

2SK3419

Silicon N Channel MOS FET
High Speed Power Switching

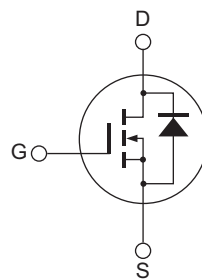
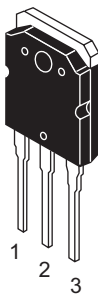
REJ03G1099-0200
(Previous: ADE-208-942)
Rev.2.00
Sep 07, 2005

Features

- Low on-resistance
 $R_{DS(on)} = 4.3 \text{ m}\Omega$ typ.
- 4 V gate drive device
- High speed switching

Outline

RENESAS Package code: PRSS0004ZE-A
(Package name: TO-3P)



1. Gate
2. Drain (Flange)
3. Source

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V _{DSS}	60	V
Gate to source voltage	V _{GSS}	±20	V
Drain current	I _D	90	A
Drain peak current	I _{D (pulse)} ^{Note 1}	360	A
Body-drain diode reverse drain current	I _{DR}	90	A
Avalanche current	I _{AP} ^{Note 3}	65	A
Avalanche energy	E _{AR} ^{Note 3}	362	mJ
Channel dissipation	P _{ch} ^{Note 2}	150	W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

- Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
 2. Value at T_c = 25°C
 3. Value at T_{ch} = 25°C, R_g ≥ 50 Ω

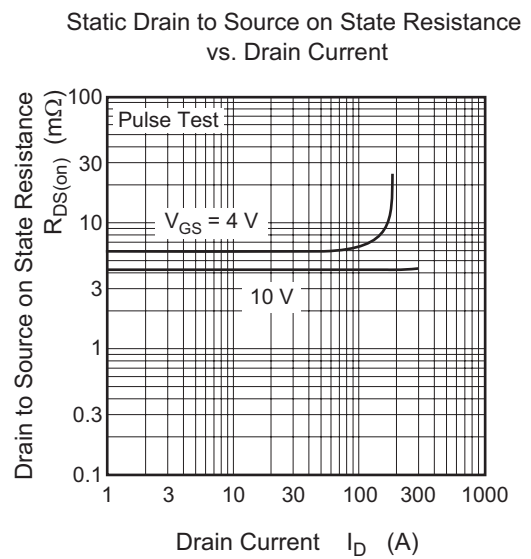
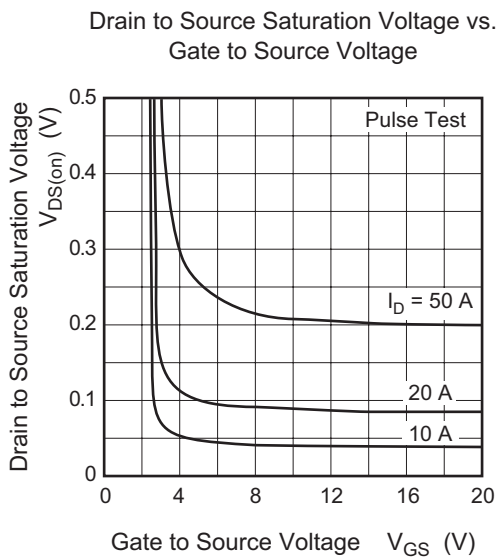
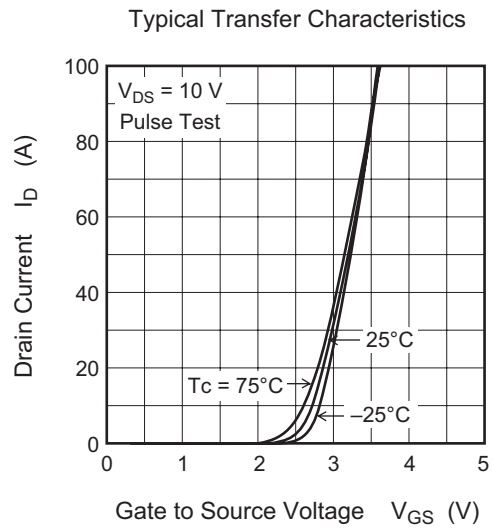
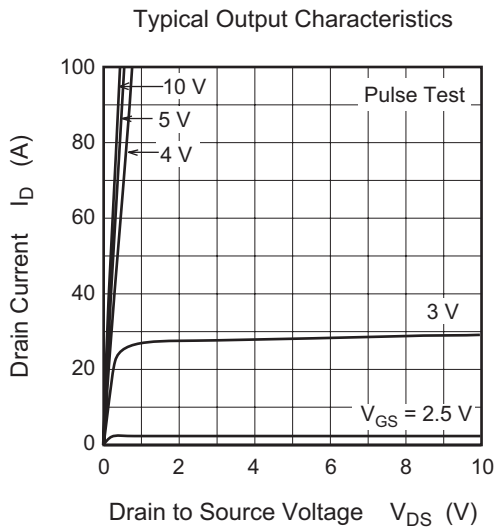
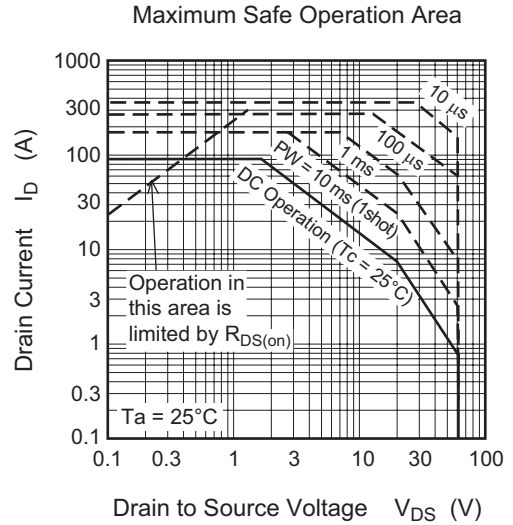
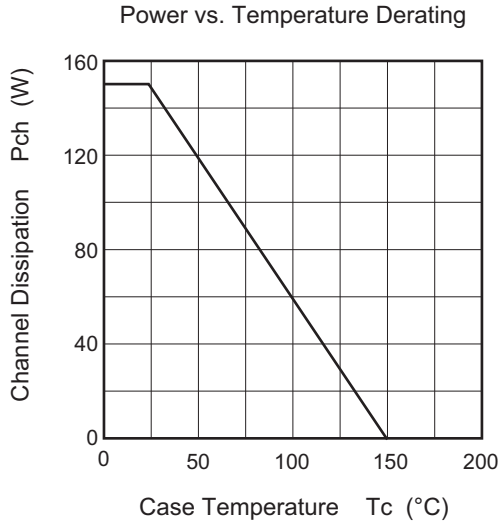
Electrical Characteristics

