ASM3P2863A

Figure 1. Block Diagram

Table 1. PIN DESCRIPTION (6−Pin TSOT−23 Package)

Pin#	Pin Name	Type	Description
1	REFOUT	O	Buffered output of the input frequency.
2	XOUT	O	Crystal connection. If using an external reference, this pin must be left unconnected.
3	XIN / CLKIN	I	Crystal connection or external reference frequency input. This pin has dual functions. It can be connected either to an external crystal or an external reference clock.
4	VDD	P	Power supply for the entire chip.
5	ModOUT	O	Spread spectrum clock output.
6	VSS	P	Ground connection.

Table 2. PIN DESCRIPTION (8−Pin SOIC and TSSOP Packages)

Pin#	Pin Name	Type	Description
1	XIN / CLKIN	I	Crystal connection or external reference frequency input. This pin has dual functions. It can be connected either to an external crystal or an external reference clock.
2	XOUT	O	Crystal connection. If using an external reference, this pin must be left unconnected.
3	REFOUT	O	Buffered output of the input frequency.
4	NC	–	No connect.
5	VSS	P	Ground connection.
6	ModOUT	O	Spread spectrum clock output.
7	NC	–	No connect.
8	VDD	P	Power supply for the entire chip.

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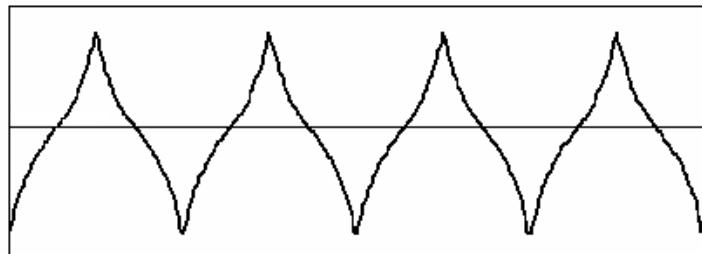
Figure 2. Modulation Profile

Table 3. SPECIFICATIONS

Description	Specification
Input Frequency	12 MHz
Modulation Equation	$F_{IN}/256$
Frequency Deviation	$\pm 0.4\%$ (Typ) @ 12 MHz

Table 4. ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Rating	Unit
VDD, V_{IN}	Voltage on any input pin with respect to Ground	−0.5 to +4.6	V
T_{STG}	Storage temperature	−65 to +125	°C
T_s	Max. Soldering Temperature (10 sec)	260	°C
T_J	Junction Temperature	150	°C
T_{DV}	Static Discharge Voltage (As per JEDEC STD22− A114−B)	2	KV

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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Table 5. DC ELECTRICAL CHARACTERISTICS FOR 2.5 V SUPPLY

(Test condition: All parameters are measured at room temperature (+25°C) unless otherwise stated.)

Symbol	Parameter	Min	Typ	Max	Unit
V_{IL}	Input low voltage	VSS−0.3	–	0.8	V
V_{IH}	Input high voltage	2.0	–	VDD+0.3	V
I_{IL}	Input low current	–	–	−35	μA
I_{IH}	Input high current	–	–	35	μA
I_{XOL}	XOUT output low current (@ 0.5 V, VDD = 2.5 V)	–	3	–	mA
I_{XOH}	XOUT output high current (@ 1.8 V, VDD = 2.5 V)	–	3	–	mA
V_{OL}	Output low voltage (VDD = 2.5 V, I_{OL} = 8 mA)	–	–	0.6	V
V_{OH}	Output high voltage (VDD = 2.5 V, I_{OH} = 8 mA)	1.8	–	–	V
I_{DD}	Static supply current (Note 1)	–	0.8	–	mA
I_{CC}	Dynamic supply current (2.5 V, 12 MHz and no load)	–	3	–	mA
VDD	Operating voltage	2.375	2.5	2.625	V
t_{ON}	Power−up time (first locked cycle after power−up)	–	–	5	mS
Z_{OUT}	Output impedance	–	50	–	Ω

