

2SK2978

Silicon N Channel MOS FET
High Speed Power Switching

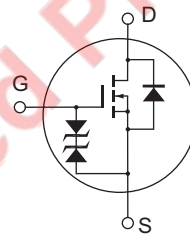
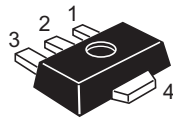
REJ03G1060-0500
(Previous: ADE-208-659C)
Rev.5.00
Sep.07,2005

Features

- Low on-resistance
 $R_{DS(on)} = 0.09 \Omega$ typ. ($V_{GS} = 4 \text{ V}$, $I_D = 1.5 \text{ A}$)
- Low drive current
- High speed switching
- 2.5 V gate drive devices.

Outline

RENESAS Package code: PLZZ0004CA-A
(Package name: UPAK[®])



1. Gate
2. Drain
3. Source
4. Drain

Note: Marking is "ZY"

*UPAK is a trademark of Renesas Technology Corp.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DS}	20	V
Gate to source voltage	V_{GS}	± 10	V
Drain current	I_D	2.5	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	5	A
Body-drain diode reverse drain current	I_{DR}	2.5	A
Channel dissipation	P_{ch} ^{Note2}	1	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. When using the alumina ceramic board (12.5 x 20 x 0.7 mm)

Electrical Characteristics

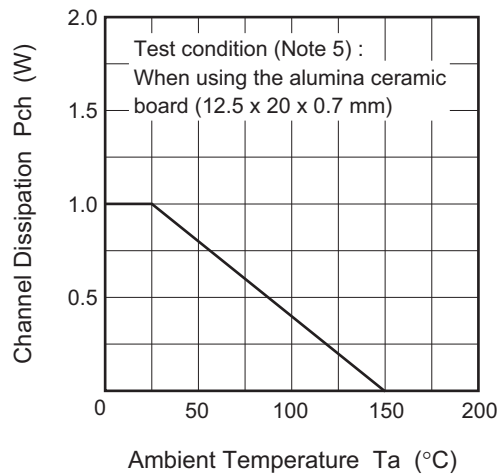
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	20	—	—	V	$I_D = 10\text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 10	—	—	V	$I_G = \pm 100\text{ }\mu\text{A}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 20\text{ V}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 8\text{ V}$, $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.5	—	1.5	V	$I_D = 1\text{ mA}$, $V_{DS} = 10\text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.09	0.12	Ω	$I_D = 1.5\text{ A}$, $V_{GS} = 4\text{ V}$ ^{Note3}
Static drain to source on state resistance	$R_{DS(on)}$	—	0.12	0.20	Ω	$I_D = 1.5\text{ A}$, $V_{GS} = 2.5\text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	3.0	5.0	—	S	$I_D = 1.5\text{ A}$, $V_{DS} = 10\text{ V}$ ^{Note3}
Input capacitance	C_{iss}	—	260	—	pF	$V_{DS} = 10\text{ V}$, $V_{GS} = 0$, $f = 1\text{ MHz}$
Output capacitance	C_{oss}	—	150	—	pF	
Reverse transfer capacitance	C_{rss}	—	75	—	pF	
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$V_{GS} = 4\text{ V}$, $I_D = 1.5\text{ A}$, $R_L = 6.67\text{ }\Omega$
Rise time	t_r	—	70	—	ns	
Turn-off delay time	$t_{d(off)}$	—	55	—	ns	
Fall time	t_f	—	70	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.9	—	V	$I_F = 2.5\text{ A}$, $V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	75	—	ns	$I_F = 2.5\text{ A}$, $V_{GS} = 0$ $di_F/dt = 50\text{ A}/\mu s$

