To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

Cautions

Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.
   Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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2SK1862, 2SK1863

Silicon N-Channel MOS FET

ADE-208-1329 (Z)
1st. Edition
Mar. 2001

Application

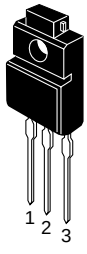
High speed power switching

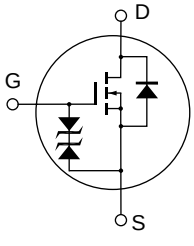
Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for Switching regulator

Outline

TO-220FM





1. Gate
2. Drain
3. Source

Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1862	V_{DSS}	450	V
	2SK1863	V_{DSS}	500	
Gate to source voltage		V_{GSS}	±30	V
Drain current		I_D	3	A
Drain peak current		$I_{D(pulse)}$*[1]	12	A
Body to drain diode reverse drain current		I_{DR}	3	A
Channel dissipation		Pch*[2]	25	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	–55 to +150	°C

Notes 1. PW ≤ 10 µs, duty cycle ≤ 1 %
2. Value at Tc = 25 °C

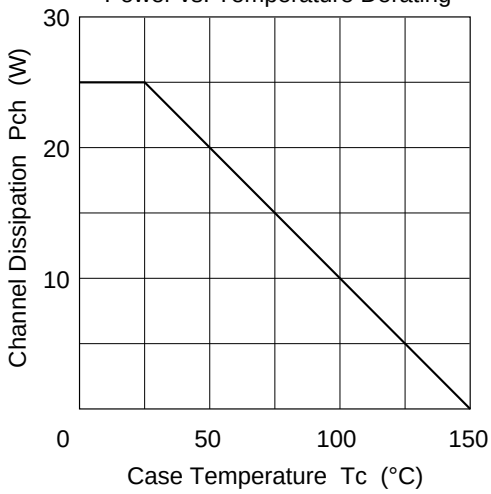
Electrical Characteristics (Ta = 25°C)

Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1862	$V_{(BR)DSS}$	450	—	—	V	I_D = 10 mA, V_{GS} = 0
	2SK1863		500				
Gate to source breakdown voltage		$V_{(BR)GSS}$	±30	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current		I_{GSS}	—	—	±10	µA	V_{GS} = ±25 V, V_{DS} = 0
Zero gate voltage drain current	2SK1862	I_{DSS}	—	—	250	µA	V_{DS} = 360 V, V_{GS} = 0
	2SK1863						V_{DS} = 400 V, V_{GS} = 0
Gate to source cutoff voltage		$V_{GS(off)}$	2.0	—	3.0	V	I_D = 1 mA, V_{DS} = 10 V
Static drain to source on state resistance	2SK1862	$R_{DS(on)}$	—	2.0	2.8	Ω	I_D = 2 A, V_{GS} = 10 V*[1]
	2SK1863		—	2.2	3.0		
Forward transfer admittance		$\|y_{fs}\|$	1.5	2.5	—	S	I_D = 2 A V_{DS} = 10 V*[1]
Input capacitance		Ciss	—	330	—	pF	V_{DS} = 10 V
Output capacitance		Coss	—	90	—	pF	V_{GS} = 0
Reverse transfer capacitance		Crss	—	15	—	pF	f = 1 MHz
Turn-on delay time		$t_{d(on)}$	—	7	—	ns	I_D = 2 A
Rise time		t_r	—	20	—	ns	V_{GS} = 10 V
Turn-off delay time		$t_{d(off)}$	—	30	—	ns	R_L = 15 Ω
Fall time		t_f	—	20	—	ns	
Body to drain diode forward voltage		V_{DF}	—	0.9	—	V	I_F = 3 A, V_{GS} = 0
Body to drain diode reverse recovery time		t_{rr}	—	300	—	ns	I_F = 3 A, V_{GS} = 0, di_F / dt = 100 A / µs

