



Ark.h.2G



SMD Differential Output Crystal Oscillators (For Automotive)

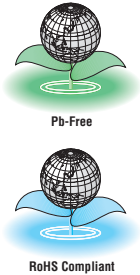
DS2016AK/DS2520AK/DS3225AK, DS2016AKE/DS2520AKE/DS3225AKE,
DS2016AJ/DS2520AJ/DS3225AJ, DS2016AD/DS2520AD/DS3225AD



Actual size DS2016A SERIES □ DS2520A SERIES □
DS3225A SERIES □

Features

- Available frequency: 100MHz, 125MHz, 156.25MHz
- Capable of operating over a wide temperature range from -40 to +125°C
- LV-PECL Output (DS2016AK/DS2520AK/DS3225AK/DS2016AKE/DS2520AKE/DS3225AKE)
- LVDS Output (DS2016AJ/DS2520AJ/DS3225AJ)
- HCSL Output (DS2016AD/DS2520AD/DS3225AD)
- AEC-Q200 Compliant (Option: Equivalent to AEC-Q100)



Applications

- Automotive high-speed communication (Domain ECU, Zone ECU, Ethernet, PCIe)

[Function Code]

DS****AK A A
A: 3.3V
C: 2.5V
D: 1.8V
A: $\pm 100 \times 10^{-6}$
B: $\pm 50 \times 10^{-6}$

When requesting the product, please select the model and function code of your request.

Standard Specification

Item	Type	Symbol	DS2016AK/DS2016AKE DS2520AK/DS2520AKE DS3225AK/DS3225AKE	DS2016AJ DS2520AJ DS3225AJ	DS2016AD DS2520AD DS3225AD
Output Specification	—	—	LV-PECL	LVDS	HCSL
Output Frequency Range	f _o	—	100MHz/125MHz/156.25MHz		
Supply Voltage	V _{cc}	—	+2.5±0.125V/+3.3±0.165V		
Frequency Tolerance	f _{tol}	—	±50×10 ⁻⁶ max., ±100×10 ⁻⁶ max.		
Storage Temperature Range	T _{stg}	—	-40 to +125°C		
Operating Temperature Range	T _{use}	—	-40 to +85°C, -40 to +105°C, -40 to +125°C		
Current Consumption	I _{cc}	—	60mA max.	20mA max.	40mA max.
Stand-by Current (#1pin "L" Level)	I _{std}	—	10μA max.		
Load Condition	Load-R	—	50Ω to V _{cc} -2V	100Ω Output-OutputN	50Ω
Symmetry	SYM	—	45 to 55% [1/2V _{OPP}]		
0 Level Output Voltage	V _{OL}	—	V _{cc} -1.810 to V _{cc} -1.590V	0.90V min.	-0.15 to +0.15V
1 Level Output Voltage	V _{OH}	—	V _{cc} -1.105 to V _{cc} -0.860V	1.60V max.	+0.55 to +0.90V
Rise and Fall Time	tr, tf	—	0.4ns max. [20 to 80% V _{OPP}]	0.25V min.	0.5ns max.(2.5V, 3.3V), 0.6ns max.(1.8V) [20 to 80% V _{OPP}]
Output Voltage	V _{OPP}	—	0.40V min.	0.25V min.	0.55V min
Differential Output Voltage	V _{OD1} , V _{OD2}	—	—	0.247 to 0.454V	—
Change to V _{OD}	ΔV _{OD}	—	—	50mV [ΔV _{OD} = V _{OD1} -V _{OD2}]	—
Offset Voltage	V _{OS}	—	—	1.125 to 1.375V	—
Offset to V _{OS}	ΔV _{OS}	—	—	50mV	—
OE pin 0 Level input Voltage	V _{IL}	—	—	V _{cc} ×0.3max.	—
OE pin 1 Level input Voltage	V _{IH}	—	—	V _{cc} ×0.7min.	—
Output Disable time	t _{PLZ}	—	—	200ns	—
Output Enable time	t _{PZL}	—	—	2ms	—
Phase Jitter [fo offset: 12kHz to 20MHz]	tpj	—	DS2016AK/DS2520AK/DS3225AK 32fs typ., 60fs max. (156.25MHz/V _{cc} =+2.5V, +3.3V) DS2016AKE/DS2520AKE/DS3225AKE 65fs typ., 100fs max. (156.25MHz/V _{cc} =+2.5V, +3.3V)	38fs typ., 60fs max. (156.25MHz/V _{cc} =+2.5V, +3.3V) 45fs typ., 80fs max. (156.25MHz/V _{cc} =+1.8V)	34fs typ., 60fs max. (156.25MHz/V _{cc} =+2.5V, +3.3V) 43fs typ., 80fs max. (156.25MHz/V _{cc} =+1.8V)
Reliability	—	—	AEC-Q100/AEC-Q200		
Packing Unit(1)	—	—	DS2016A SERIES, DS2520A SERIES: 3000pcs./reel (Φ 180), DS3225A SERIES: 2000pcs./reel (Φ 180)		

(1) Moisture prevention packing is unnecessary.

Moisture Sensitivity Level : Level1 (IPC/JEDEC J-STD-033)

Consult our sales representative for other specifications

DS2016A SERIES

[mm]

DS2520A SERIES

[mm]

DS3225A SERIES

[mm]

■ Dimensions

Model Code: DS2016AKSK, DS2016AKSKE, DS2016AJ, DS2016ADSD

Pin Connections:

Pin No.	Connections
#1	OE
#2	NC
#3	GND
#4	Output
#5	OutputN
#6	V _{cc}

Function: #1 Input, #4,5 Output condition: Open or "H" Oscillation out, "L" High Z

Dimensions: 2.0±0.15, 1.6±0.15, 0.7±0.1, 0.95, 0.4, 0.55, 0.45, 0.6, 1.1, 0.8

■ Recommended Land Pattern (Top View)

Dimensions: 0.75, 0.75, 0.95, 0.4, 0.55, 0.45, 0.6, 1.1, 0.8

■ Dimensions

Model Code: DS2520AKSK, DS2520AKSKE, DS2520AJ, DS2520ADSD

Pin Connections:

Pin No.	Connections
#1	OE
#2	NC
#3	GND
#4	Output
#5	OutputN
#6	V _{cc}

Function: #1 Input, #4,5 Output condition: Open or "H" Oscillation out, "L" High Z

Dimensions: 2.5±0.15, 2.0±0.15, 0.85±0.1, 0.938, 1.275, 0.475, 0.46, 0.575, 0.995, 1.375, 0.76, 0.63, 0.975

■ Recommended Land Pattern (Top View)

Dimensions: 0.938, 1.275, 0.475, 0.46, 0.575, 0.995, 1.375, 0.76, 0.63, 0.975

■ Dimensions

Model Code: DS3225AKSK, DS3225AKSKE, DS3225AJ, DS3225ADSD

Pin Connections:

Pin No.	Connections
#1	OE
#2	NC
#3	GND
#4	Output
#5	OutputN
#6	V _{cc}

Function: #1 Input, #4,5 Output condition: Open or "H" Oscillation out, "L" High Z

Dimensions: 3.2±0.15, 2.5±0.15, 1.1±0.1, 1.65, 0.65, 0.65, 1.225, 1.225, 1.800, 0.85, 0.950, 1.000

■ Recommended Land Pattern (Top View)

Dimensions: 1.225, 1.225, 1.800, 0.85, 0.950, 1.000