1. XIN / CLKIN pin is pulled low.

Table 6. AC ELECTRICAL CHARACTERISTICS FOR 2.5 V SUPPLY

Symbol	Parameter	Min	Typ	Max	Unit
CLKIN	Input frequency	–	12	–	MHz
ModOUT	Output frequency	–	12	–	MHz
f_d	Frequency Deviation	–	±0.4	–	%
t_{LH} (Note 2)	Output rise time (measured from 0.7 V to 1.7 V)	0.5	1.5	1.7	nS
t_{HL} (Note 2)	Output fall time (measured from 1.7 V to 0.7 V)	0.5	1.0	1.2	nS
t_{JC}	Jitter (Cycle−to−Cycle)	–	200	300	pS
t_D	Output duty cycle	45	50	55	%

2. t_{LH} and t_{HL} are measured into a capacitive load of 15 pF.

Table 7. DC ELECTRICAL CHARACTERISTICS FOR 3.3 V SUPPLY

(Test condition: All parameters are measured at room temperature (+25°C) unless otherwise stated.)

Symbol	Parameter	Min	Typ	Max	Unit
V_{IL}	Input low voltage	VSS−0.3	–	0.8	V
V_{IH}	Input high voltage	2.0	–	VDD+0.3	V
I_{IL}	Input low current	–	–	−35	μA
I_{IH}	Input high current	–	–	35	μA
I_{XOL}	XOUT output low current (@ 0.4 V, V_{DD} = 3.3 V)	–	3	–	mA
I_{XOH}	XOUT output high current (@ 2.5 V, V_{DD} = 3.3 V)	–	3	–	mA
V_{OL}	Output low voltage (VDD = 3.3 V, I_{OL} = 8 mA)	–	–	0.4	V
V_{OH}	Output high voltage (VDD = 3.3 V, I_{OH} = 8 mA)	2.5	–	–	V
I_{DD}	Static supply current (Note 3)	–	1	–	mA
I_{CC}	Dynamic supply current (3.3 V, 12 MHz and no load)	–	3.5	–	mA
VDD	Operating Voltage	3.0	3.3	3.6	V
t_{ON}	Power−up time (first locked cycle after power−up)	–	–	5	mS
Z_{OUT}	Output impedance	–	45	–	Ω

3. XIN / CLKIN pin is pulled low.

Table 8. AC ELECTRICAL CHARACTERISTICS FOR 3.3 V SUPPLY

Symbol	Parameter	Min	Typ	Max	Unit
CLKIN	Input frequency	–	12	–	MHz
ModOUT	Output frequency	–	12	–	MHz
f_d	Frequency Deviation	–	±0.4	–	%
t_{LH} (Note 4)	Output rise time (measured from 0.8 V to 2.0 V)	0.5	1.4	1.6	nS
t_{HL} (Note 4)	Output fall time (measured at 2.0 V to 0.8 V)	0.4	1.0	1.2	nS
t_{JC}	Jitter (Cycle−to−Cycle)	–	200	300	pS
t_D	Output duty cycle	45	50	55	%

4. t_{LH} and t_{HL} are measured into a capacitive load of 15 pF.

Table 9. CRYSTAL SPECIFICATIONS

Fundamental AT Cut Parallel Resonant Crystal	
Nominal frequency	12 MHz
Frequency tolerance	±50 ppm or better at 25°C
Operating temperature range	−25°C to +85°C
Storage temperature	−40°C to +85°C
Load capacitance (C_P)	18 pF
Shunt capacitance	7 pF maximum
ESR	25 Ω