(Ta = 25°C)

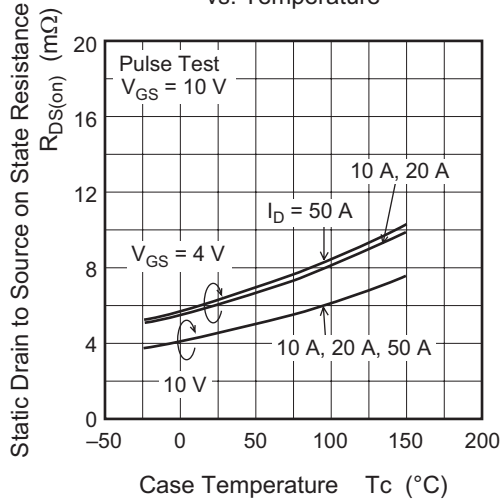
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V _{(BR)DSS}	60	—	—	V	I _D = 10 mA, V _{GS} = 0
Zero gate voltage drain current	I _{DSS}	—	—	10	μA	V _{DS} = 60 V, V _{GS} = 0
Gate to source leak current	I _{GSS}	—	—	±0.1	μA	V _{GS} = ±20 V, V _{DS} = 0
Gate to source cutoff voltage	V _{GS (off)}	1.0	—	2.5	V	V _{DS} = 10 V, I _D = 1 mA ^{Note 4}
Forward transfer admittance	y _{fs}	55	90	—	S	I _D = 45 A, V _{DS} = 10 V ^{Note 4}
Static drain to source on state resistance	R _{DS (on)}	—	4.3	5.5	mΩ	I _D = 45 A, V _{GS} = 10 V ^{Note 4}
	R _{DS (on)}	—	6.0	9.0	mΩ	I _D = 45 A, V _{GS} = 4 V ^{Note 4}
Input capacitance	C _{iss}	—	9770	—	pF	V _{DS} = 10 V V _{GS} = 0 f = 1 MHz
Output capacitance	C _{oss}	—	1340	—	pF	
Reverse transfer capacitance	C _{rss}	—	470	—	pF	
Total gate charge	Q _g	—	180	—	nC	V _{DD} = 50 V V _{GS} = 10 V I _D = 90 A
Gate to source charge	Q _{gs}	—	32	—	nC	
Gate to drain charge	Q _{gd}	—	36	—	nC	
Turn-on delay time	t _{d (on)}	—	53	—	ns	V _{GS} = 10 V I _D = 45 A R _L = 0.67 Ω
Rise time	t _r	—	320	—	ns	
Turn-off delay time	t _{d (off)}	—	700	—	ns	
Fall time	t _f	—	380	—	ns	
Body-drain diode forward voltage	V _{DF}	—	1.0	—	V	I _F = 90 A, V _{GS} = 0
Body-drain diode reverse recovery time	t _{rr}	—	75	—	ns	I _F = 90 A, V _{GS} = 0 di _F /dt = 50 A/μs

