

μPA2822T1L

R07DS0754EJ0100

Rev.1.00

MOS FIELD EFFECT TRANSISTOR

May 25, 2012

Description

The μPA2822T1L is N-channel MOS Field Effect Transistor designed for power management applications of a notebook computer and Lithium-Ion battery protection circuit.

Features

- $V_{DSS} = 30\text{ V}$ ($T_A = 25^\circ\text{C}$)
- Low on-state resistance
— $R_{DS(on)} = 2.6\text{ m}\Omega\text{ MAX.}$ ($V_{GS} = 10\text{ V}$, $I_D = 34\text{ A}$)
- 4.5V Gate-drive available
- Small surface mount package (8-pin HVSON (3333))
- Pb-free, Halogen Free

Ordering Information

Part No.	Lead Plating	Packing	Package
μPA2822T1L-E1-AT *1	Pure Sn (Tin)	Tape 3000 p/reel	8-pin HVSON (3333) typ. 0.028 g
μPA2822T1L-E2-AT *1			

Note: *1. Pb-free (This product does not contain Pb in external electrode and other parts.)

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit
Drain to Source Voltage ($V_{GS} = 0\text{ V}$)	V_{DSS}	30	V
Gate to Source Voltage ($V_{DS} = 0\text{ V}$)	V_{GSS}	±20	V
Drain Current (DC) ($T_C = 25^\circ\text{C}$)	$I_{D(DC)}$	±34	A
Drain Current (pulse) *1	$I_{D(pulse)}$	±150	A
Total Power Dissipation *2	P_{T1}	1.5	W
Total Power Dissipation (PW = 10 sec) *2	P_{T2}	3.8	W
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_{T3}	52	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C
Single Avalanche Current *3	I_{AS}	25	A
Single Avalanche Energy *3	E_{AS}	62.5	mJ

Thermal Resistance

Channel to Ambient Thermal Resistance *2	$R_{th(ch-A)}$	83.3	°C/W
Channel to Case (Drain) Thermal Resistance	$R_{th(ch-C)}$	2.4	°C/W

Notes: *1. $PW \leq 10\ \mu\text{s}$, Duty Cycle $\leq 1\%$

*2. Mounted on a glass epoxy board of 25.4 mm x 25.4 mm x 0.8 mm

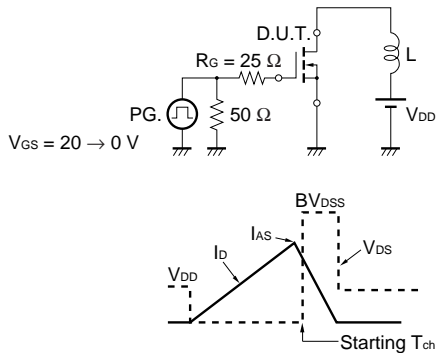
*3. Starting $T_{ch} = 25^\circ\text{C}$, $V_{DD} = 15\text{ V}$, $R_G = 25\ \Omega$, $V_{GS} = 20 \rightarrow 0\text{ V}$, $L = 100\ \mu\text{H}$

Electrical Characteristics (T_A = 25°C)

