

# 2SK3177

## Silicon N Channel MOS FET High Speed Power Switching

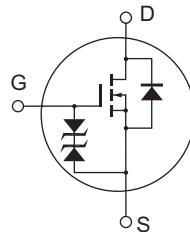
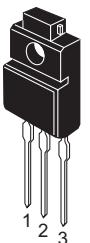
REJ03G1089-0300  
(Previous: ADE-208-745A)  
Rev.3.00  
Sep 07, 2005

### Features

- Low on-resistance  
 $R_{DS} = 90\text{m}\Omega$  typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

### Outline

RENESAS Package code: PRSS0003AD-A  
(Package name: TO-220FM)



1. Gate
2. Drain
3. Source

**Absolute Maximum Ratings**

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V <sub>DSS</sub>	200	V
Gate to source voltage	V <sub>GSS</sub>	±20	V
Drain current	I <sub>D</sub>	15	A
Drain peak current	I <sub>D(pulse)</sub> <sup>Note1</sup>	60	A
Body-drain diode reverse drain current	I <sub>DR</sub>	15	A
Avalanche current	I <sub>AP</sub> <sup>Note3</sup>	15	A
Avalanche energy	E <sub>AR</sub> <sup>Note3</sup>	15	mJ
Channel dissipation	P <sub>ch</sub> <sup>Note2</sup>	35	W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1 %

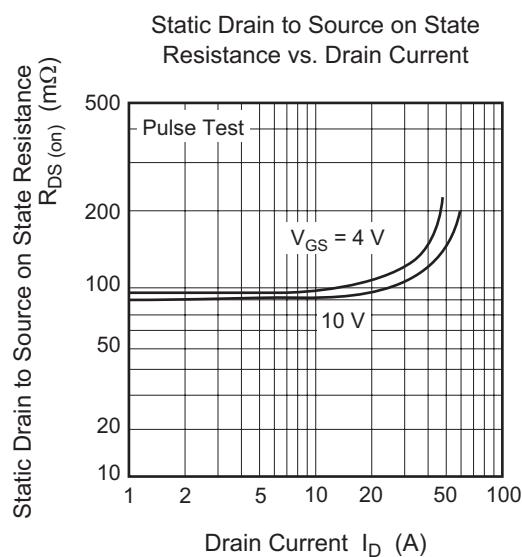
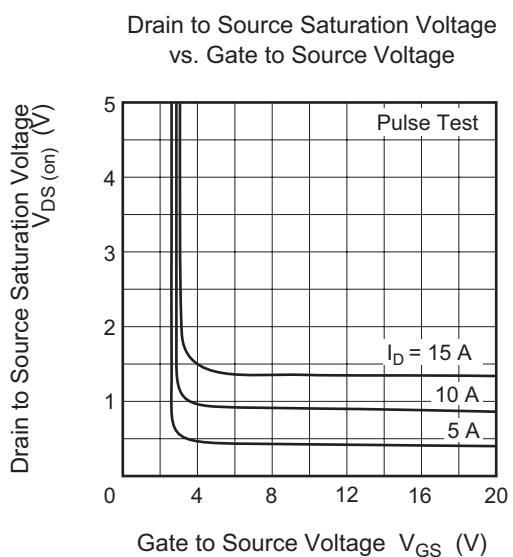
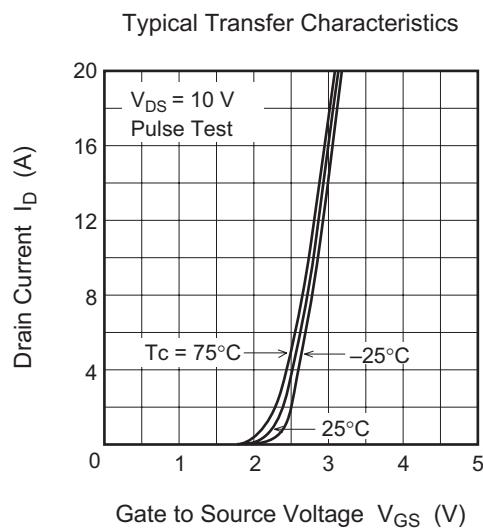
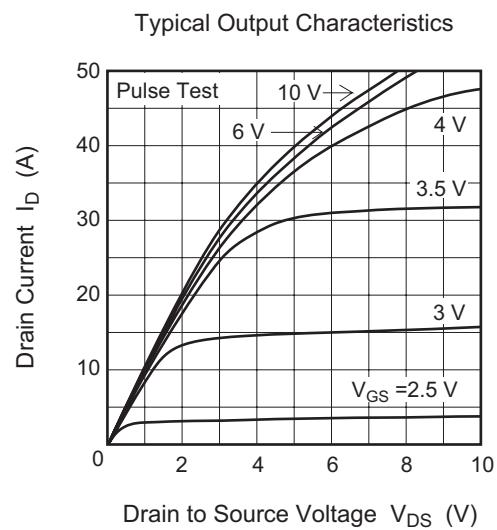
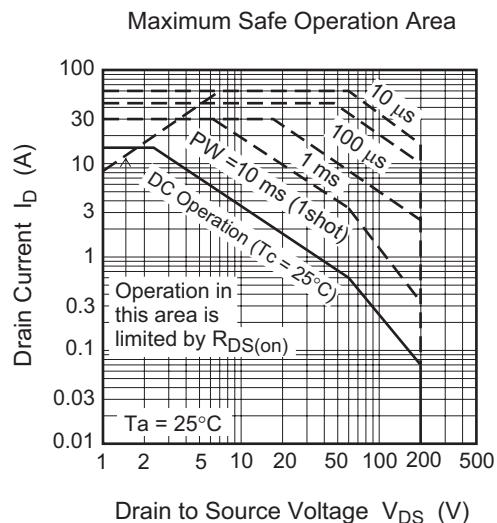
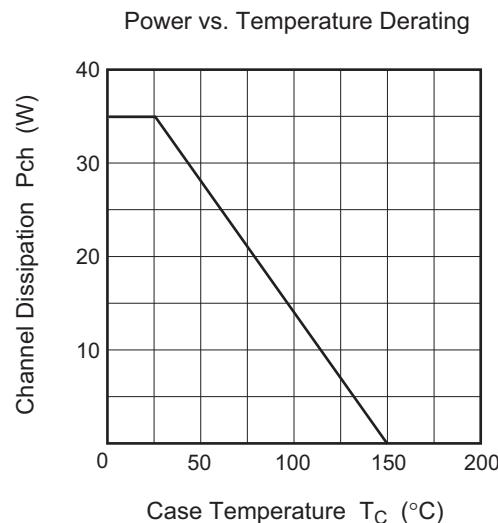
2. Value at T<sub>c</sub> = 25°C3. Value at T<sub>ch</sub> = 25°C, R<sub>g</sub> ≥ 50 Ω**Electrical Characteristics**

