

# 2SK1169, 2SK1170

Silicon N Channel MOS FET

REJ03G0916-0200  
(Previous: ADE-208-1254)  
Rev.2.00  
Sep 07, 2005

## Application

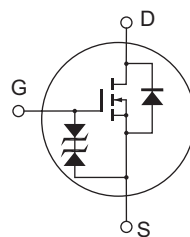
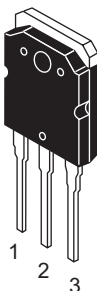
High speed power switching

## Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator and DC-DC converter

## 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	Ratings	Unit
Drain to source voltage	2SK1169	$V_{DSS}$	450	V
	2SK1170		500	
Gate to source voltage		$V_{GSS}$	$\pm 30$	V
Drain current		$I_D$	20	A
Drain peak current		$I_{D(pulse)}^{*1}$	80	A
Body to drain diode reverse drain current		$I_{DR}$	20	A
Channel dissipation		$P_{ch}^{*2}$	120	W
Channel temperature		$T_{ch}$	150	°C
Storage temperature		$T_{stg}$	-55 to +150	°C

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$ 2. Value at  $T_C = 25^\circ C$ 

## Electrical Characteristics

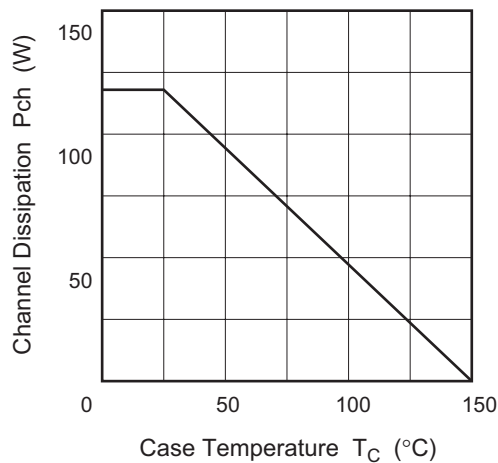
(Ta = 25°C)

Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1169	$V_{(BR)DSS}$	450	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
	2SK1170		500				
Gate to source breakdown voltage		$V_{(BR)GSS}$	$\pm 30$	—	—	V	$I_G = \pm 100 \mu A$ , $V_{DS} = 0$
Gate to source leak current		$I_{GSS}$	—	—	$\pm 10$	$\mu A$	$V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	2SK1169	$I_{DSS}$	—	—	250	$\mu A$	$V_{DS} = 360 \text{ V}$ , $V_{GS} = 0$
	2SK1170						$V_{DS} = 400 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage		$V_{GS(off)}$	2.0	—	3.0	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	2SK1169	$R_{DS(on)}$	—	0.20	0.25	$\Omega$	$I_D = 10 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*3}$
	2SK1170		—	0.22	0.27		
Forward transfer admittance		$ y_{fs} $	10	16	—	S	$I_D = 10 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*3}$
Input capacitance		$C_{iss}$	—	2800	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance		$C_{oss}$	—	780	—	pF	
Reverse transfer capacitance		$C_{rss}$	—	90	—	pF	
Turn-on delay time		$t_{d(on)}$	—	32	—	ns	$I_D = 10 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_L = 3 \Omega$
Rise time		$t_r$	—	115	—	ns	
Turn-off delay time		$t_{d(off)}$	—	200	—	ns	
Fall time		$t_f$	—	90	—	ns	
Body to drain diode forward voltage		$V_{DF}$	—	1.0	—	V	$I_F = 20 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time		$t_{rr}$	—	500	—	ns	$I_F = 20 \text{ A}$ , $V_{GS} = 0$ , $di_F/dt = 100 \text{ A}/\mu s$

