

MR48V256C

32,768-Word × 8-Bit FeRAM (Ferroelectric Random Access Memory)

GENERAL DESCRIPTION

The MR48V256C is a nonvolatile 32,768-word × 8-bit ferroelectric random access memory (FeRAM) developed in the ferroelectric process and silicon-gate CMOS technology. Unlike SRAMs, this device, whose cells are nonvolatile, eliminates battery backup required to hold data. This device has no mechanisms of erasing and programming memory cells and blocks, such as those used for various EEPROMs. Therefore, the write cycle time can be equal to the read cycle time and the power consumption during a write can be reduced significantly. The MR48V256C can be used in various applications, because the device is guaranteed for the write/read tolerance of 10^{12} cycles per bit and the rewrite count can be extended significantly.

FEATURES

- 32,768-word × 8-bit configuration
- A single 2.7 to 3.6V power supply
- Read access time: 70 ns (Max.)
- Write enable time: 70 ns (Min.)
- Random read/write cycle time 150 ns (Min.)
- Read/write tolerance 10^{12} cycles/bit
- Data retention 10 years
- Guaranteed operating temperature range -40 to 85°C (Extended temperature version)
- Package options:
28-pin plastic TSOPI (TSOP(1)28-08134-0.55-ZK6)

PRODUCT FAMILY

Family	Access Time		Read/Write Cycle Time	Package
	Relative to CE	Relative to OE		
MR48V256C	70ns	40ns	150ns	28pin TSOPI

PIN CONFIGURATION

28-pin plastic TSOPI
P-TSOP(1)28-08134-0.55-ZK6

OE#	1	◎	28	A10
A11	2		27	CE#
A9	3		26	DQ7
A8	4		25	DQ6
A13	5		24	DQ5
WE#	6		23	DQ4
VCC	7		22	DQ3
A14	8		21	VSS
A12	9		20	DQ2
A7	10		19	DQ1
A6	11		18	DQ0
A5	12		17	A0
A4	13		16	A1
A3	14		15	A2

MR48V256C

Note:

Signal names that end with # indicate that the pins are negative-true logic.

PIN DESCRIPTIONS

Pin Name	Description
CE#	Chip enable (input, negative logic) Latches an address by low input, activates the FeRAM, and enables a read or write operation.
OE#	Output enable (input, negative logic) The FeRAM is in read mode when the FeRAM is active and this pin is low, and data is output after the specified time.
WE#	Write enable (input, negative logic) The FeRAM is in write mode when the FeRAM is active and this pin is low, and data is capture at the timing of WE#"H" or CE#"H", whichever is earlier.
A14 to A0	Address (input) The FeRAM captures an address at the timing when CE#"L" is established.
DQ7 to DQ0	3-state data bus (input/output) Outputs data in the read mode, and captures data in the write mode.
V _{CC} , V _{SS}	Power supply Apply the specified voltage to V _{CC} . Connect V _{SS} to ground.

TRUTH TABLE

Operating Mode	CE#	WE#	OE#
Standby Mode	H	X	X
	X	H	H
Address Latched	↓	H	L
	↓	L	H
	L	↓	H
	L	H	↓
Read Mode	L	H	L
Write Mode	L	L	H

Note:

Having WE# and OE# "L" at the same time is forbidden.

DC Characteristics

(Under recommended operating conditions)

Parameter	Symbol	Condition	Min.	Max.	Unit	Note
Output High Voltage	V_{OH}	$I_{OH} = -2 \text{ mA}$	$V_{CC} \times 0.85$	—	V	
Output Low Voltage	V_{OL}	$I_{OL} = 2 \text{ mA}$	—	$V_{CC} \times 0.15$	V	
Input Leakage Current	I_{LI}	—	-10	10	μA	
Output Leakage Current	I_{LO}	—	-10	10	μA	
Power Supply Current (Standby)	I_{CCS}	$V_{IN} = 0.2\text{V}$ or $V_{CC} - 0.2\text{V}$, $CE\# = V_{CC} - 0.2\text{V}$ $I_{OUT} = 0 \text{ mA}$	—	400	μA	
Power Supply Current (Operating)	I_{CCA}	Read Cycle, $t_{RC} = \text{Min.}$ $V_{IN} = 0.2\text{V}$ or $V_{CC} - 0.2\text{V}$, $CE\# = 0.2\text{V}$, $I_{OUT} = 0 \text{ mA}$	—	10	mA	1