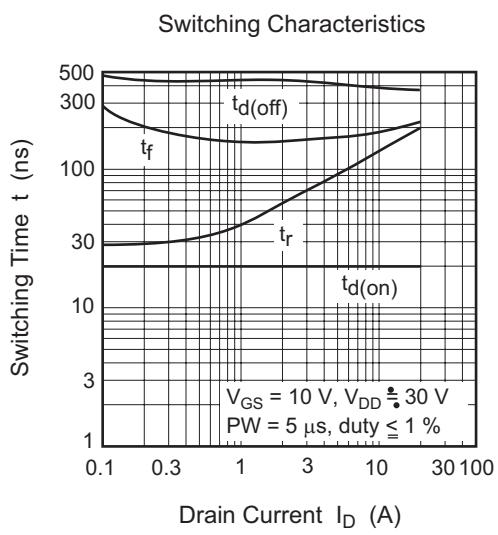
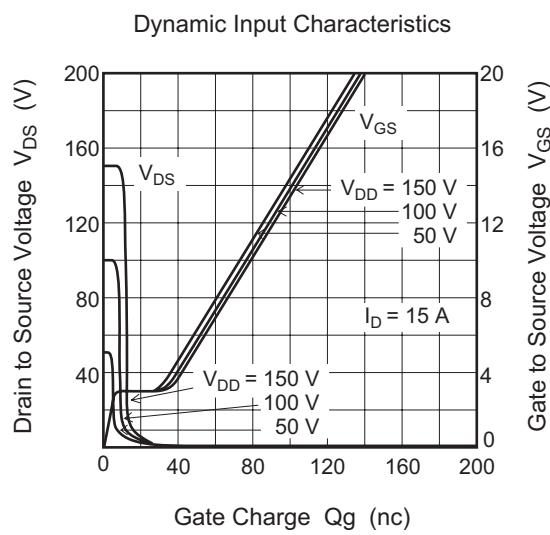
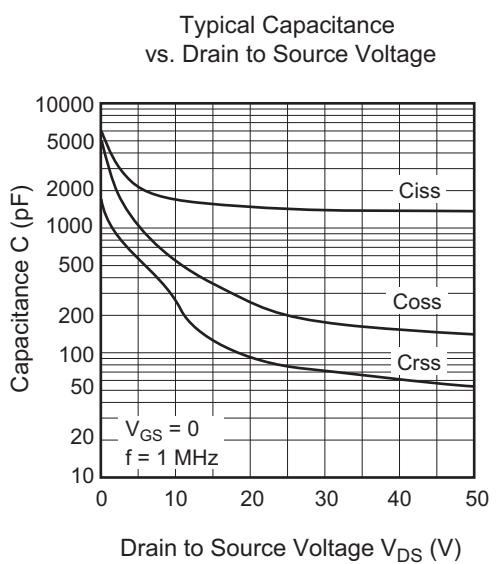
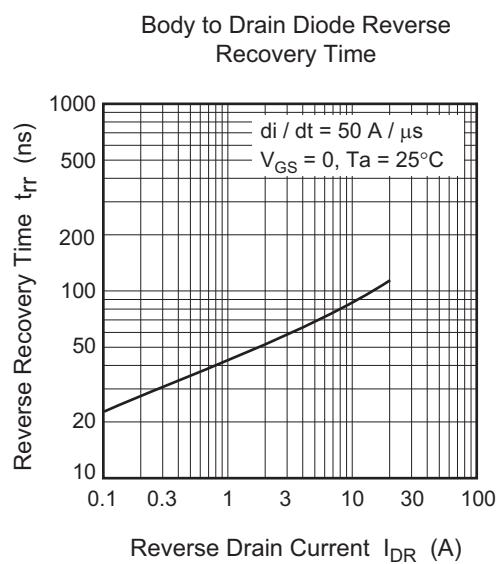
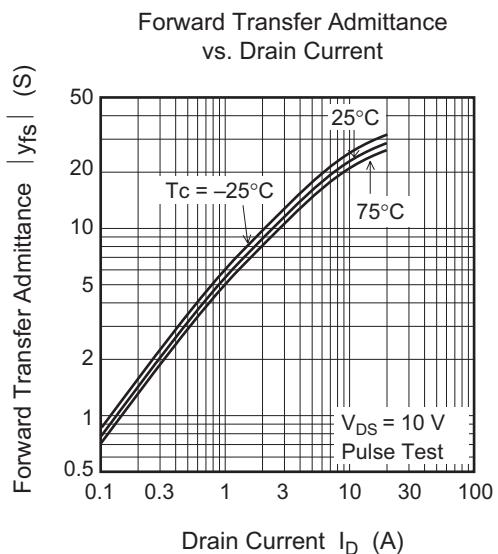
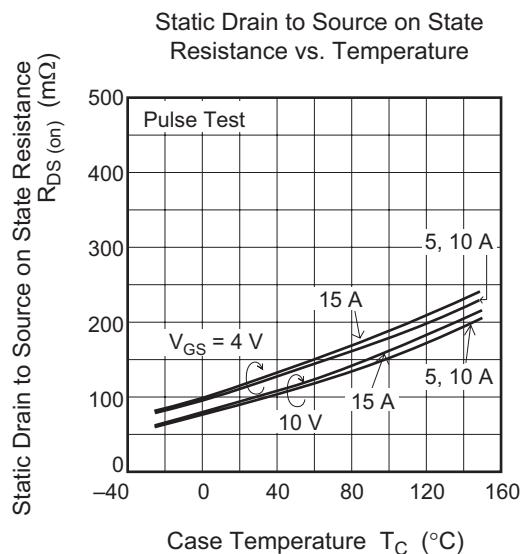
(Ta = 25°C)

