To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

Send any inquiries to http://www.renesas.com/inquiry.

[Package Change]

Date: Dec.01.2008

RENESAS TECHNICAL UPDATE

Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Renesas Technology Corp.

Product Category	Transistors		Document No.	TN-PTR-A002A/E	Rev.	1.00
Title	Change of TO－3P Package for Power MOSFET		Information Category	Change of Package		
Applicable Product	TO－3P Package Power MOSFET (FK & FS series) *Please refer to attached table 1.	Lot No. All	Reference Document	Application note 「AP08933-E」		

1． Outline

The package of 14 products of attached table.1 is standardized for the stable supply and the productivity improvement.

2. Content of change

2－1. Externals size:Please refer to the red frame part in attached Fig1.

2－2. Product type name:Please refer to the present type name & the changed type name in attached table1.

3. Others

3－1. Wafer process manufacturing:There is no change.

3－2. Assembly & TEST process manufacturing:The manufacturing factory doesn’t have change.

Fundamental materials don't have the change.

(Resin=incombustibility material and Frame=made of Cu etc.)

4. Amplification

Neither a marking specification, a maximum rating nor electric characteristics have the change for this change.

And the problem is not in the reliability test without the defect.

5. Schedule

Production of new package will start from Apr./2009.

Table1. Target product type name

No.	Present Name	Changed Name
1	FK18SM-9 B00	FK18SM-9 B10
2	FK18SM-10 B00	FK18SM-10 B10
3	FK18SM-12 B00	FK18SM-12 B10
4	FK20SM-10 B00	FK20SM-10 B10
5	FK25SM-5 B00	FK25SM-5 B10
6	FK25SM-6 B00	FK25SM-6 B10
7	FK30SM-5 B00	FK30SM-5 B10
8	FK30SM-6 B00	FK30SM-6 B10
9	FS22SM-12A B00	FS22SM-12A B10
10	FS25SM-9A B00	FS25SM-9A B10
11	FS25SM-10A B00	FS25SM-10A B10
12	FS40SM-6A B00	FS40SM-6A B10
13	FS50SM-5A 300	Production stoppage
14	FS50SM-5A B00	FS50SM-5A B10
15	FS50SM-5A C01	FS50SM-5A C02

unit:mm

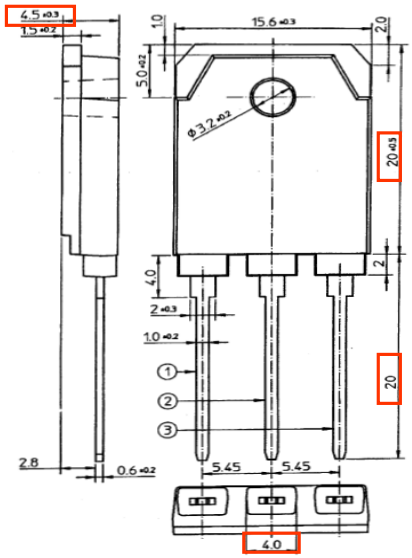
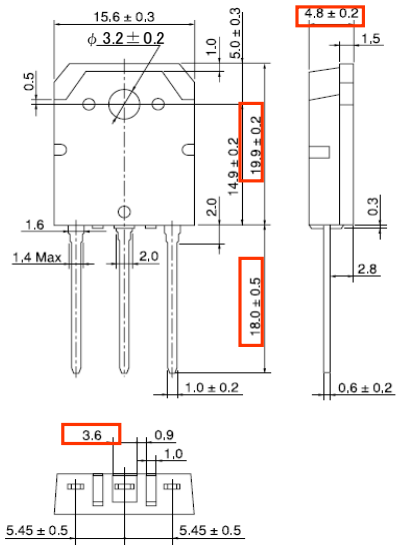
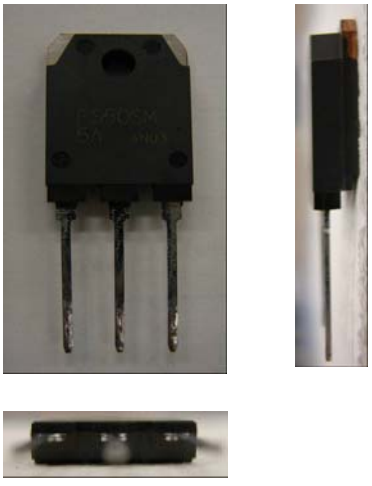
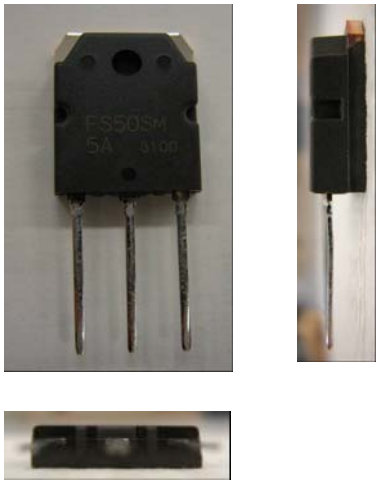
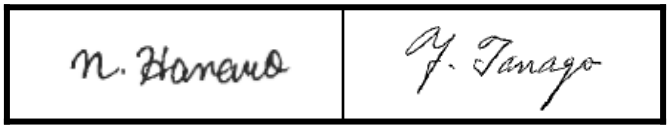
	Present goods	Change goods
Dimensional outline drawing		
Externals photograph		