Note: 4. Pulse test

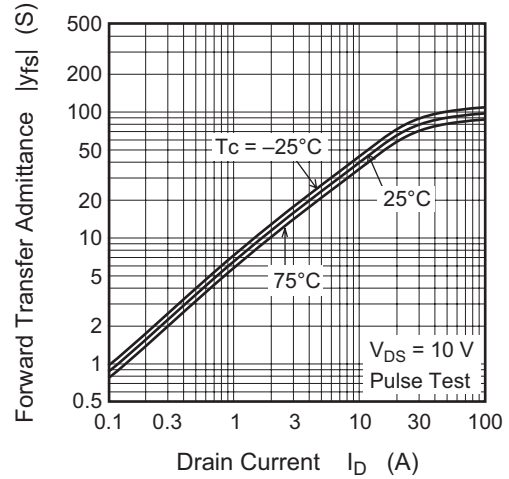
Main Characteristics



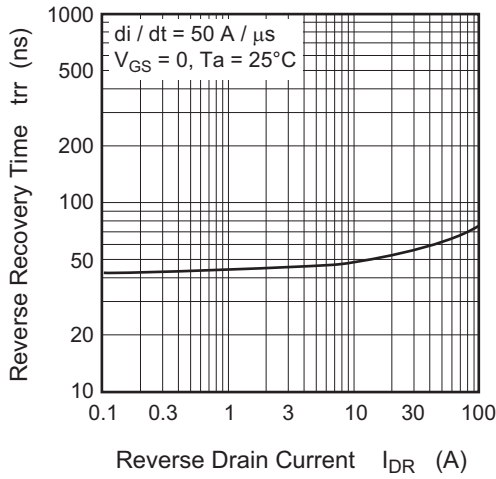
Static Drain to Source on State Resistance vs. Temperature



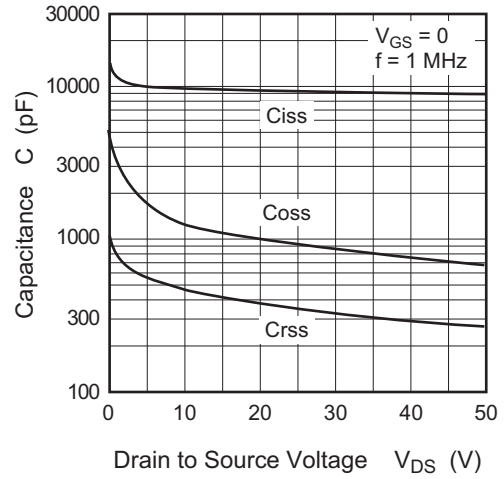
Forward Transfer Admittance vs. Drain Current