NOTE: C_L is Load Capacitance and Rx is used to prevent oscillations at overtone frequency of the Fundamental frequency.
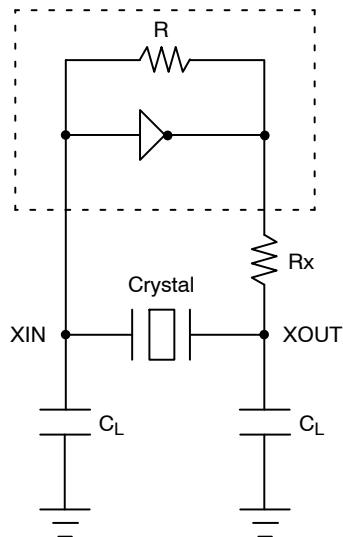
$C_L = 2*(C_P − C_S)$,
Where C_P = Load capacitance of crystal from crystal vendor datasheet.
C_S = Stray capacitance due to C_{IN}, PCB, Trace, etc.

Figure 3. Typical Crystal Interface Circuit

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PACKAGE DIMENSIONS

TSOT−23, 6 LEAD
CASE 419AF−01
ISSUE O

SYMBOL	MIN	NOM	MAX
A			1.00
A1	0.01	0.05	0.10
A2	0.80	0.87	0.90
b	0.30		0.45
c	0.12	0.15	0.20
D		2.90 BSC	
E		2.80 BSC	
E1		1.60 BSC	
e		0.95 TYP	
L	0.30	0.40	0.50
L1		0.60 REF	
L2		0.25 BSC	
θ	0º		8º
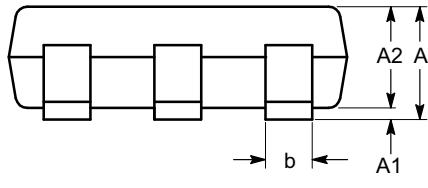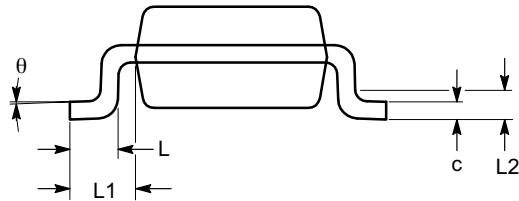
TOP VIEW

SIDE VIEW

END VIEW

Notes:

(1) All dimensions are in millimeters. Angles in degrees.
(2) Complies with JEDEC MO-193.

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PACKAGE DIMENSIONS

SOIC 8, 150 mils
CASE 751BD–01
ISSUE O

PIN # 1
IDENTIFICATION
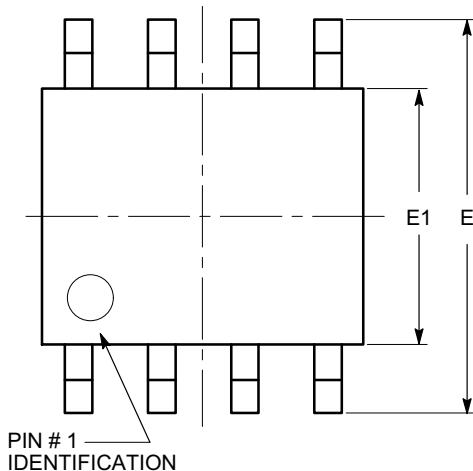
TOP VIEW

SYMBOL	MIN	NOM	MAX
A	1.35		1.75
A1	0.10		0.25
b	0.33		0.51
c	0.19		0.25
D	4.80		5.00
E	5.80		6.20
E1	3.80		4.00
e		1.27 BSC	
h	0.25		0.50
L	0.40		1.27
θ	0º		8º
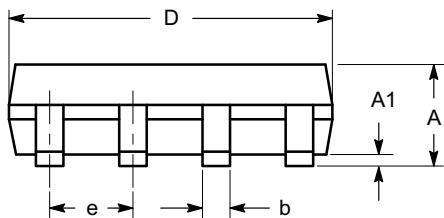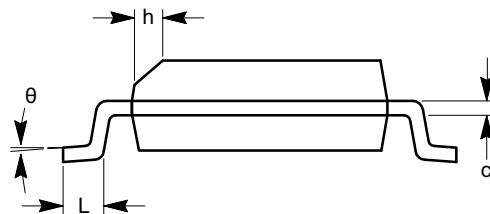
SIDE VIEW

END VIEW

Notes:

(1) All dimensions are in millimeters. Angles in degrees.
(2) Complies with JEDEC MS-012.