Fig1. The comparison of present and change goods

Change of TO-3P Package for Power MOSFET (FK & FS Series)

Renesas Technology Corp.
High Power Device Design Dept.

Sep.12.2008



AP08933-E Rev. 1.00

1. Outline of Change

(1). Purpose

The products of TO－3P package of FK & FS series are standardized for the stable supply and the productivity improvement.

(2). Change part

Please refer to the red frame parts in figure of 3 and 4 pages about the change of externals size.
Moreover tightening torque strength are changed. Please refer to the following.

Item	Present goods			Change goods		
	MIN	TYP	MAX	MIN	TYP	MAX
Tightening torque strength [N・m]	–	0.59	0.98	0.60	–	0.80

(3). Others

(a). Wafer process manufacturing : There is no change.
(b). Assembly & TEST process manufacturing :
The manufacturing factory doesn't have the change.
Fundamental materials don’t have the change.
(Resin=incombustibility material and Frame=made of Copper)

(4). Schedule

From Apr.2009

We judged this change is no problem. Please cooperate for this change.
*However, Renesas Technology responds to the adjustment if your approval period is necessity.

Unit:mm

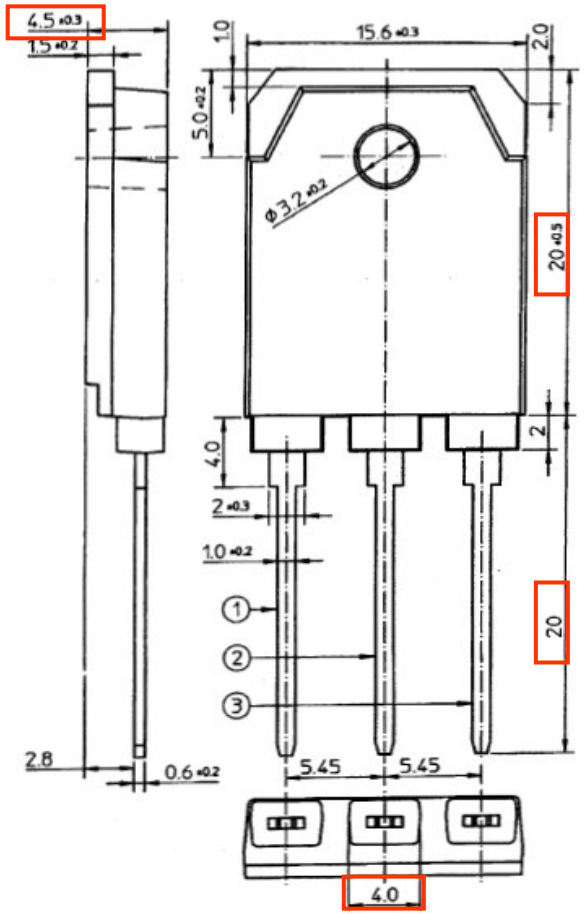
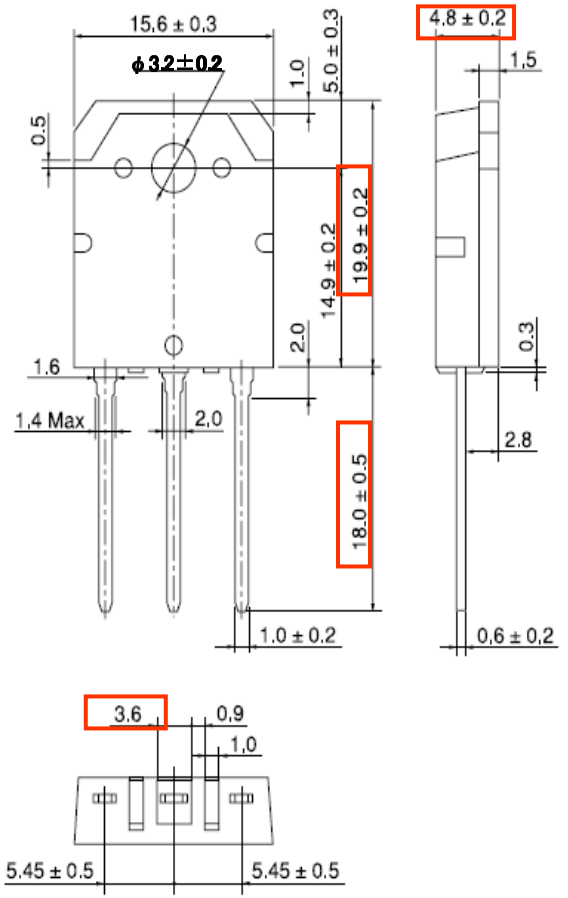
	Present goods	Change goods
Dimensional outline drawing		

Fig1. Dimensional outline drawing

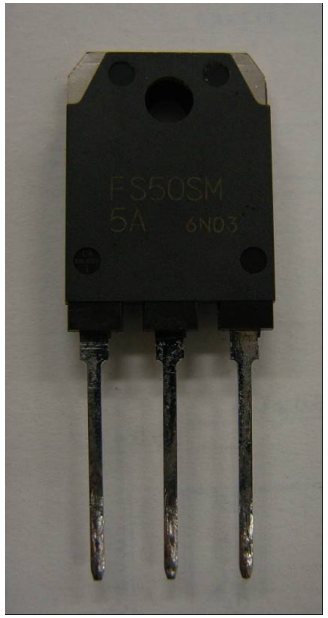
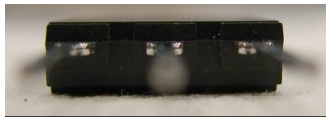
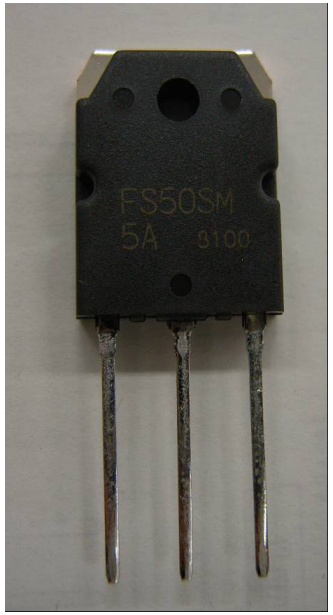
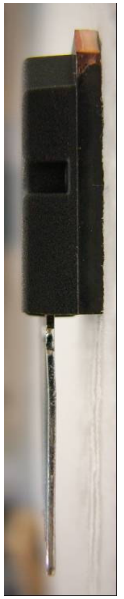
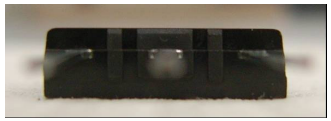
	Present goods	Change goods
Externals photograph	  	  