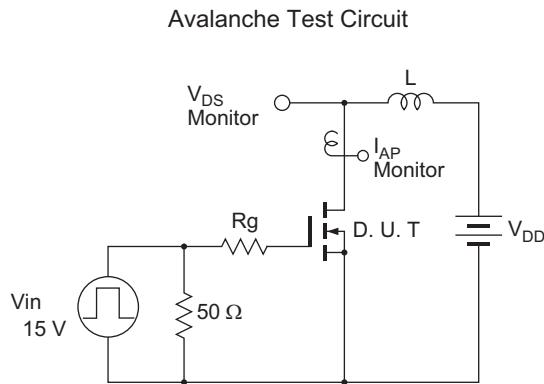
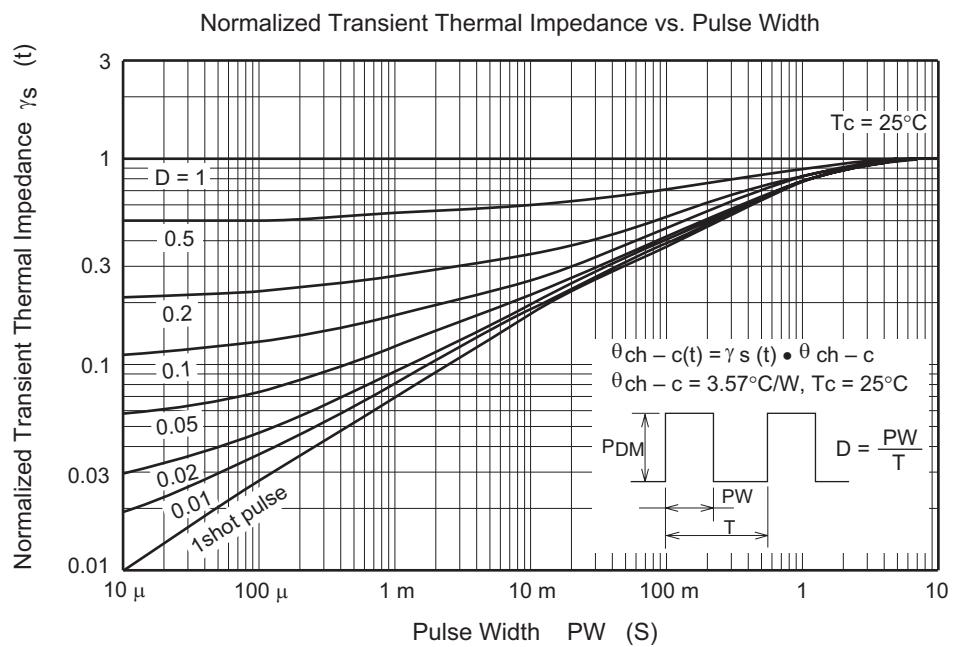
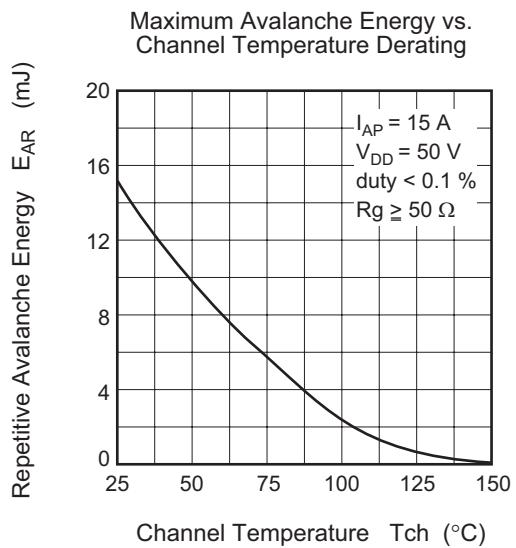
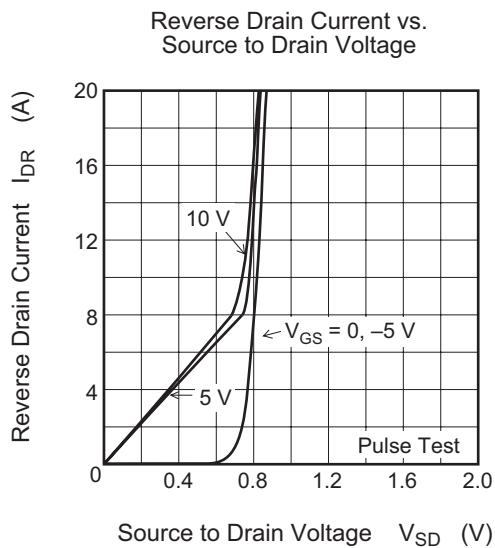
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V <sub>(BR)DSS</sub>	200	—	—	V	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0
Gate to source breakdown voltage	V <sub>(BR)GSS</sub>	±20	—	—	V	I <sub>G</sub> = ±100 µA, V <sub>DS</sub> = 0
Gate to source leak current	I <sub>GSS</sub>	—	—	±10	µA	V <sub>GS</sub> = ±16 V, V <sub>DS</sub> = 0
Zero gate voltage drain current	I <sub>DSS</sub>	—	—	10	µA	V <sub>DS</sub> = 200 V, V <sub>GS</sub> = 0
Gate to source cutoff voltage	V <sub>GS(off)</sub>	1.0	—	2.5	V	I <sub>D</sub> = 1 mA, V <sub>DS</sub> = 10 V
Static drain to source on state resistance	R <sub>DS(on)</sub>	—	90	115	mΩ	I <sub>D</sub> = 8 A, V <sub>GS</sub> = 10 V <sup>Note4</sup>