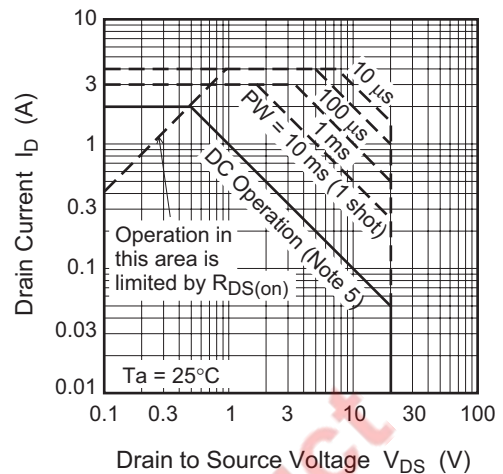
Note: 3. Pulse test

Main Characteristics

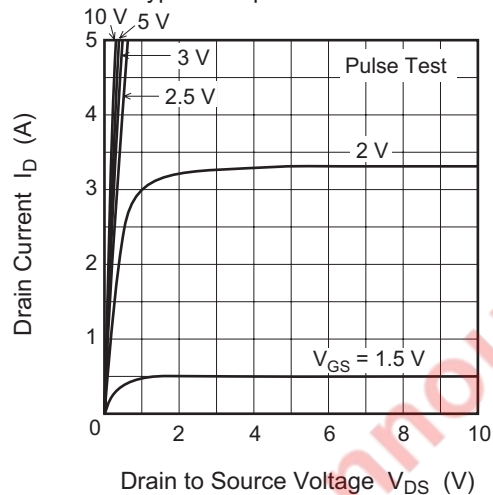
Power vs. Temperature Derating



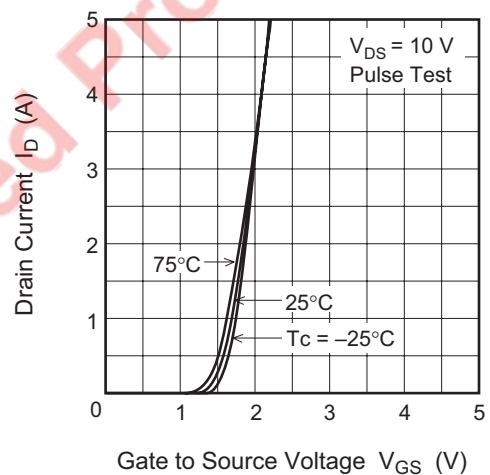
Maximum Safe Operation Area



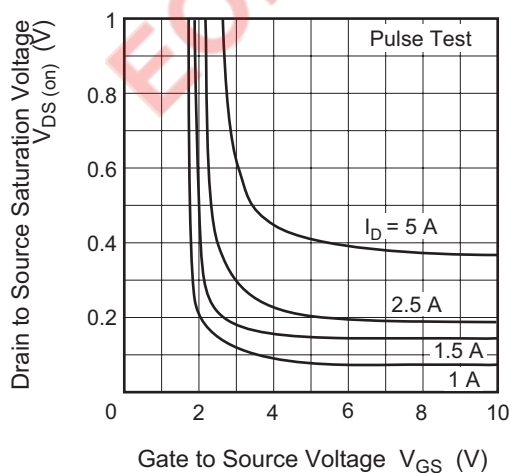
Typical Output Characteristics



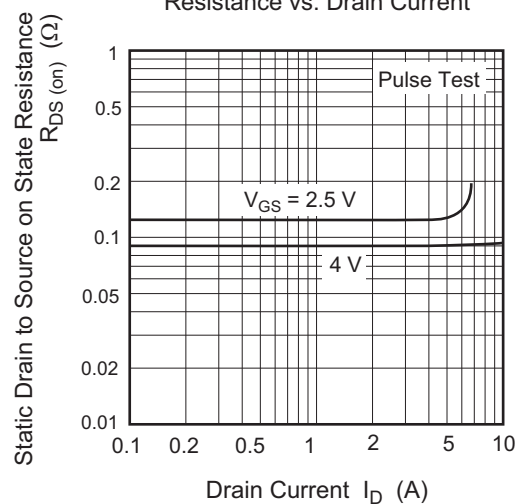
Typical Transfer Characteristics

