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April 1<sup>st</sup>, 2010 Renesas Electronics Corporation

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## 2SK3419

# Silicon N Channel MOS FET High Speed Power Switching

REJ03G1099-0200

(Previous: ADE-208-942)

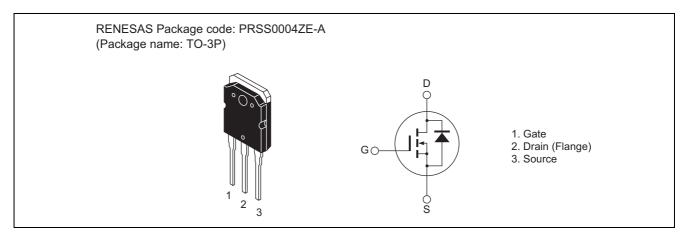
Rev.2.00

Sep 07, 2005

## **Features**

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

#### **Outline**



## **Absolute Maximum Ratings**

 $(Ta = 25^{\circ}C)$ 

Item	Symbol	Value	Unit
Drain to source voltage	V <sub>DSS</sub>	60	V
Gate to source voltage	V <sub>GSS</sub>	±20	V
Drain current	I <sub>D</sub>	90	A
Drain peak current	I <sub>D (pulse)</sub> Note 1	360	A
Body-drain diode reverse drain current	I <sub>DR</sub>	90	A
Avalanche current	I <sub>AP</sub> Note 3	65	A
Avalanche energy	E <sub>AR</sub> Note 3	362	mJ
Channel dissipation	Pch Note 2	150	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