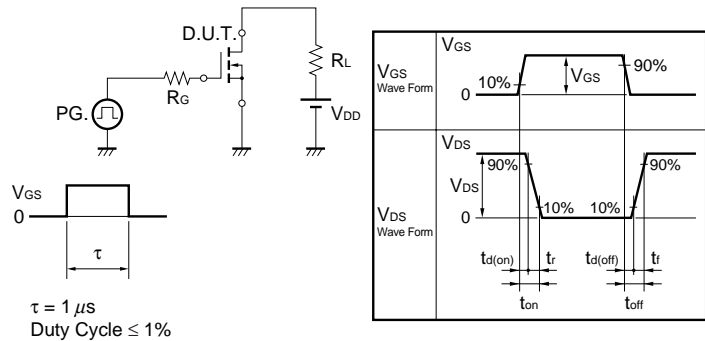
Item	Symbol	MIN.	TYP.	MAX.	Unit	Test Conditions
Zero Gate Voltage Drain Current	I _{DSS}			1	μA	V _{DS} = 30 V, V _{GS} = 0 V
Gate Leakage Current	I _{GSS}			±10	μA	V _{GS} = ±20 V, V _{DS} = 0 V
Gate Cut-off Voltage	V _{GS(off)}	1.0		2.5	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance *1	y _{fs}	16			S	V _{DS} = 5 V, I _D = 8.5 A
Drain to Source On-state Resistance *1	R _{DS(on)1}		1.9	2.6	mΩ	V _{GS} = 10 V, I _D = 34 A
	R _{DS(on)2}		3.5	7.5	mΩ	V _{GS} = 4.5 V, I _D = 8.5 A
Input Capacitance	C _{iss}		4660		pF	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz
Output Capacitance	C _{oss}		1350		pF	
Reverse Transfer Capacitance	C _{rss}		1170		pF	
Turn-on Delay Time	t _{d(on)}		42		ns	V _{DD} = 15 V, I _D = 17 A, V _{GS} = 10 V, R _G = 10 Ω
Rise Time	t _r		53		ns	
Turn-off Delay Time	t _{d(off)}		126		ns	
Fall Time	t _f		85		ns	
Total Gate Charge	Q _G		83		nC	V _{GS} = 10 V,
			51		nC	V _{GS} = 5 V
Gate to Source Charge	Q _{GS}		12		nC	V _{DD} = 15 V, I _D = 34 A
Gate to Drain Charge	Q _{GD}		28		nC	
Body Diode Forward Voltage *1	V _{F(S-D)}		0.8		V	I _F = 34 A, V _{GS} = 0 V
Reverse Recovery Time	t _{rr}		61		ns	I _F = 34 A, V _{GS} = 0 V, di/dt = 100 A/μs
Reverse Recovery Charge	Q _{rr}		64		nC	