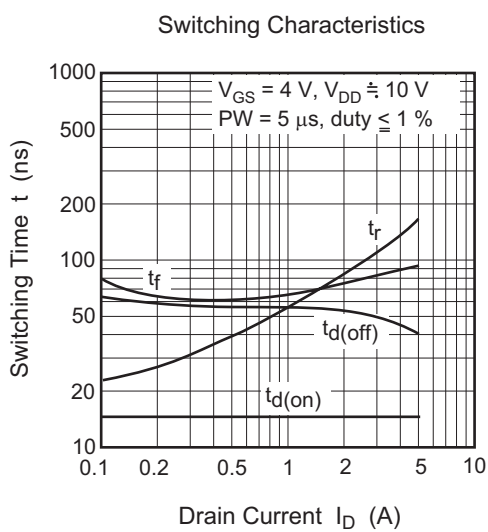
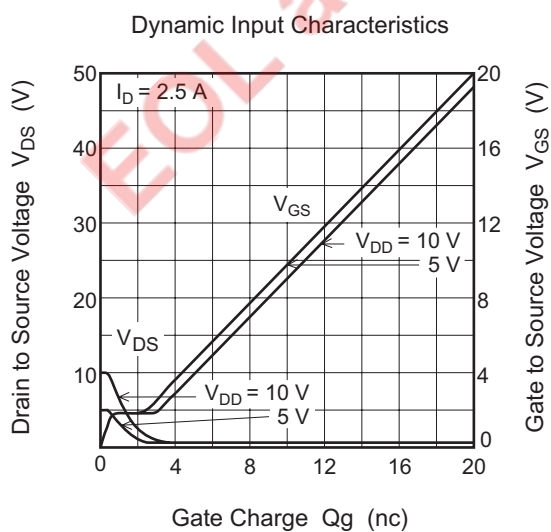
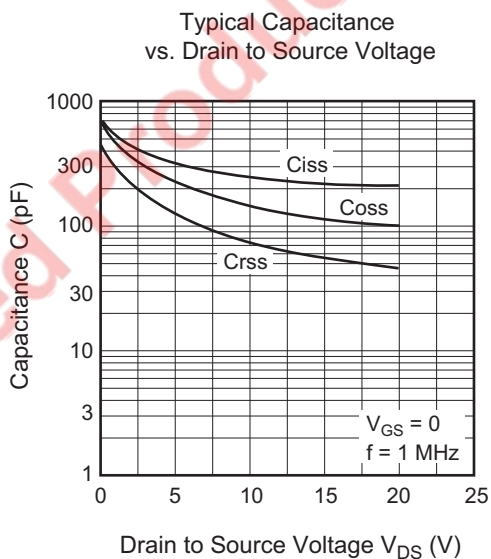
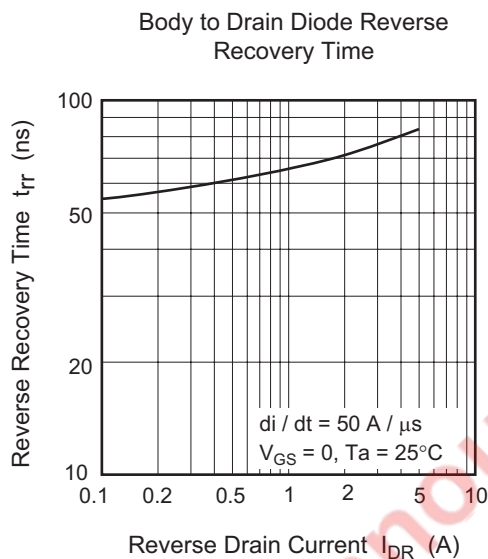
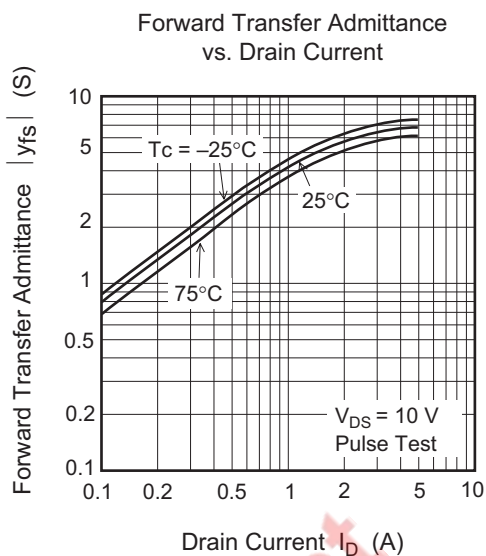
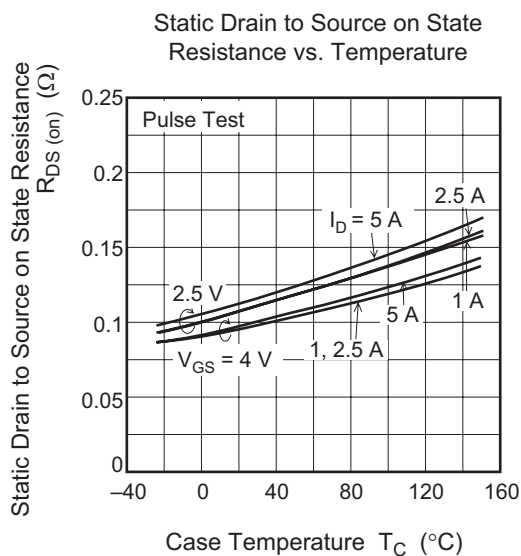


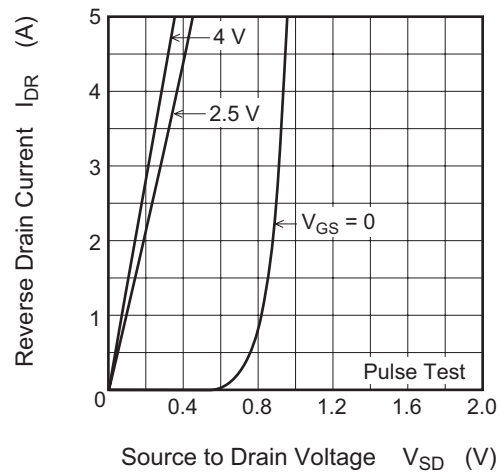
Drain to Source Saturation Voltage vs. Gate to Source Voltage