Fig.2 Externals photograph

2. The comparison of electric characteristics results

As representative FS50SM-5A under mass production, electric characteristics of present goods and change goods were compared.

①. The comparison of Electric characteristics（Specification description item):Table 1
②. The ability comparison of main characteristic item:Fig 3

As results, there was no significant difference between present goods and change goods.

Table1. The comparison of Electric characteristics

No.	Item	Symbol	Unit	Condition	Number of evaluations	Characteristics Value						Judgement
						Present goods			Change goods			
						Ave	Cp	Cpk	Ave	Cp	Cpk	
1	Drain-source voltage	V(BR)DSS	V	I_D=1mA, V_{GS}=0V, Tch=25℃	Present goods:100p/Lot×12Lot Change goods:100p/Lot×1Lot	295	over 2	-	291	over 2	-	○
2	Gate-source voltage(+)	V(BR)GSS+	V	I_G=+100uA, V_{DS}=0V, Tch=25℃		60	over 2	-	60	over 2	-	○
3	Gate-source voltage(-)	V(BR)GSS-	V	I_G=-100uA, V_{DS}=0V, Tch=25℃		58	over 2	-	58	over 2	-	○
4	Drain-source leakage current	IDSS	uA	V_{DS}=250V, V_{GS}=0V, Tch=25℃		0.009	over 2	-	0.003	over 2	-	○
5	Gate-source leakage current(+)	IGSS+	uA	V_{GS}=+25V, V_{DS}=0V, Tch=25℃		0.19	over 2	-	0.18	over 2	-	○
6	Gate-source leakage current(-)	IGSS-	uA	V_{GS}=-25V, V_{DS}=0V, Tch=25℃		0.20	over 2	-	0.19	over 2	-	○
7	Gate-source threshold voltage	VGS(th)	V	V_{DS}=10V, I_D=1mA, Tch=25℃		3.29	-	over 2	3.28	-	over 2	○
8	Drain-source resistance	rDS(ON)	Ω	I_D=25A, V_{GS}=10V, Tch=25℃		0.057	over 2	-	0.055	over 2	-	○
9	Drain-source on voltage	VDS(ON)	V	I_D=25A, V_{GS}=10V, Tch=25℃		1.42	over 2	-	1.38	over 2	-	○
10	Forward transadmittance	|yfs|	S	I_D=25A, V_{DS}=10V, Tch=25℃		31.5	-	-	31.8	-	-	○
11	Input capacitance	Ciss	pF	V_{DS}=25V, V_{GS}=0V		3416	-	-	3411	-	-	○
12	Output capacitance	Coss	pF	f=1MHz		505	-	-	510	-	-	○
13	Reverse transfer capacitance	Crss	pF	Tch=25℃		53	-	-	57	-	-	○
14	Turn-on delay time	td(on)	ns	V_{DD}=150V, I_D=25A	Present goods:10p/Lot×12Lot Change goods:30p/Lot×1Lot	55	-	over 2	56	-	over 2	○
15	Rise time	tr	ns	V_{GS}=10V		116	-	over 2	110	-	over 2	○
16	Turn-off delay time	td(off)	ns	R_{GEN}=R_{GS}=50Ω		268	-	over 2	286	-	over 2	○
17	Fall time	tf	ns	Tch=25℃		98	-	over 2	91	-	over 2	○
18	Source-drain voltage	VSD	V	I_S=25A, V_{GS}=0V, Tch=25℃	Similar to No.1-No.13	1.23	over 2	-	1.18	over 2	-	○
19	Thermal resistance	Rth(ch-c)	℃/W	I_S=25A, V_{GS}=0V, Tch=25℃	Present goods:10p/Lot×3Lot Change goods:30p/Lot×1Lot	0.320	over 2	-	0.326	over 2	-	○
20	Avalanche destruction point	IDA	A	L=200uH, Tch=25℃		94.0	over 2	-	96.0	over 2	-	○

