RAMBUS™ COMPATIBLE CLOCK GENERATORS S4505/06/07

FEATURES

- Provides two Rambus compatible clock outputs from 240 to 310 MHz
- Uses low cost 14.318 MHz crystal as reference for 250 MHz output
- Low Jitter, <100 ps
- Output skew <50ps
- 45/55% duty cycle
- On-chip filter requires no external components
- Eight-pin, .150" SOIC
- Operates from a single 3.3V ±10% supply
- Series resonant input crystal requires no external components

APPLICATIONS—RDRAM BASED

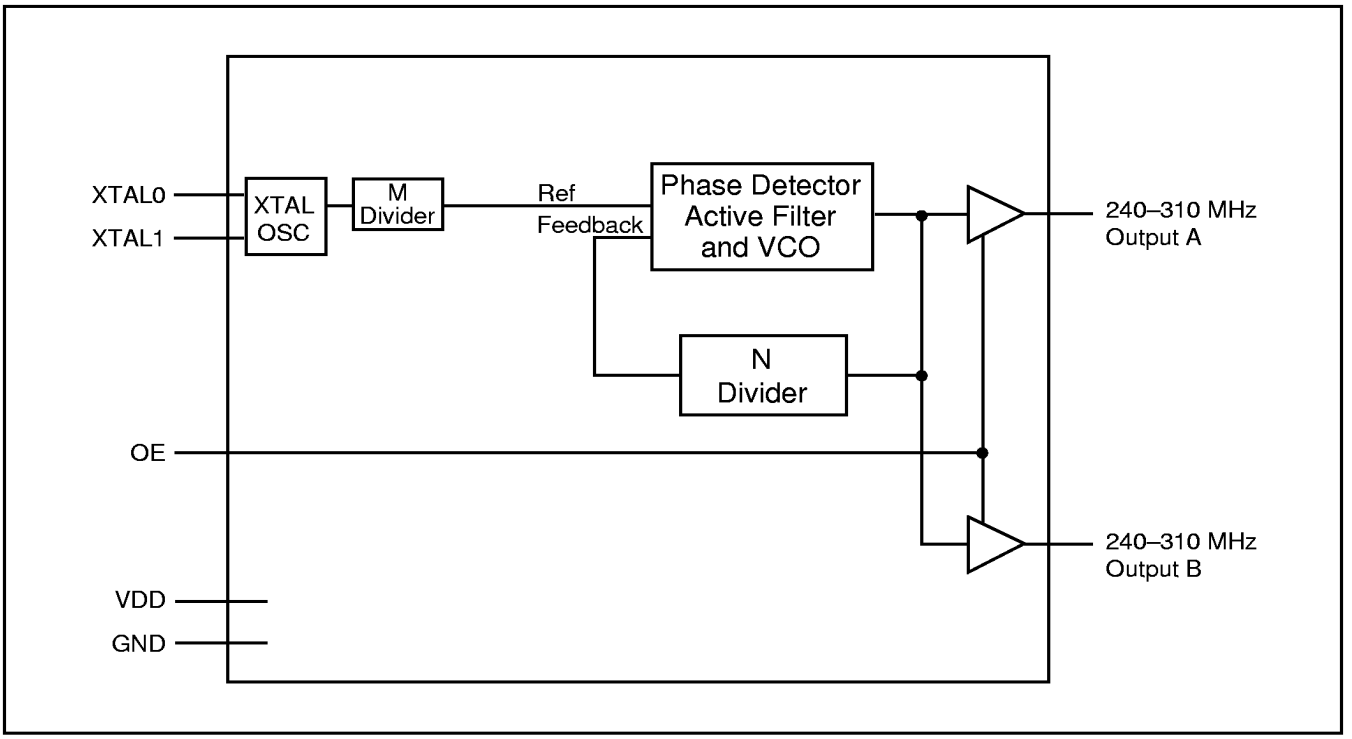
- Graphics Accelerators
- PC Memory
- Set-Top Boxes
- Games

DESCRIPTION

AMCC's advanced PLL technology allows the S4505 to provide two Rambus-compatible, 250, 267, or 300 MHz clocks from a low cost 14.318 MHz crystal. Other reference crystals can be used to produce other output frequencies within the 240–310 MHz range. An external series resistor allows the output to be matched to the Rambus transmission line impedance needed for each application.