Note:

1. Average current. Address change must be one time or less during time t_{RC} .

Read/Write Cycles and Data Retention

(Under recommended operating conditions)

Parameter	Min.	Max.	Unit	Note
Read/Write Cycle	10^{12}	—	Cycle	1
Data Retention	10	—	Year	

Notes:

1. This is applicable to the read cycle, write cycle, and CE-only cycle counts.
This is the cycle count per bit (for one address).

AC Characteristics (Read Cycle)

(Under recommended operating conditions)

Parameter	Symbol	-70		Unit	Note
		Min.	Max.		
Address Set-up Time	t _{AVEL}	0	—	ns	
Address Hold Time (CE#)	t _{ELAX}	10	—	ns	
CE# High Pulse Width	t _{EHEL}	80	—	ns	
Output Hold Time (CE#)	t _{EHQX}	5	—	ns	
Output High Impedance Time (CE#)	t _{EHQZ}	—	25	ns	
CE# Active Time	t _{ELEH}	70	2000	ns	
Read Cycle Time (CE# cycle Time)	t _{ELEL}	150	—	ns	
CE# Access Time	t _{ELQV}	—	70	ns	1
Output Low Impedance Time (CE#)	t _{EHQX}	5	—	ns	
Output Hold Time (OE#)	t _{GHQX}	5	—	ns	
Output High Impedance Time (OE#)	t _{GHQZ}	—	25	ns	
OE# Access Time	t _{GLQV}	—	70	ns	1
Output Low Impedance Time (OE#)	t _{GLQX}	5	—	ns	

Notes:

1. The read data is output at the point where all of the maximum values of t_{ELQV} and t_{GLQV} are satisfied.

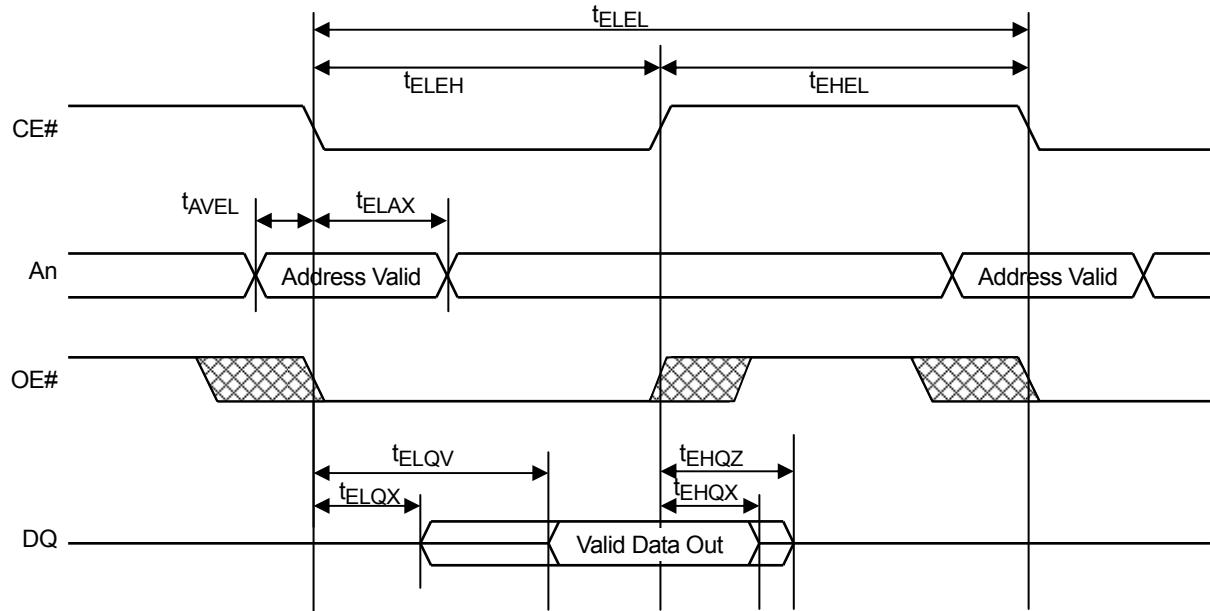
AC Characteristics (Write Cycle)