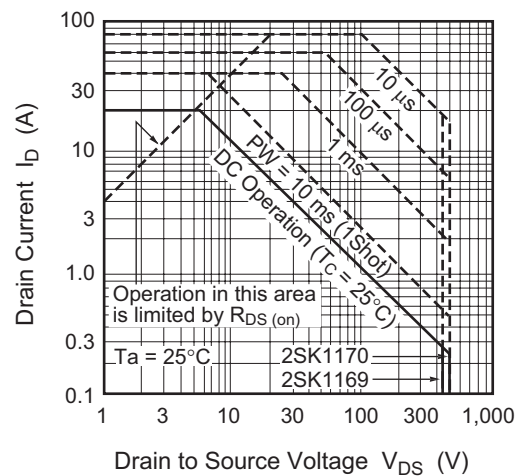
Note: 3. Pulse test

## Main Characteristics

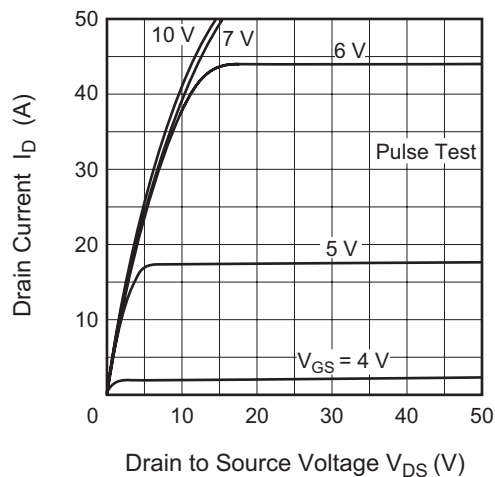
Power vs. Temperature Derating



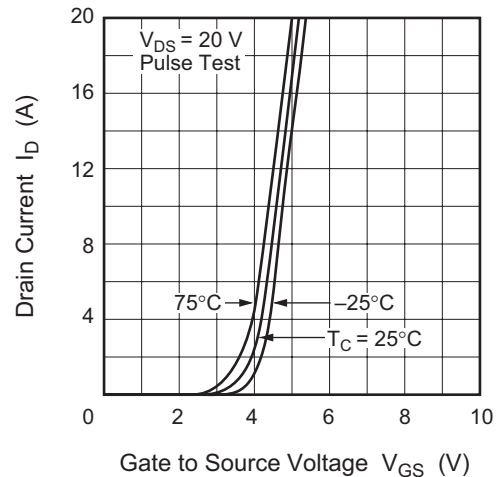
Maximum Safe Operation Area



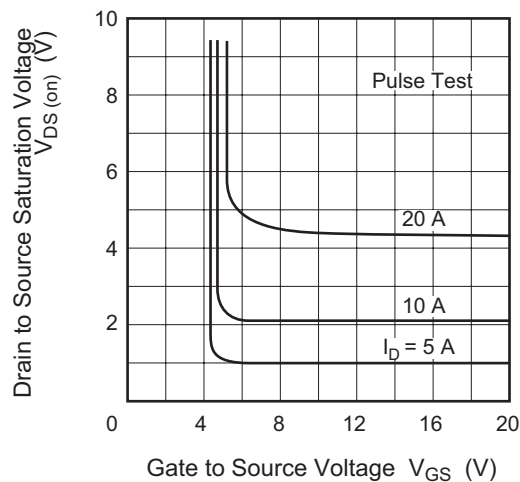
Typical Output Characteristics