Notes: 1. PW  $\leq$  10  $\mu$ s, duty cycle  $\leq$  1%

2. Value at  $Tc = 25^{\circ}C$ 

3. Value at Tch = 25°C, Rg  $\geq$  50  $\Omega$ 

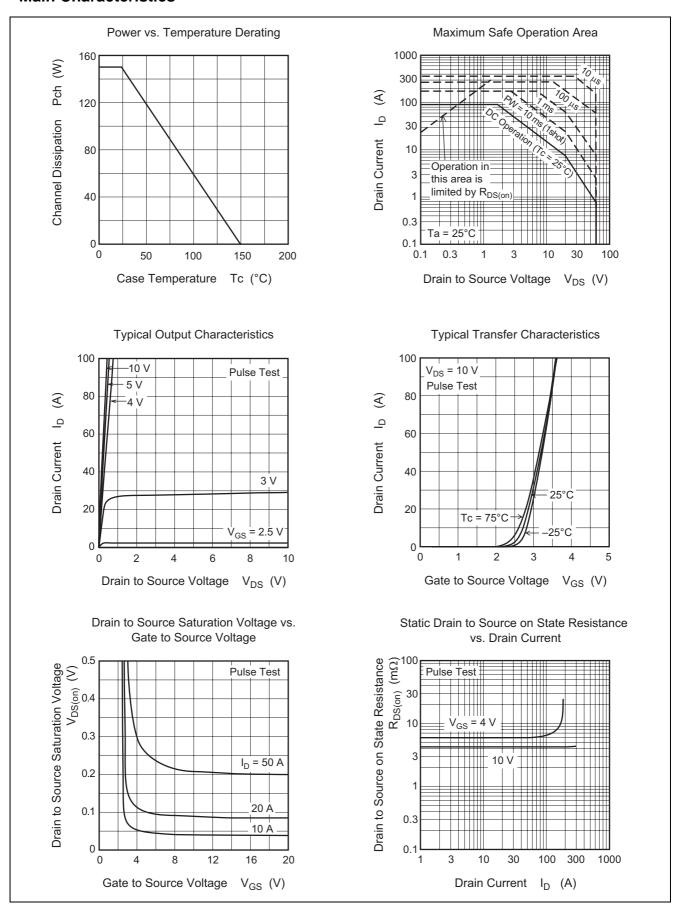
## **Electrical Characteristics**

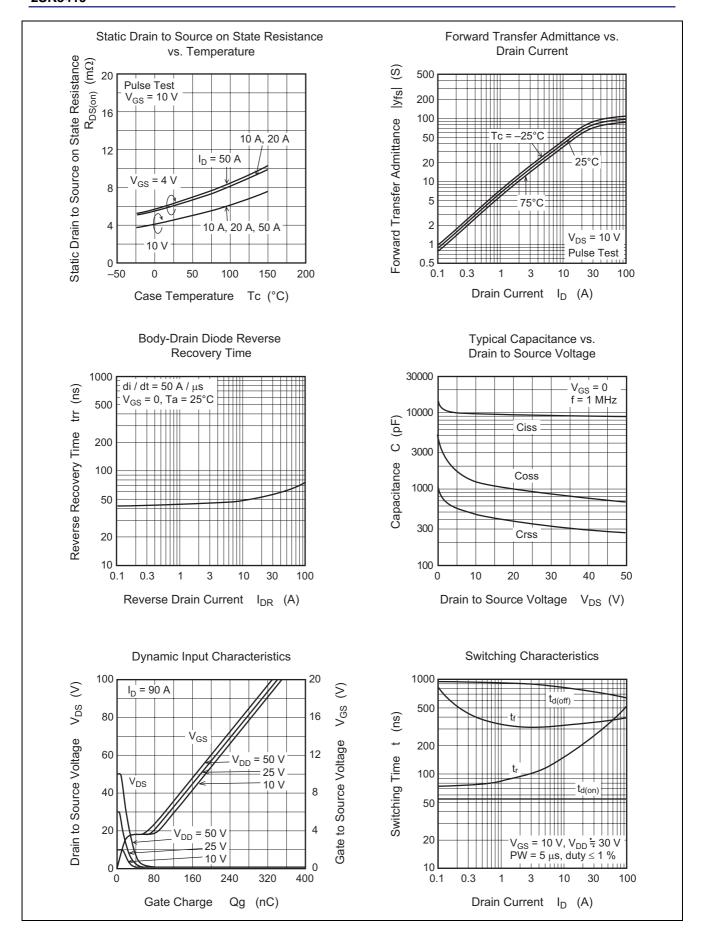
 $(Ta = 25^{\circ}C)$ 

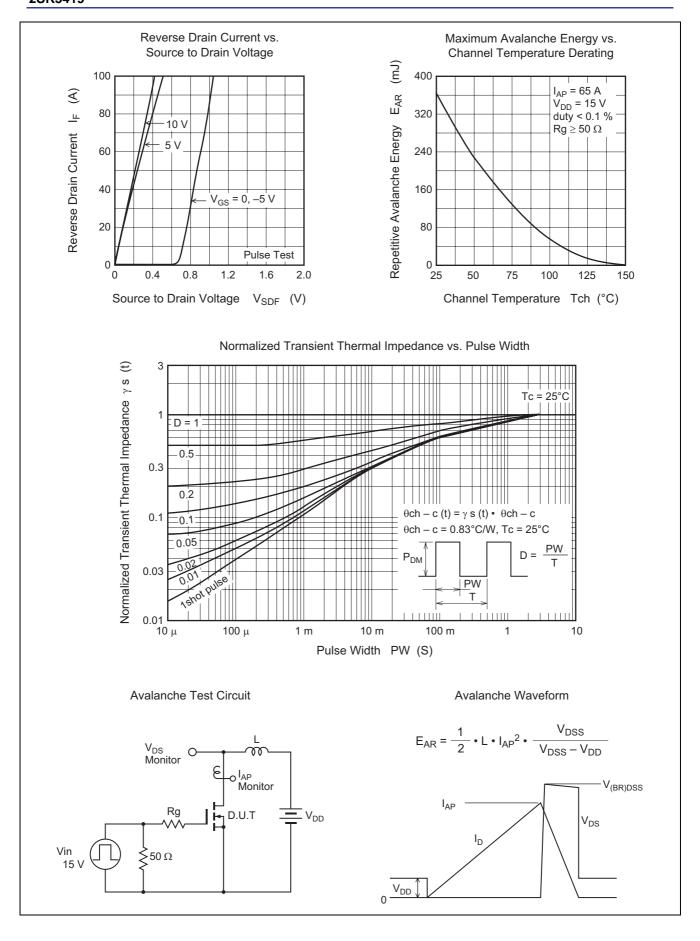
Item	Symbol	Min	Тур	Max	Unit	Test Conditions
Drain to source breakdown voltage	V <sub>(BR) DSS</sub>	60	_	_	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Zero gate voltage drain current	I <sub>DSS</sub>	_	_	10	μΑ	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0
Gate to source leak current	I <sub>GSS</sub>	_	_	±0.1	μΑ	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0$
Gate to source cutoff voltage	V <sub>GS (off)</sub>	1.0	_	2.5	V	$V_{DS} = 10 \text{ V}, I_{D} = 1 \text{ mA}^{Note 4}$
Forward transfer admittance	y <sub>fs</sub>	55	90	_	S	$I_D = 45 \text{ A}, V_{DS} = 10 \text{ V}^{\text{Note 4}}$
Static drain to source on state resistance	R <sub>DS (on)</sub>	_	4.3	5.5	mΩ	$I_D = 45 \text{ A}, V_{GS} = 10 \text{ V}^{\text{Note 4}}$
	R <sub>DS (on)</sub>	_	6.0	9.0	mΩ	I <sub>D</sub> = 45 A, V <sub>GS</sub> = 4 V Note 4