	R <sub>DS(on)</sub>	—	95	125	mΩ	I <sub>D</sub> = 8 A, V <sub>GS</sub> = 4 V <sup>Note4</sup>
Forward transfer admittance	y <sub>fs</sub>	16	20	—	S	I <sub>D</sub> = 8 A, V <sub>DS</sub> = 10 V <sup>Note4</sup>
Input capacitance	C <sub>iss</sub>	—	1600	—	pF	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0,
Output capacitance	C <sub>oss</sub>	—	510	—	pF	f = 1 MHz
Reverse transfer capacitance	C <sub>rss</sub>	—	250	—	pF	
Turn-on delay time	t <sub>d(on)</sub>	—	20	—	ns	I <sub>D</sub> = 8 A, V <sub>GS</sub> = 10 V, R <sub>L</sub> = 3.75 Ω
Rise time	t <sub>r</sub>	—	120	—	ns	
Turn-off delay time	t <sub>d(off)</sub>	—	400	—	ns	
Fall time	t <sub>f</sub>	—	170	—	ns	
Body-drain diode forward voltage	V <sub>DF</sub>	—	0.85	—	V	I <sub>F</sub> = 15 A, V <sub>GS</sub> = 0
Body-drain diode reverse recovery time	t <sub>rr</sub>	—	100	—	ns	I <sub>F</sub> = 15 A, V <sub>GS</sub> = 0 di <sub>F</sub> /dt = 50 A/µs