Note: *1. Pulsed

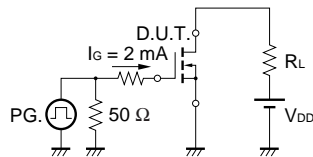
TEST CIRCUIT 1 AVALANCHE CAPABILITY



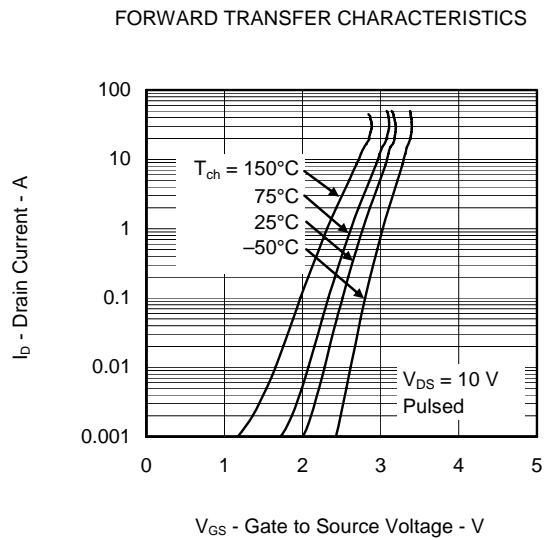
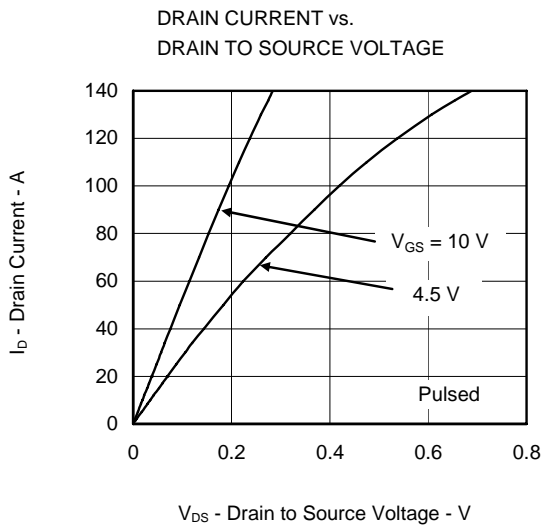
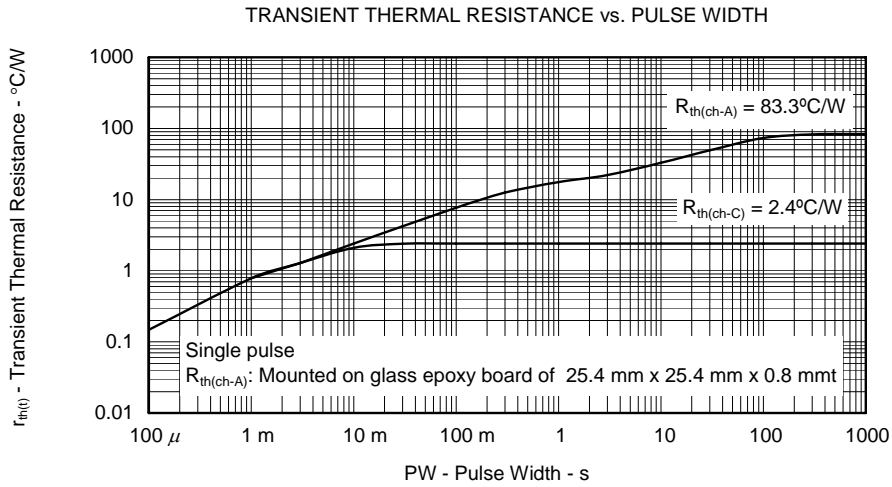
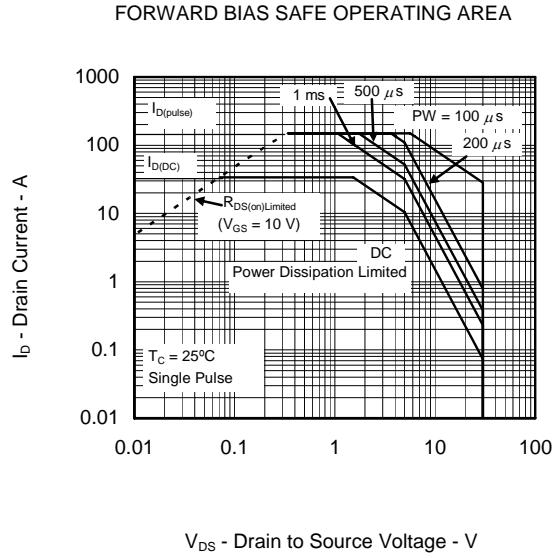
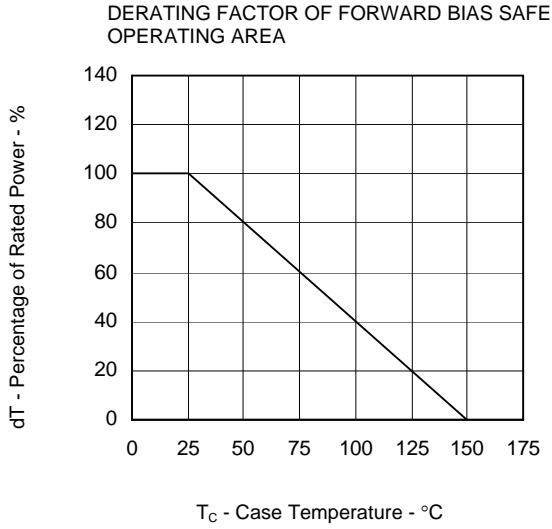
TEST CIRCUIT 2 SWITCHING TIME