(Under recommended operating conditions) Note 1

Parameter	Symbol	-70		Unit	Note
		Min.	Max.		
Address Set-up Time	t_{AVEL}	0	—	ns	
Data Set-up Time (WE#)	t_{DVWH}	40	—	ns	
Data Set-up Time (CE#)	t_{DVEH}	40	—	ns	
Address Hold Time (CE#)	t_{ELAX}	10	—	ns	
Data Hold Time (CE#)	t_{EHDX}	0	—	ns	
CE# High Pulse Width	t_{EHEL}	80	—	ns	
CE# Active Time	t_{ELEH}	70	2000	ns	
Write Cycle Time (CE# Cycle Time)	t_{ELEL}	150	—	ns	
Data Hold Time (WE#)	t_{WHDX}	0	—	ns	

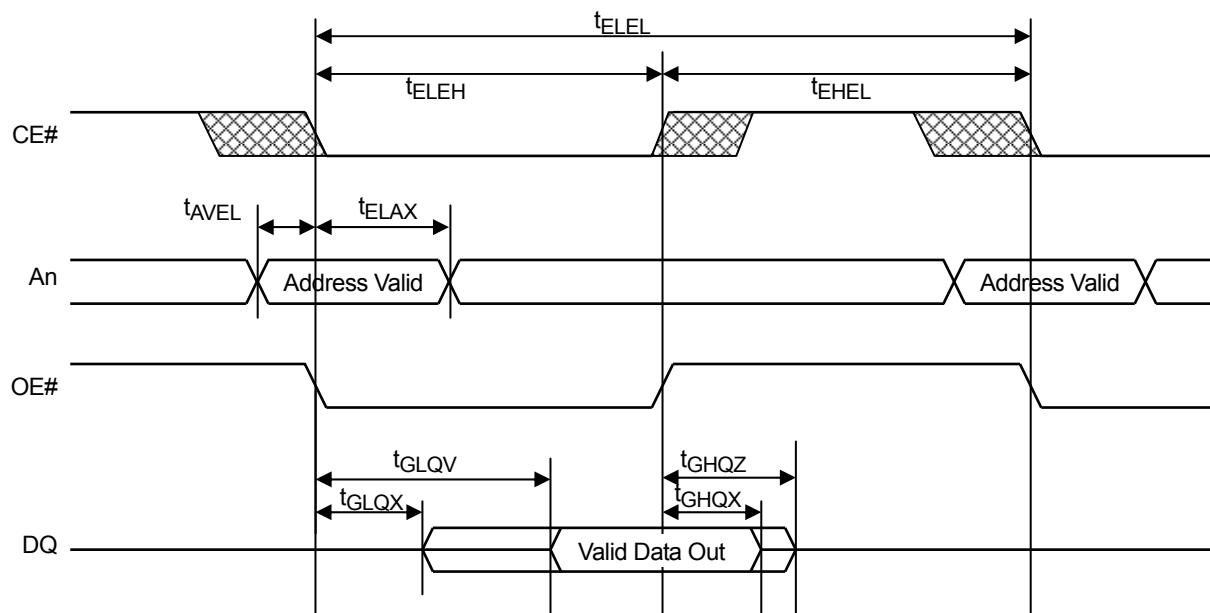
Timing Diagrams

- Read cycle, CE# Control Read



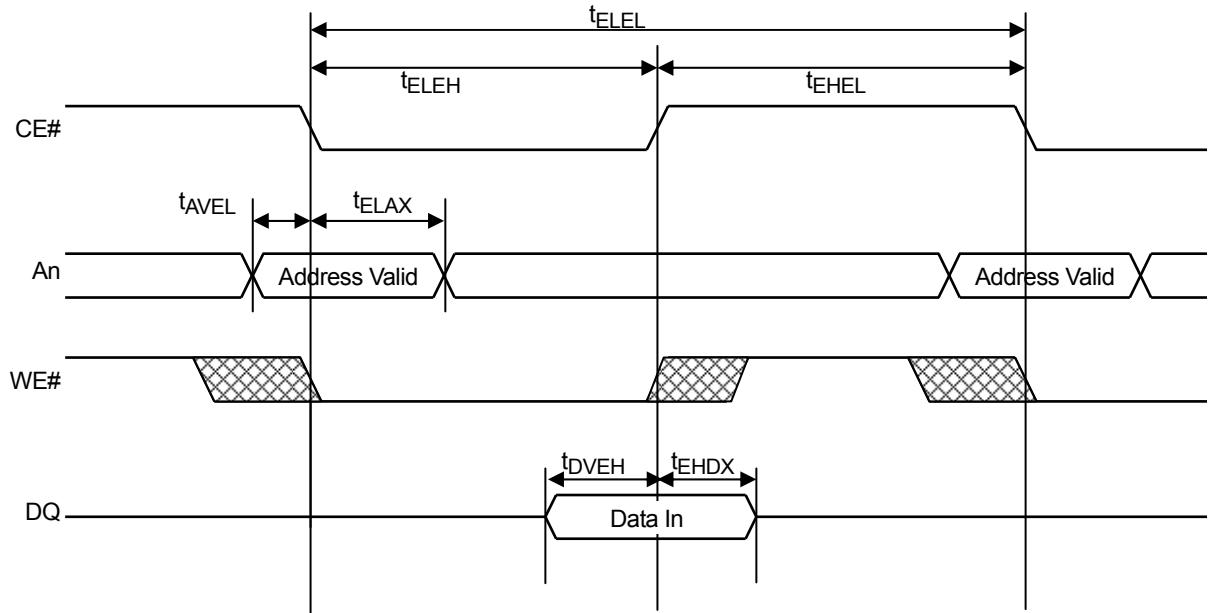
Note: WE# = "H"

- Read cycle, OE# Control Read



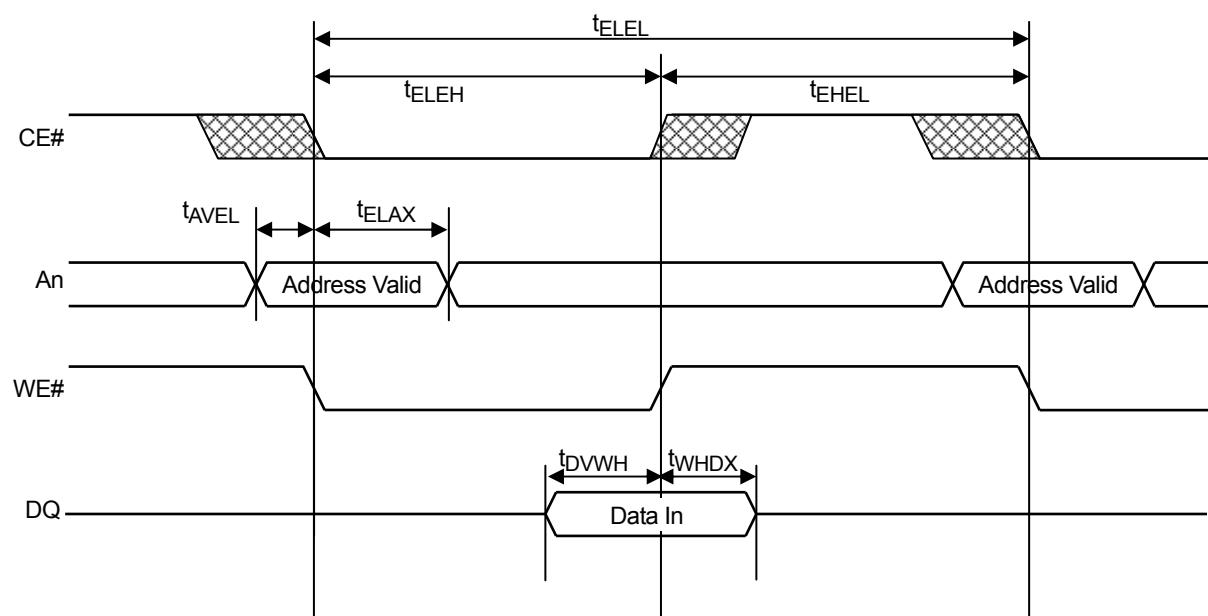
Note: WE# = "H"