○ : No problem

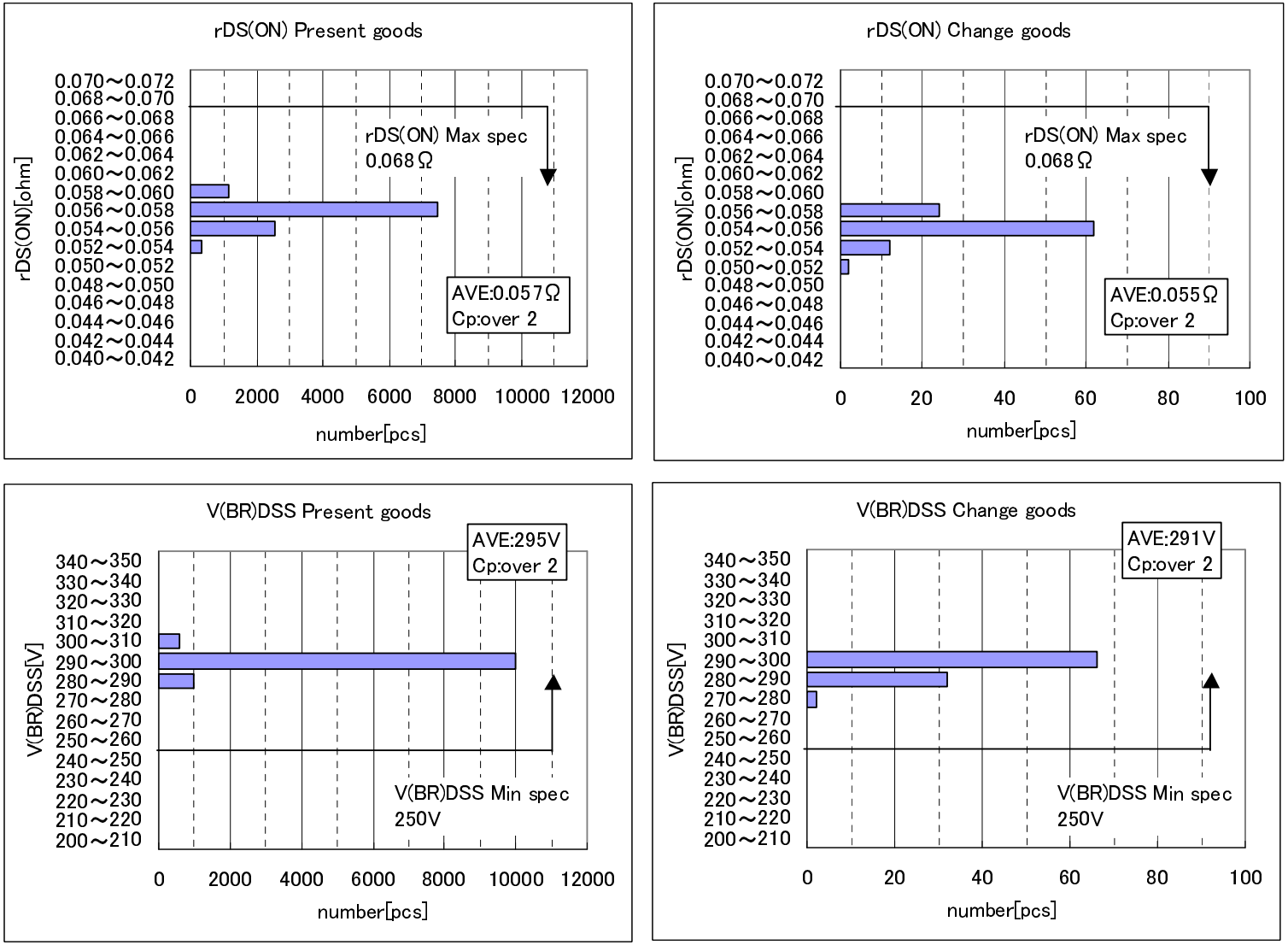
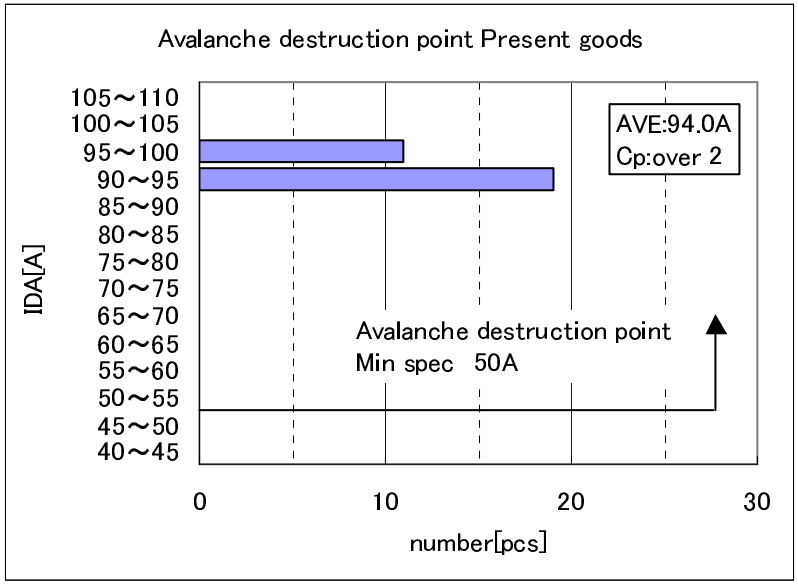
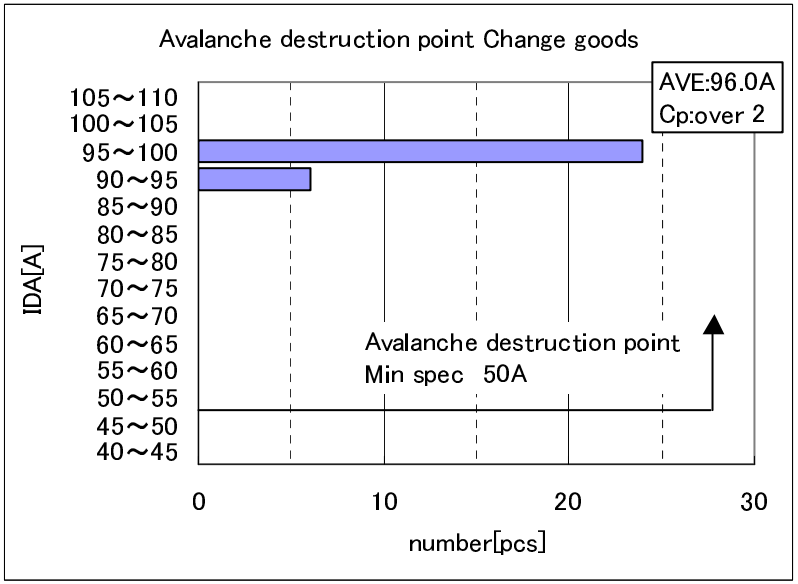


Fig3. The ability comparison of main characteristic item





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