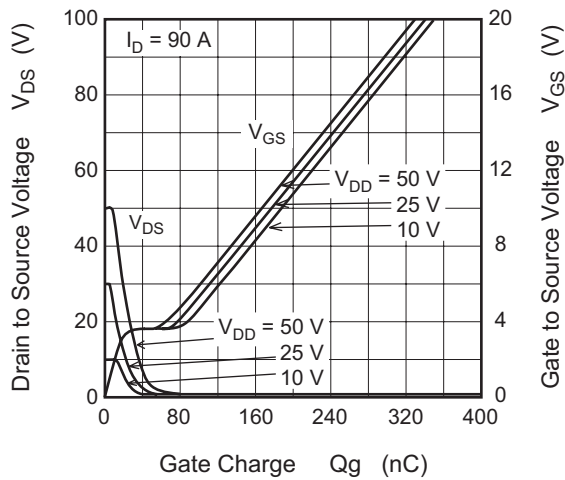
Body-Drain Diode Reverse Recovery Time



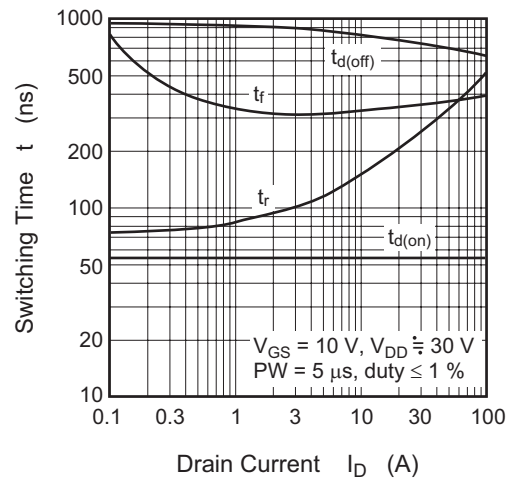
Typical Capacitance vs. Drain to Source Voltage

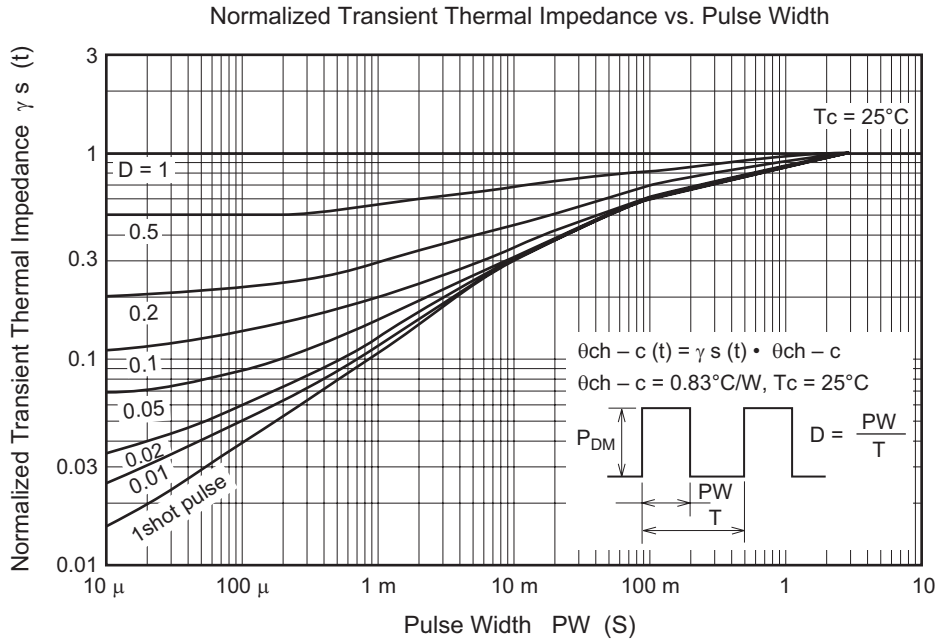
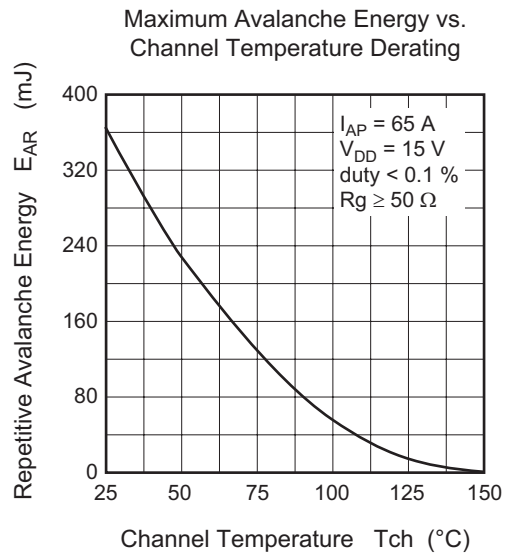
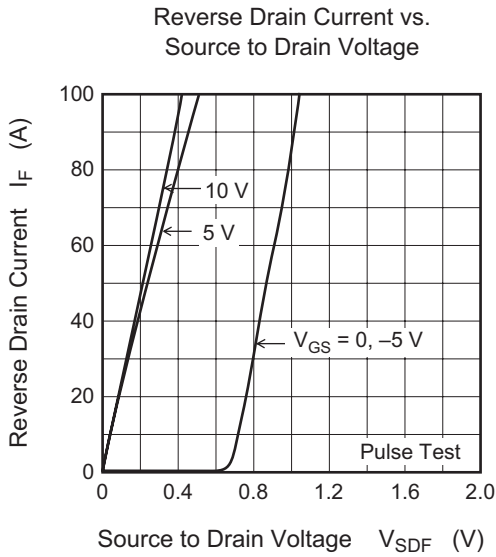