AMCC utilizes its high speed, low-jitter PLL technology developed for telecom and precision clocking applications to provide outputs which meet the low jitter and symmetrical duty cycle requirements of RAMBUS system clocks.

Block Diagram



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Absolute Maximum Ratings

Parameter	Description	Value	Unit
V_{DD}	Power supply vs. GND	-0.5 to +5.0	V
V_{IN}	Input voltage, and pin vs. GND	-0.5 to V_{DD} +0.5	V
Storage Temp.	Maximum temperature during storage	170˚	˚C

Note: Stresses greater than the absolute maximum ratings may cause permanent damage to the device. Functional operation of the device at these or any other conditions above those indicated under the normal operating conditions is not guaranteed. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

DC Specifications (T_A = 0˚C – 70˚C, V_{DD} = 3.3 ± 0.3V)

Parameter	Description	Conditions	Min	Max	Unit
V_{IH}	Input HIGH voltage	OE Pin	2.0		V
V_{IL}	Input LOW voltage	OE Pin		0.8	V
I_{IH}	Input HIGH current	OE Pin		50	uA
I_{IL}	Input LOW current	OE Pin – Internal pull-up		300	uA
P_D	Power Dissipation	Dynamic		440	mW

Output Characteristics
All specifications are compatible with Rambus requirements.

Symbol	Description	Comments	Min	Typ	Max	Unit
Z_0	Line impedance	Rambus compatible	25		50	Ω
V_S	Output voltage swing	Rambus compatible	1.2		1.6	V
V_{ACO}	Output Asymmetry	Rambus compatible	-15		+15	%

AC Specifications (Operating Conditions: T_A = 0˚C – 70˚C, V_{DD} = 3.3V ± 0.3V)
All specifications are compatible with Rambus requirements.

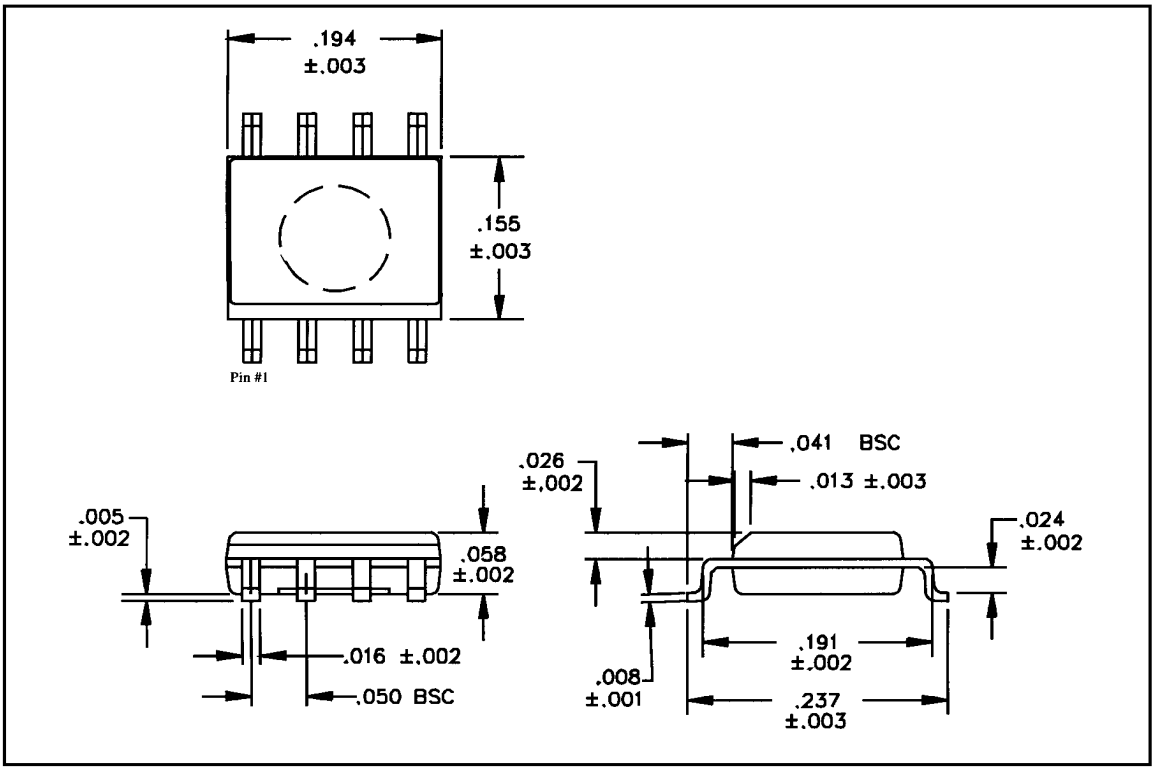
Symbol	Description	Test Condition	Min	Typ	Max	Unit
F_{XTAL}	Crystal frequency		12.86	14.318	14.46	MHz
F_{OUT}	Output frequency,S4505	Typ with 14.318 MHz input[1]	240	267	310	MHz
F_{OUT}	Output frequency,S4506	Typ with 14.318 MHz input[1]	240	250	310	MHz
F_{OUT}	Output frequency,S4507	Typ with 14.318 MHz input[1]	240	300	310	MHz
T_R, T_F	Output clock rise/fall time	20% to 80%	0.2		0.5	ns
T_{DC}	Duty cycle	STD Rambus System Load	45	50	55	%
T_{JPP}	Jitter, peak-to-peak			40	100	ps
T_{PU}	Power-up time	From OFF to clocks stable			10	ms
T_{SKEW}	Output A to B skew	Equal loads		20	50	ps