Note: 4. Pulse test

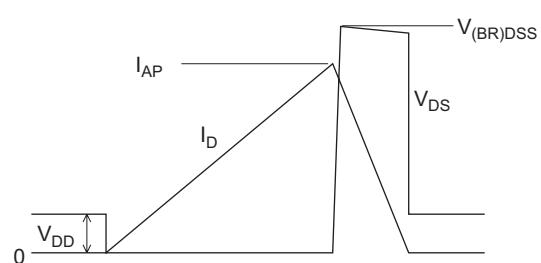
## Main Characteristics

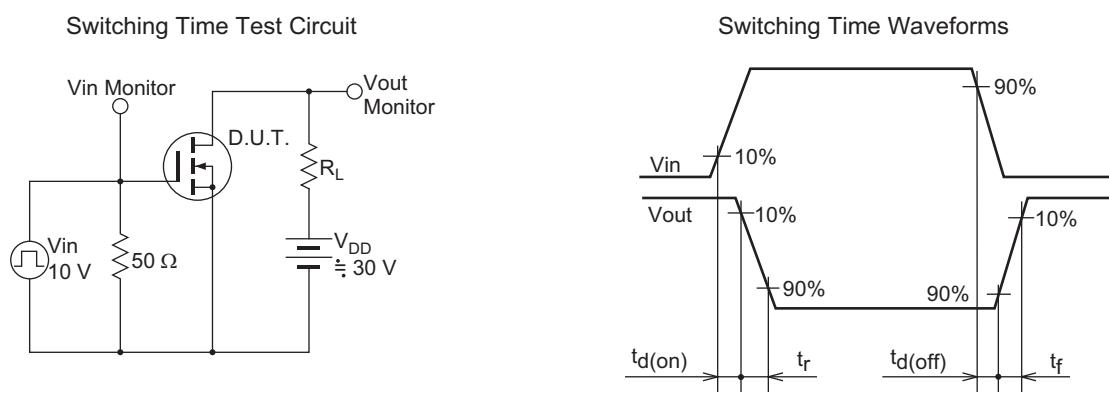






$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$





## Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS(Typ.)	Unit: mm
SC-67	PRSS0003AD-A	TO-220FM / TO-220FMV	1.8g	

## Ordering Information

Part Name	Quantity	Shipping Container
2SK3177-E	500 pcs	Box (Sack)

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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