Dynamic Input Characteristics

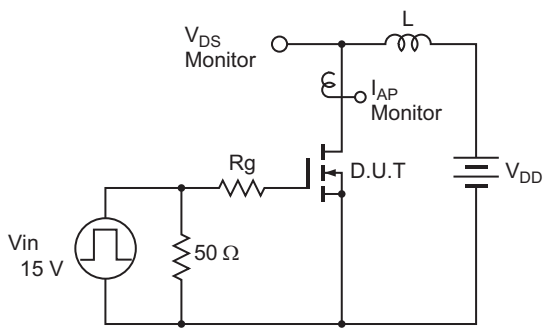


Switching Characteristics



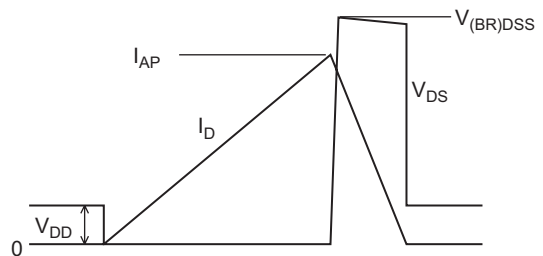


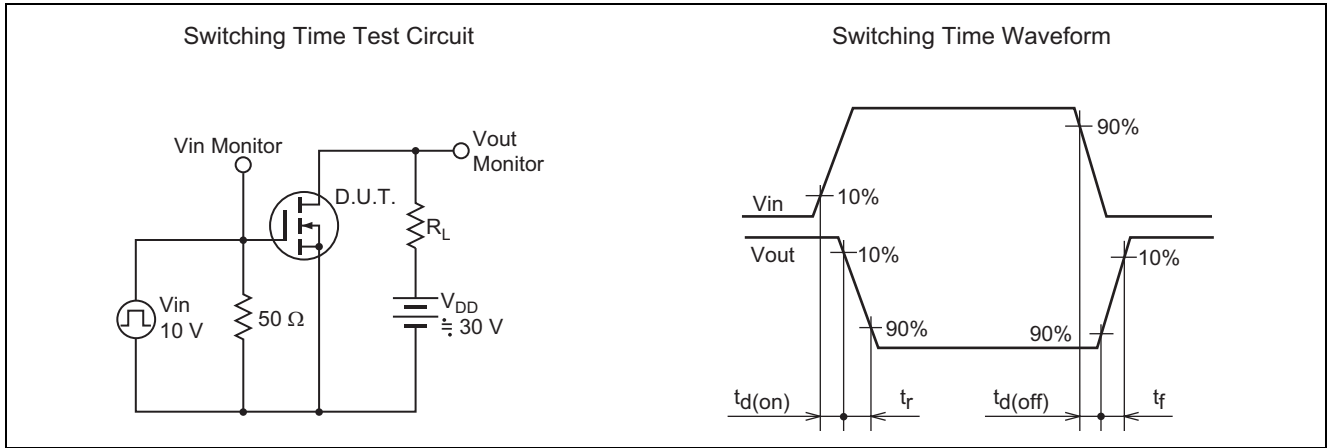
Avalanche Test Circuit



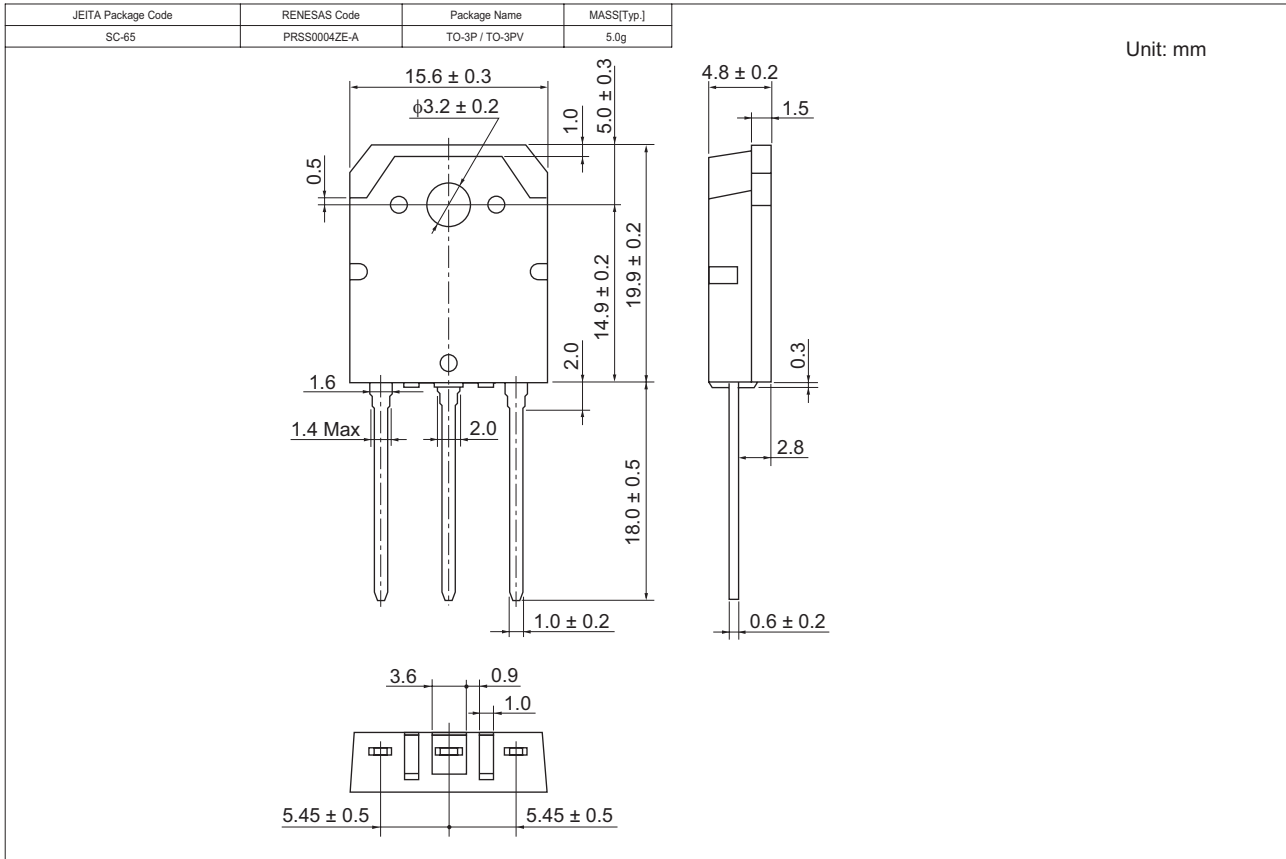
Avalanche Waveform

$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$





Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
2SK3419-E	30 pcs	Plastic magazine

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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