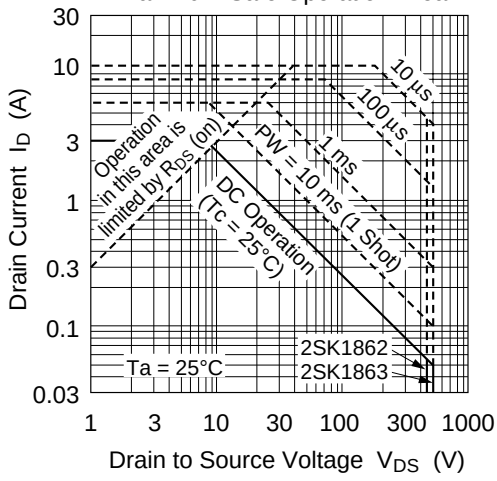
Note 1. Pulse Test

See characteristic curves of 2SK1153, 2SK1154

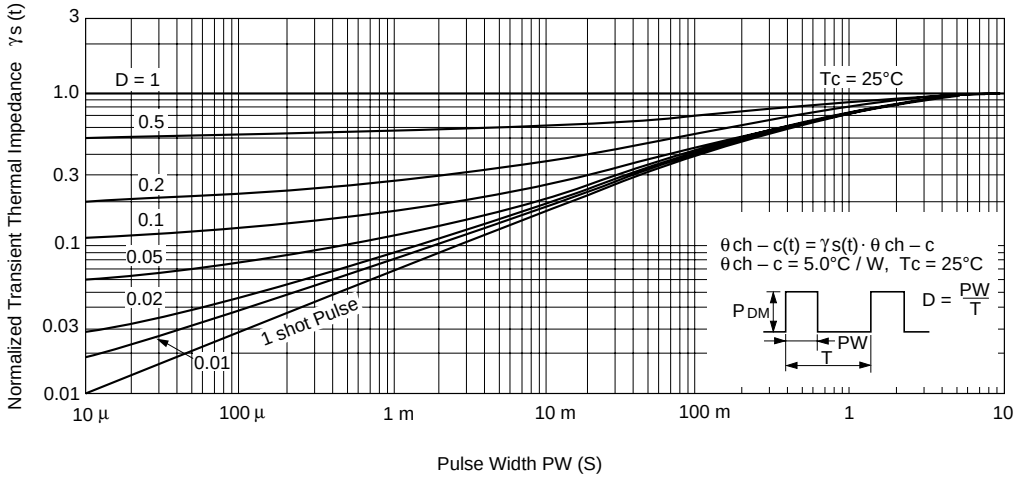
Power vs. Temperature Derating



Maximum Safe Operation Area



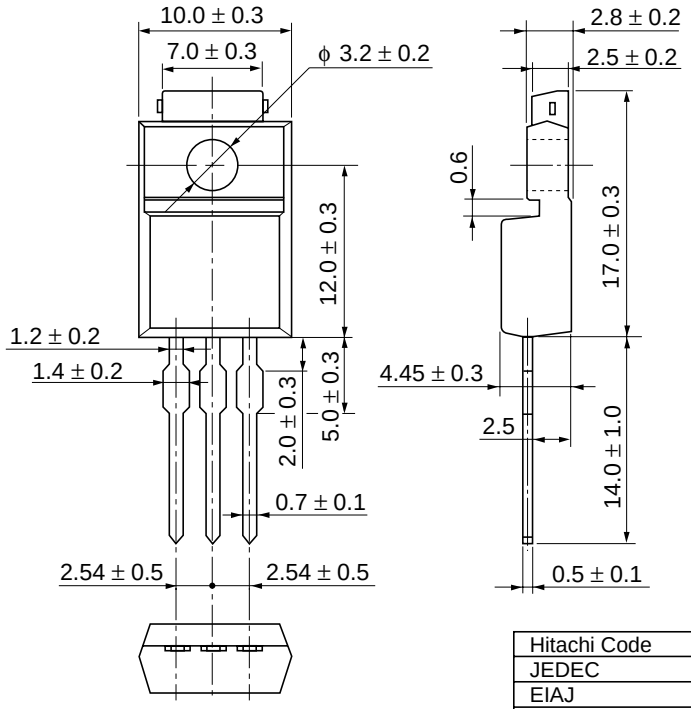
Normalized Transient Thermal Impedance vs. Pulse Width

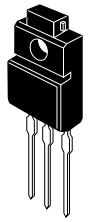


Package Dimensions

As of January, 2001

Unit: mm





Hitachi Code	TO-220FM
JEDEC	—
EIAJ	Conforms
Mass (reference value)	1.8 g

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