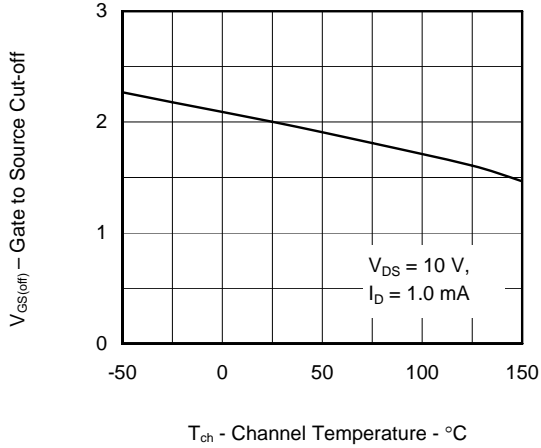
TEST CIRCUIT 3 GATE CHARGE



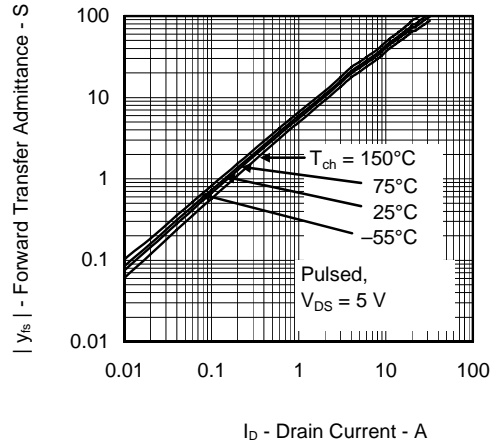
Typical Characteristics (T_A = 25°C)



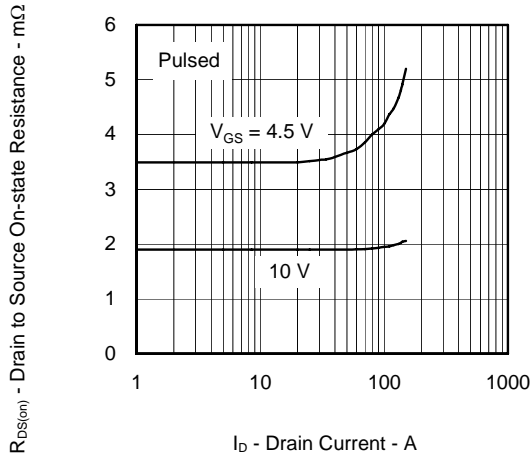
GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



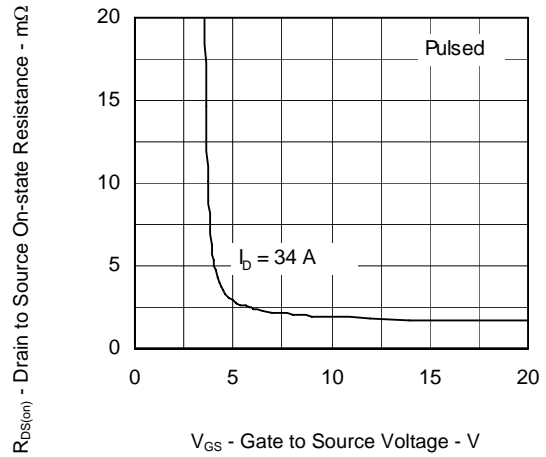
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



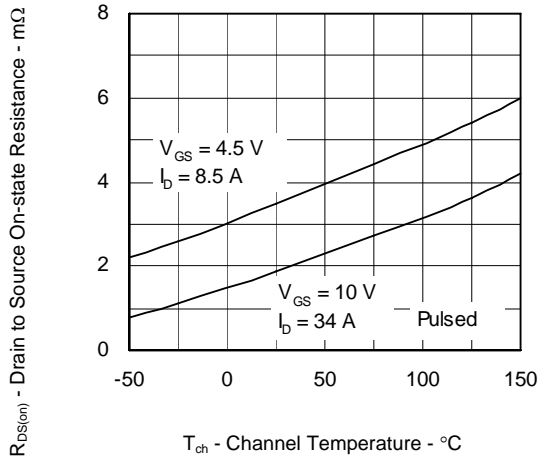
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