•Write cycle, CE# Control Write



Note: OE# = "H"

•Write cycle, WE# Control Write



注記: OE#="H"

•Power-On and Power-Off Characteristics

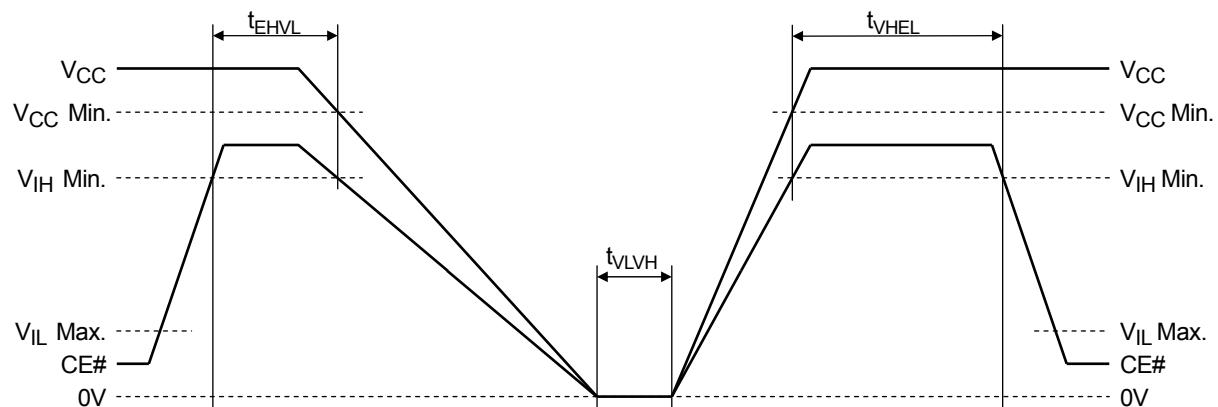
(Under recommended operating conditions)

Parameter	Symbol	Min.	Max.	Unit	Note
Power-On CE# High Hold Time	t_{VHEL}	50	—	μs	1, 2
Power-Off CE# High Hold Time	t_{EHVL}	100	—	ns	1
Power-On Interval Time	t_{VLVH}	1	—	μs	2