Input capacitance	Ciss	_	9770	_	pF	V <sub>DS</sub> = 10 V
Output capacitance	Coss	_	1340	_	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	_	470	_	pF	f = 1 MHz
Total gate charge	Qg	_	180	_	nC	V <sub>DD</sub> = 50 V
Gate to source charge	Qgs	_	32	_	nC	V <sub>GS</sub> = 10 V
Gate to drain charge	Qgd	_	36	_	nC	I <sub>D</sub> = 90 A
Turn-on delay time	t <sub>d (on)</sub>	_	53	_	ns	V <sub>GS</sub> = 10 V
Rise time	t <sub>r</sub>	_	320	_	ns	I <sub>D</sub> = 45 A
Turn-off delay time	t <sub>d (off)</sub>	_	700	_	ns	$R_L = 0.67 \Omega$
Fall time	t <sub>f</sub>	_	380		ns	
Body-drain diode forward voltage	$V_{DF}$	_	1.0		V	I <sub>F</sub> = 90 A, V <sub>GS</sub> = 0
Body-drain diode reverse recovery time	t <sub>rr</sub>	_	75	_	ns	$I_F = 90 \text{ A}, V_{GS} = 0$
						$di_F/dt = 50 A/\mu s$

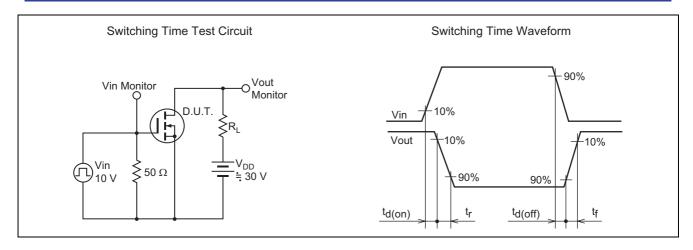
Note: 4. Pulse test

### **Main Characteristics**

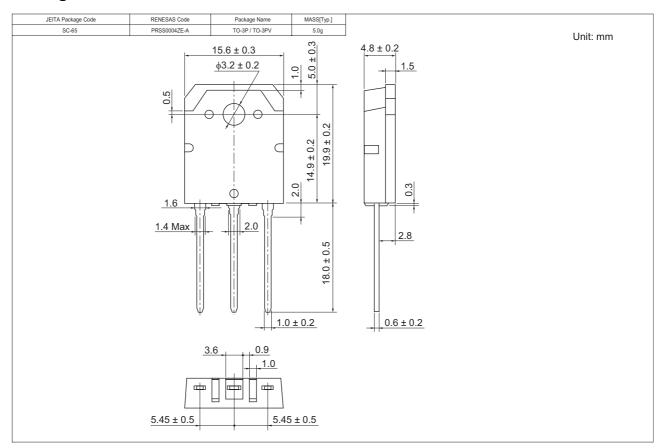








## **Package Dimensions**



## **Ordering Information**

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

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