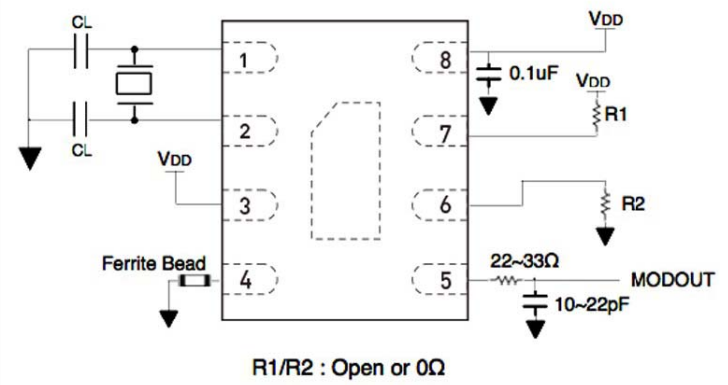
VDD (V)	Freq. Range (MHz)	Freq. (MHz)	Deviation(%)							
			SS1	SS0	SS1	SS0	SS1	SS0	SS1	SS0
			0	0	0	1	1	0	1	1
1.8	10~28	12	±0.09		±0.20		±0.28		±0.35	
1.8		24	±0.13		±0.25		±0.30		-	
1.8		27	±0.14		±0.23		±0.26		-	
1.8	28~33	32	±0.15		-		-		-	
3.3	10~36	12	±0.06		±0.12		±0.18		±0.22	
3.3		24	±0.10		±0.19		±0.26		±0.32	
3.3		27	±0.12		±0.23		±0.31		±0.37	
3.3		32	±0.11		±0.23		±0.29		±0.33	

Note : Frequency deviation can vary over voltage and temperature by 5%.

Duty Cycle Timing & All Outputs Rise/Fall Time

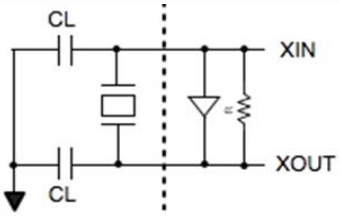


Application Schematic



R1/R2 : Open or 0Ω

Crystal Oscillator Circuit



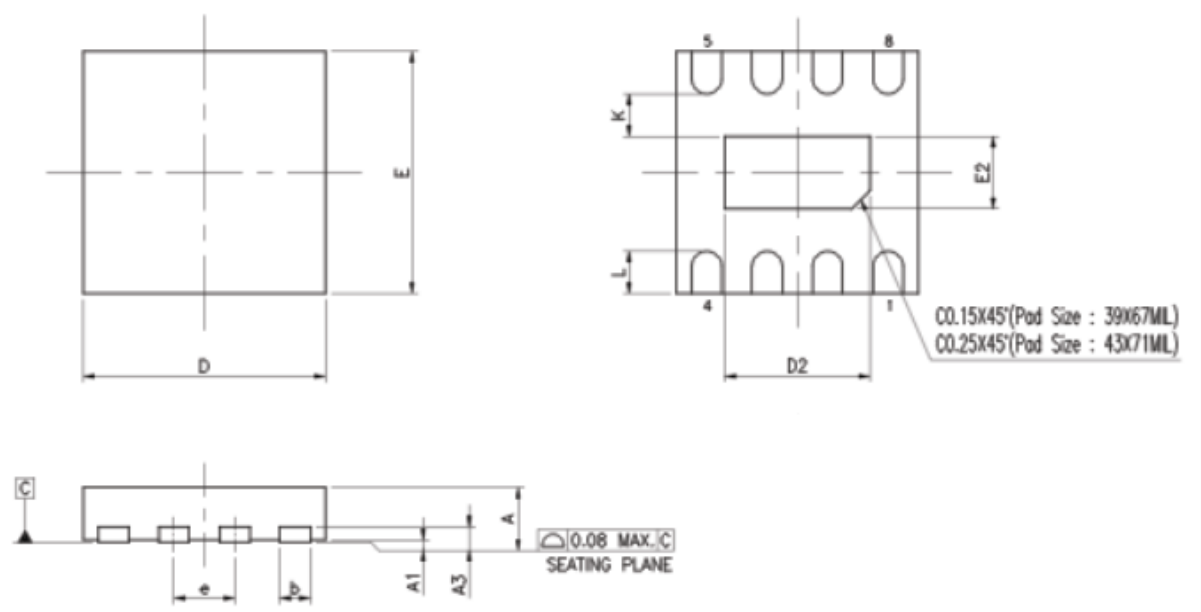
CL=2x(Cp-Cs)

Cp: load capacitance of Crystal

Cs: Stray capacitance (PCB trace + Input cap. of IC)

Package Dimension

DFN2x2-8L



Dimensions						
Symbol	Millimeters			Inches		
	Min	Nom	Max	Min	Nom	Max
A	0.70	0.75	0.80	0.028	0.030	0.032
A1	0.00	0.02	0.05	0.000	0.001	0.002
A3	0.203 (REF)			0.008 (REF)		
b	0.20	0.25	0.30	0.008	0.010	0.012
D	2.00 (BSC)			0.079 (BSC)		
E	2.00 (BSC)			0.079 (BSC)		
e	0.50 (BSC)			0.020 (BSC)		
K	0.20	-	-	0.008	-	-
D2	1.15	1.20	1.25	0.045	0.047	0.049
E2	0.60	0.65	0.70	0.024	0.026	0.028
L	0.20	0.35	0.45	0.008	0.014	0.018

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