1. Output frequency multiplier is 35/2 times the input crystal frequency on the S4506, 56/3 times the input crystal frequency on the S4505, and 21 times the input crystal frequency on the S4507.

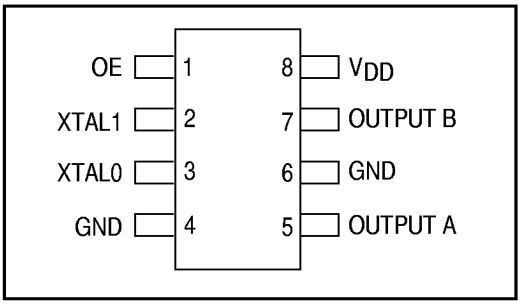
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8-pin SOIC



S4505/06/07 Pinout — 8-Pin SOIC



Pin Descriptions

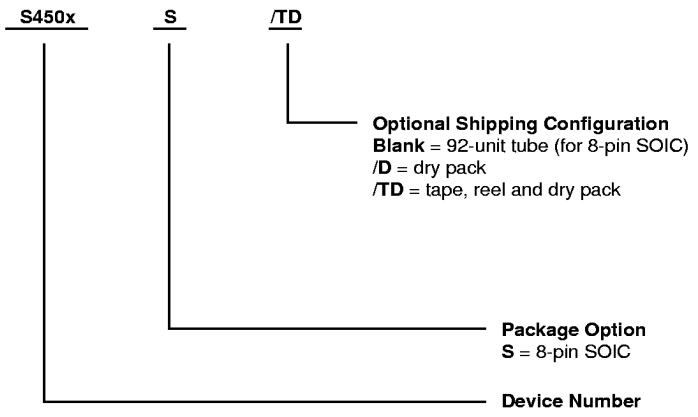
Pin #	Description
1	Output enable, Active HIGH, Internal pull-up
2	Crystal connection — Series Resonant
3	Crystal connection — Series Resonant
4, 6	Ground
5, 7	Output A, B — 240–310 MHz clock outputs, open drain — should be terminated externally to match Rambus specifications
8	Power — 3.3V ± 10%

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Ordering Information

AMCC products are available in several shipping configurations.
The order number is formed by a combination of:

- **Device Number**
- **Package Type**
- **Optional Shipping Configuration**



Example: S4506S/D
8-pin SOIC package, shipped dry packed in tubes.

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