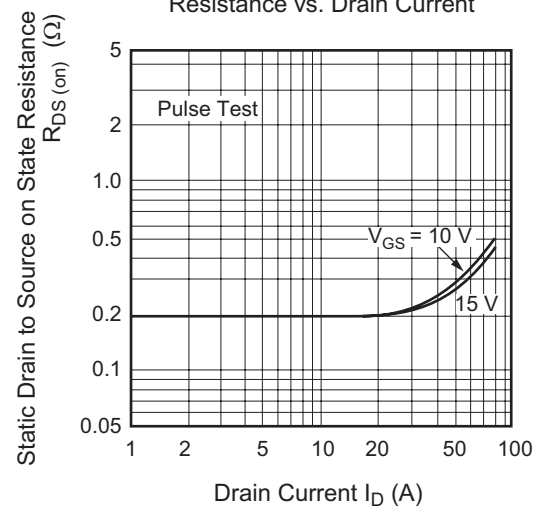
Typical Transfer Characteristics

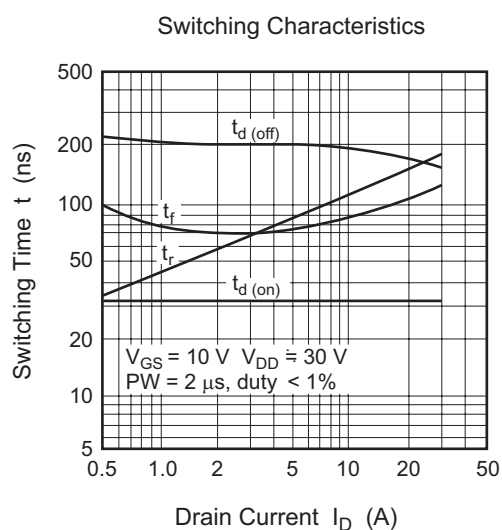
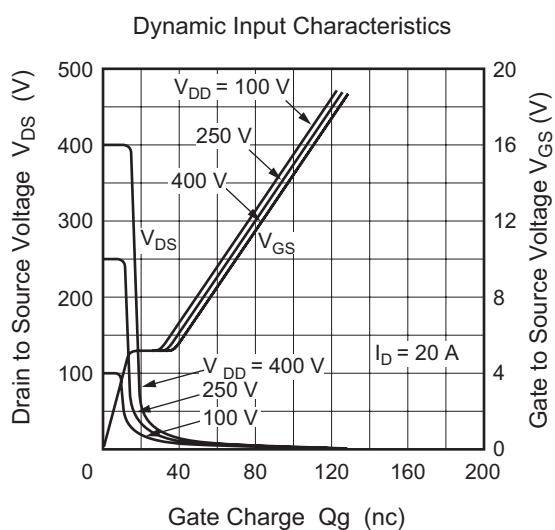
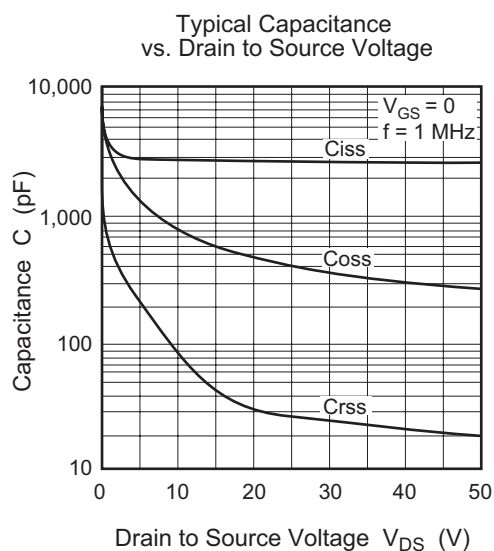
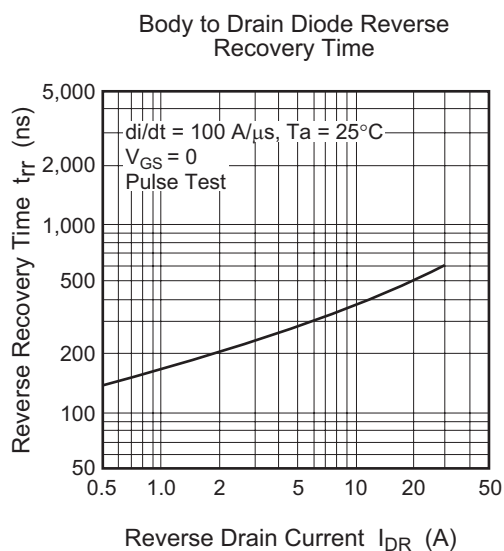
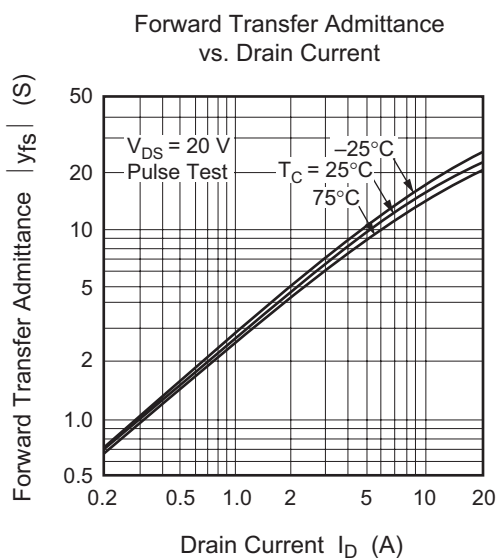
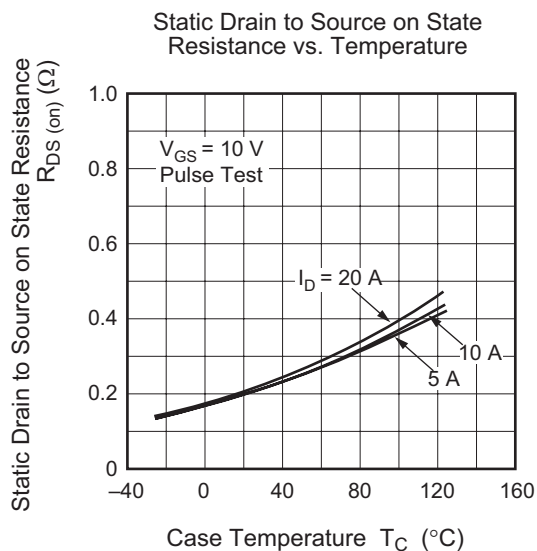