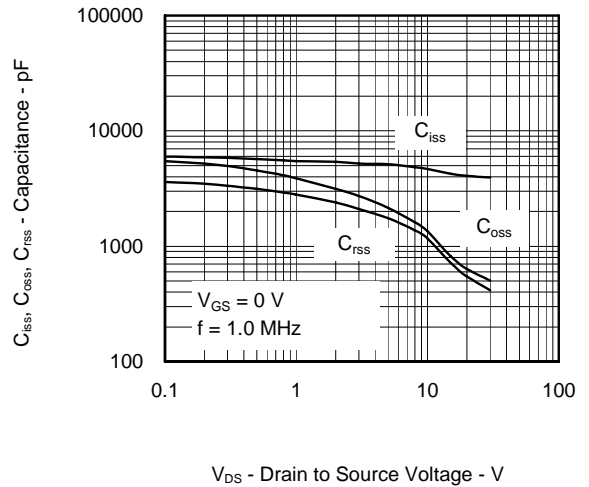
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



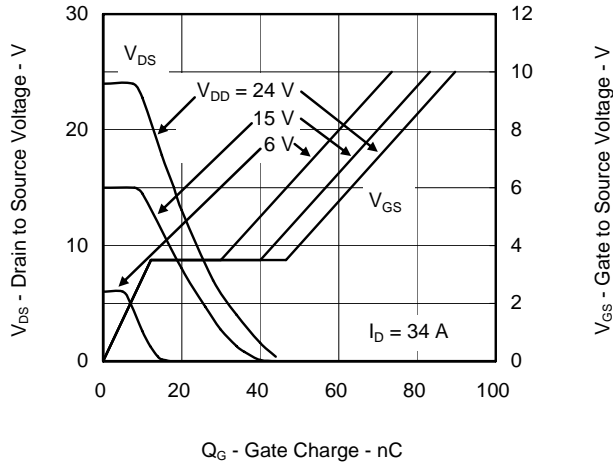
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



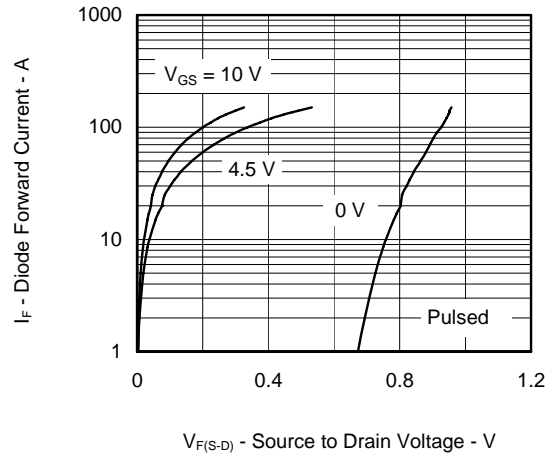
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