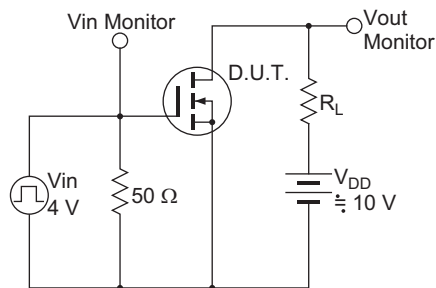
Static Drain to Source on State Resistance vs. Drain Current



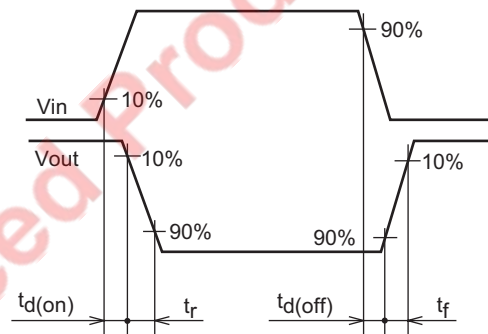


Reverse Drain Current vs.
Source to Drain Voltage

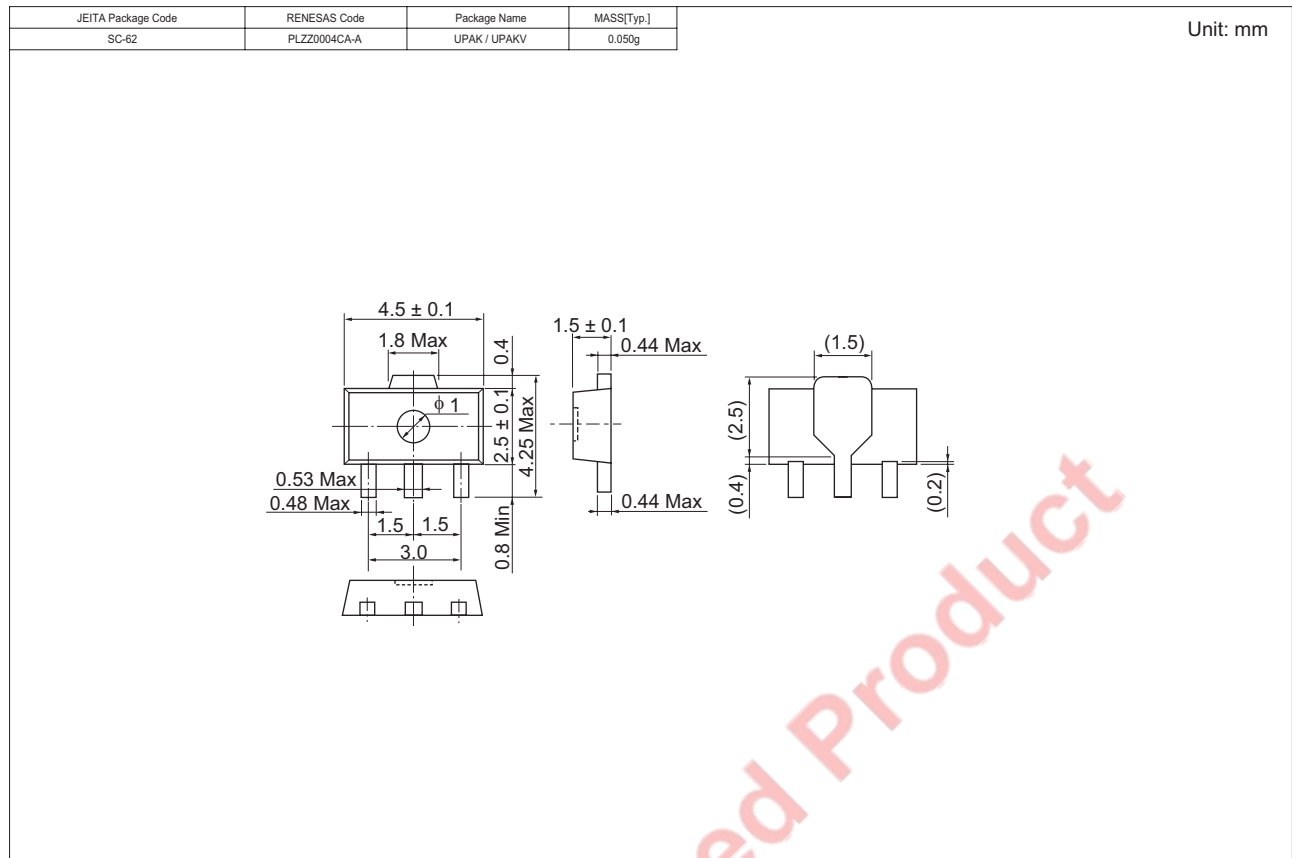
Switching Time Test Circuit



Waveform



Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
2SK2978ZYTLE	1000 pcs	Taping
2SK2978ZYTR-E	1000 pcs	Taping

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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