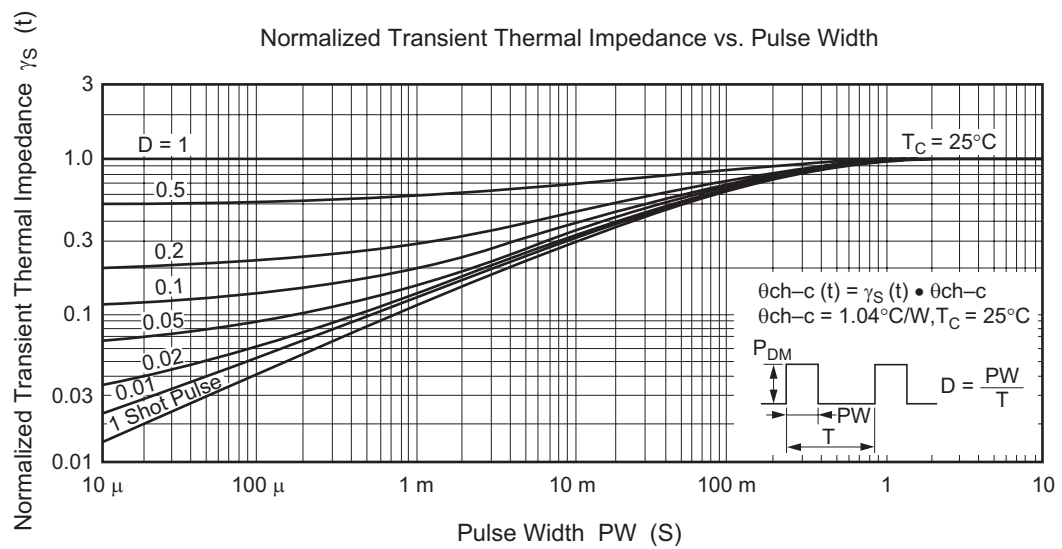
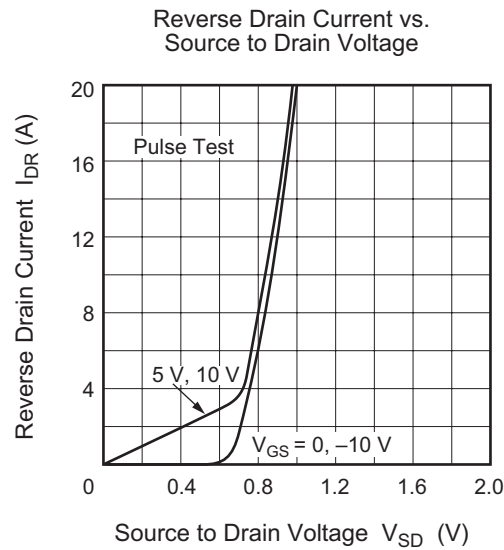
Drain to Source Saturation Voltage vs. Gate to Source Voltage



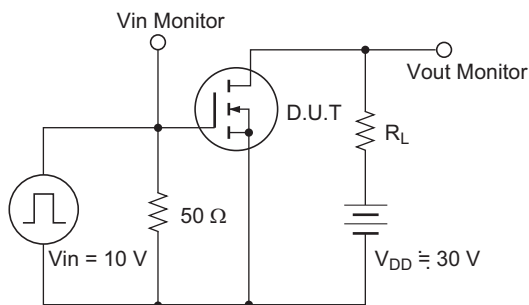
Static Drain to Source on State Resistance vs. Drain Current