DYNAMIC INPUT/OUTPUT CHARACTERISTICS

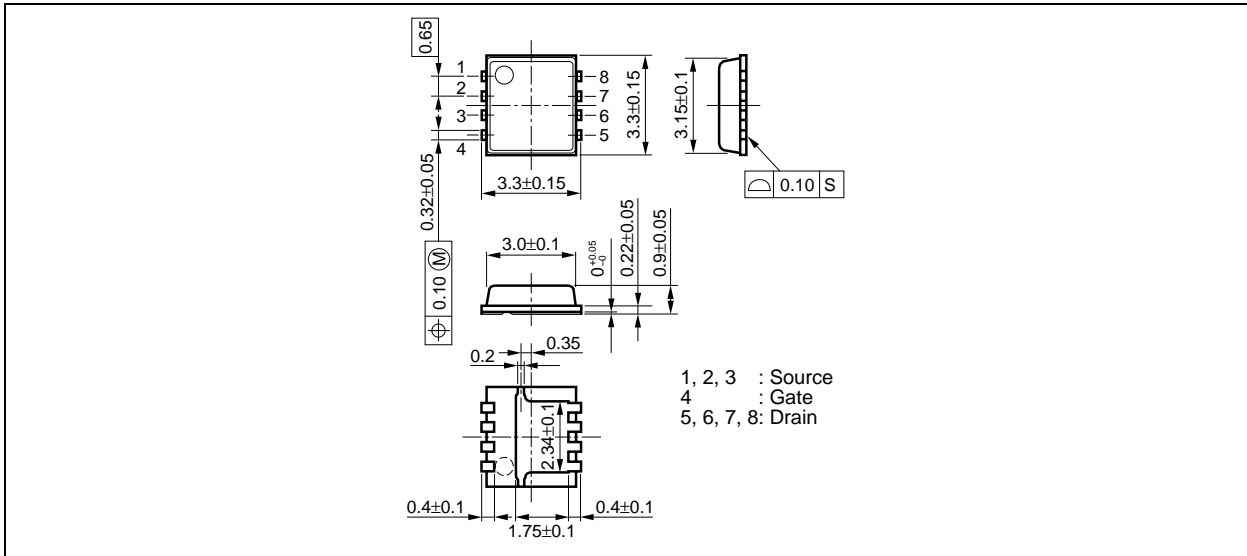


SOURCE TO DRAIN DIODE FORWARD VOLTAGE

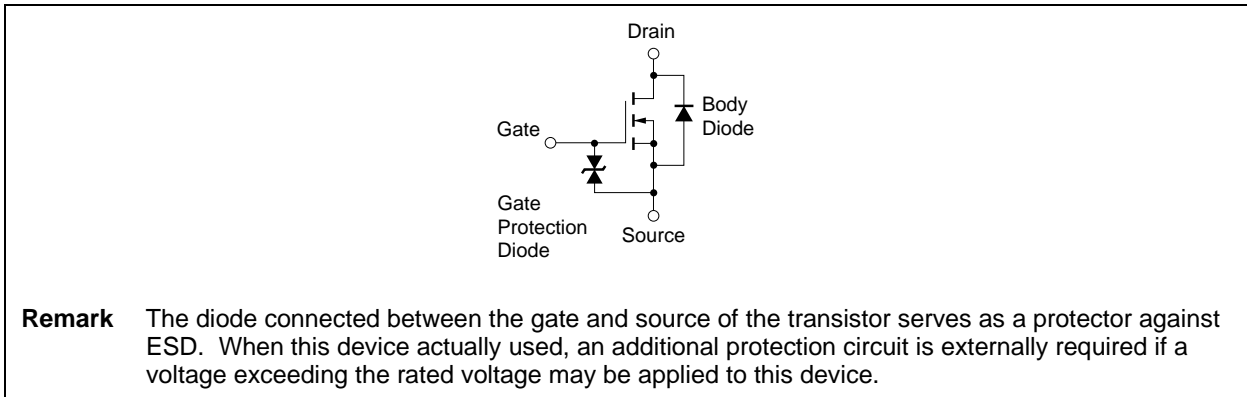


Package Drawings (Unit: mm)

8-pin HVSON (3333)



Equivalent Circuit



Revision History	μPA2822T1L Data Sheet
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Rev.	Date	Description	
		Page	Summary
1.00	May 25, 2012	-	First Edition Issued

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2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.
Tel: +1-408-598-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited

1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada
Tel: +1-905-898-5441, Fax: +1-905-898-3220

Renesas Electronics Europe Limited

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-585-100, Fax: +44-1628-585-900

Renesas Electronics Europe GmbH

Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-65030, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.

7th Floor, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100083, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.

Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

Renesas Electronics Hong Kong Limited

Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2866-9318, Fax: +852-2866-9022/9044

Renesas Electronics Taiwan Co., Ltd.

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

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

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