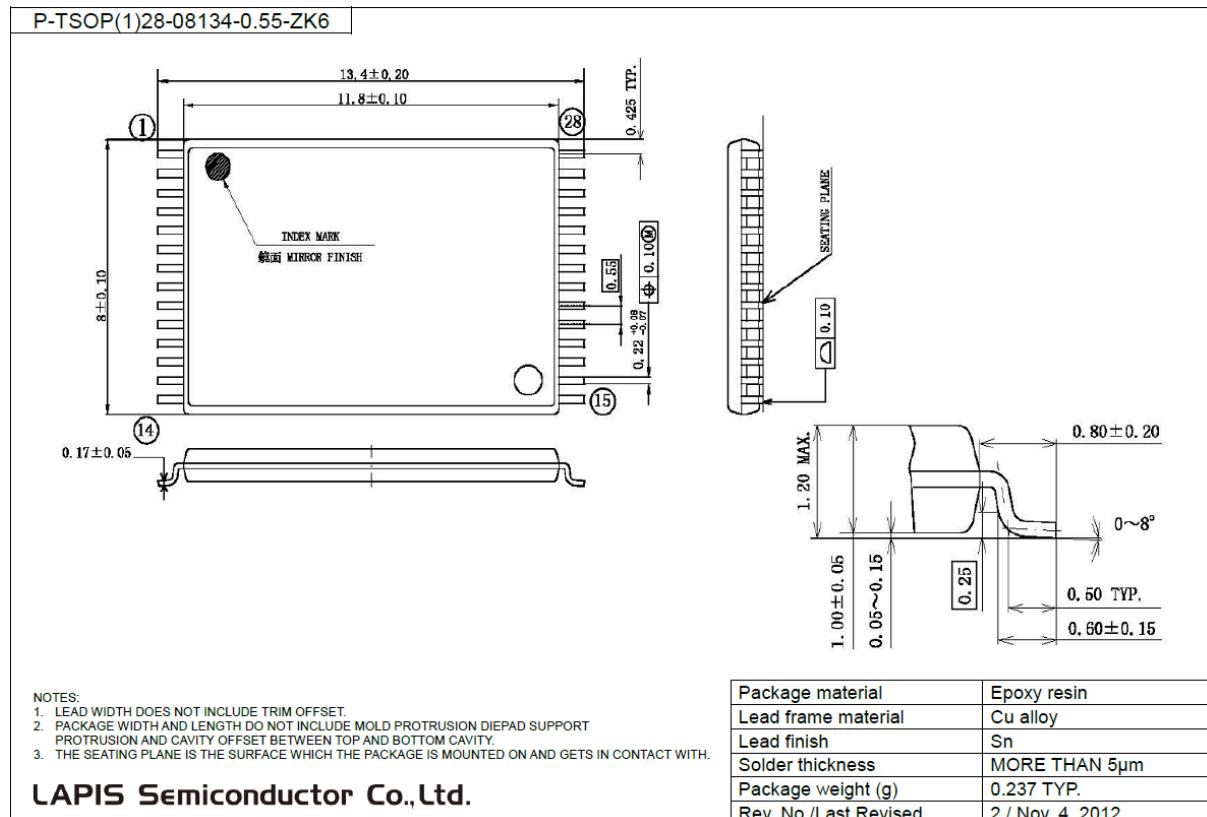
Notes:

1. To prevent an erroneous operation, be sure to maintain $CE\# = "H"$, and set the FeRAM in an inactive state (standby mode) before and after power-on and power-off.
2. Powering on at the intermediate voltage level will cause an erroneous operation; thus, be sure to power up from 0 V.
3. Enter all signals at the same time as power-on or enter all signals after power-on.

•Power-On and Power-Off Sequences



PACKAGE DIMENSIONS



Notes for Mounting the Surface Mount Type Package

The surface mount type packages are very susceptible to heat in reflow mounting and humidity absorbed in storage. Therefore, before you perform reflow mounting, contact ROHM's responsible sales person for the product name, package name, pin number, package code and desired mounting conditions (reflow method, temperature and times).

REVISION HISTORY

Document No.	Date	Page		Description
		Previous Edition	Current Edition	
FEDR48V256C-01	Nov. 13, 2013	–	–	Final Edition 1

NOTES

No copying or reproduction of this document, in part or in whole, is permitted without the consent of LAPI Semiconductor Co., Ltd.

The content specified herein is subject to change for improvement without notice.

The content specified herein is for the purpose of introducing LAPI Semiconductor's products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from LAPI Semiconductor upon request.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, LAPI Semiconductor shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. LAPI Semiconductor does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by LAPI Semiconductor and other parties. LAPI Semiconductor shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products specified in this document are not designed to be radiation tolerant.

While LAPI Semiconductor always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. LAPI Semiconductor shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). LAPI Semiconductor shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing. If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.

Copyright 2013 LAPI Semiconductor Co., Ltd.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[ROHM Semiconductor:](#)

[MR48V256CTAZAARL](#)



OCEAN CHIPS

Океан Электроники

Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибутором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибутором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А