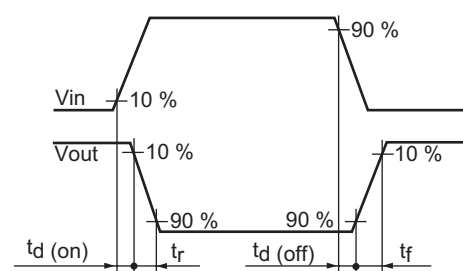




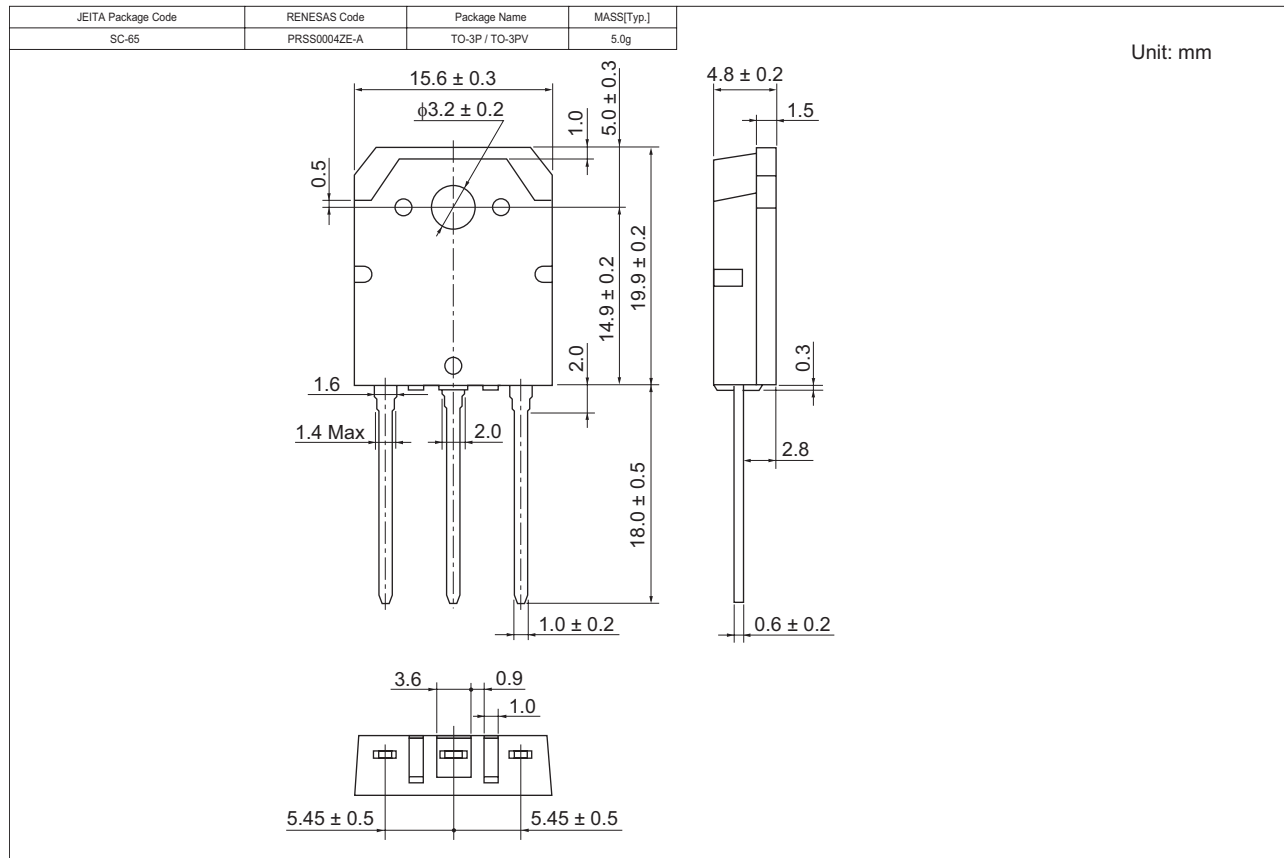
Switching Time Test Circuit



Waveforms



## Package Dimensions



## Ordering Information

Part Name	Quantity	Shipping Container
2SK1169-E	360 pcs	Box (Tube)
2SK1170-E	360 pcs	Box (Tube)

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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