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PACKAGE DIMENSIONS

TSSOP8, 4.4x3
CASE 948AL−01
ISSUE O
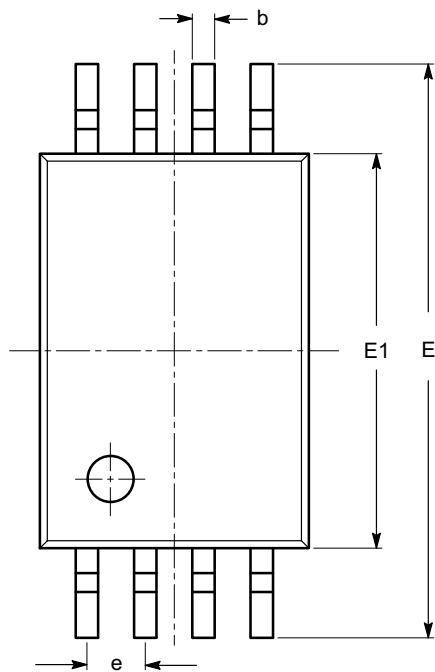
SYMBOL	MIN	NOM	MAX
A			1.20
A1	0.05		0.15
A2	0.80	0.90	1.05
b	0.19		0.30
c	0.09		0.20
D	2.90	3.00	3.10
E	6.30	6.40	6.50
E1	4.30	4.40	4.50
e	0.65 BSC		
L	1.00 REF		
L1	0.50	0.60	0.75
θ	0º		8º
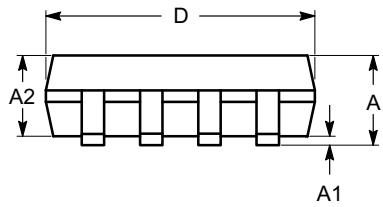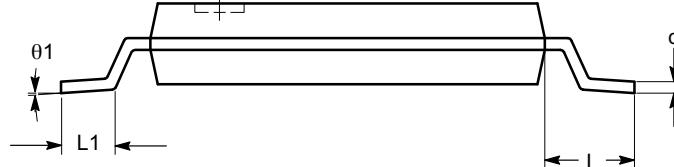
TOP VIEW

SIDE VIEW

END VIEW

Notes:
(1) All dimensions are in millimeters. Angles in degrees.
(2) Complies with JEDEC MO-153.

ASM3P2863A

Table 10. ORDERING INFORMATION

Part Number	Marking	Package Type	Temperature
ASM3P2863AF–06OR	V4LL	6–Pin TSOT–23, TAPE & REEL, Pb Free	Commercial
ASM3P2863AF–08TT	3P2863AF	8–Pin TSSOP, TUBE, Pb Free	Commercial
ASM3P2863AF–08TR	3P2863AF	8–Pin TSSOP, TAPE & REEL, Pb Free	Commercial
ASM3P2863AF–08ST	3P2863AF	8–Pin SOIC, TUBE, Pb Free	Commercial
ASM3P2863AF–08SR	3P2863AF	8–Pin SOIC, TAPE & REEL, Pb Free	Commercial
ASM3P2863AG–06OR	V3LL	6–Pin TSOT–23, TAPE & REEL, Green	Commercial
ASM3P2863AG–08TT	3P2863AG	8–Pin TSSOP, TUBE, Green	Commercial
ASM3P2863AG–08TR	3P2863AG	8–Pin TSSOP, TAPE & REEL, Green	Commercial
ASM3P2863AG–08ST	3P2863AG	8–Pin SOIC, TUBE, Green	Commercial
ASM3P2863AG–08SR	3P2863AG	8–Pin SOIC, TAPE & REEL, Green	Commercial

ASM3P2863A/D