

2SK2788

Silicon N Channel MOS FET High Speed Power Switching

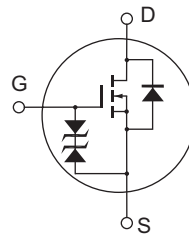
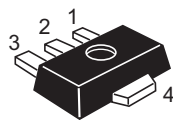
REJ03G1033-0200
(Previous: ADE-208-538)
Rev.2.00
Sep.07,2005

Features

- Low on-resistance
 $R_{DS(on)} = 0.12 \Omega$ typ ($V_{GS} = 10 \text{ V}$, $I_D = 1 \text{ A}$)
- Low drive current
- High speed switching
- 4 V gate drive devices.

Outline

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



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

Note: Marking is "VY"

*UPAK is a trademark of Renesas Technology Corp.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DS}	60	V
Gate to source voltage	V_{GS}	± 20	V
Drain current	I_D	2	A
Drain peak current	$I_{D(pulse)}^{*1}$	4	A
Body to drain diode reverse drain current	I_{DR}	2	A
Channel dissipation	P_{ch}^{*2}	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

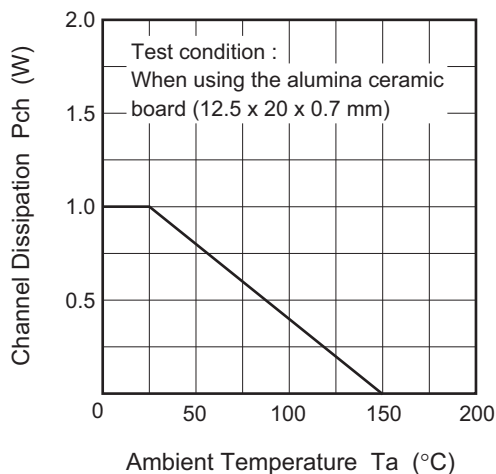
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \mu A$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 60 \text{ V}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.12	0.16	Ω	$I_D = 1 \text{ A}$, $V_{GS} = 10 \text{ V}^{*3}$
	$R_{DS(on)}$	—	0.16	0.25	Ω	$I_D = 1 \text{ A}$, $V_{GS} = 4 \text{ V}^{*3}$
Forward transfer admittance	$ y_{fs} $	1.6	2.8	—	S	$I_D = 1 \text{ A}$, $V_{DS} = 10 \text{ V}^{*3}$
Input capacitance	C_{iss}	—	180	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	90	—	pF	
Reverse transfer capacitance	C_{rss}	—	30	—	pF	
Turn-on delay time	$t_{d(on)}$	—	9	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 1 \text{ A}$, $R_L = 30 \Omega$
Rise time	t_r	—	15	—	ns	
Turn-off delay time	$t_{d(off)}$	—	40	—	ns	
Fall time	t_f	—	35	—	ns	
Body to drain diode forward voltage	V_{DF}	—	0.9	—	V	$I_D = 2 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	35	—	ns	$I_F = 2 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 50 \text{ A}/\mu s$

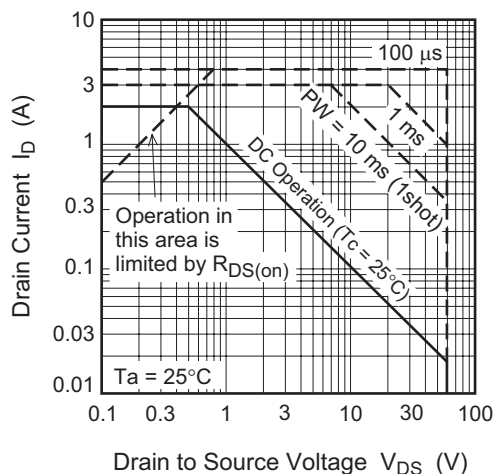
Notes: 3. Pulse test

Main Characteristics

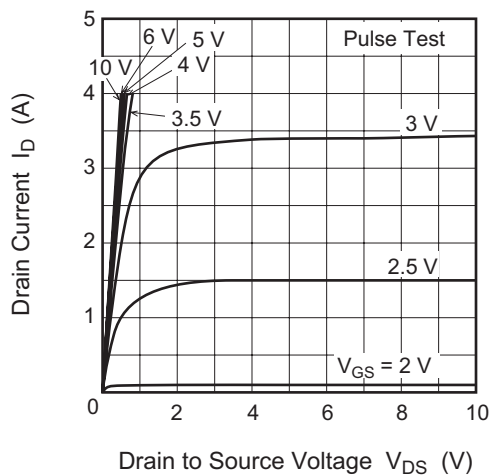
Power vs. Temperature Derating



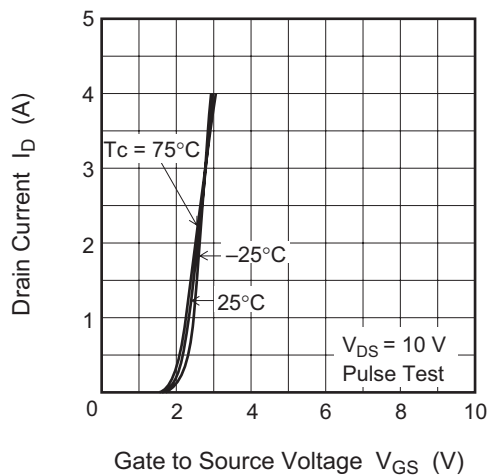
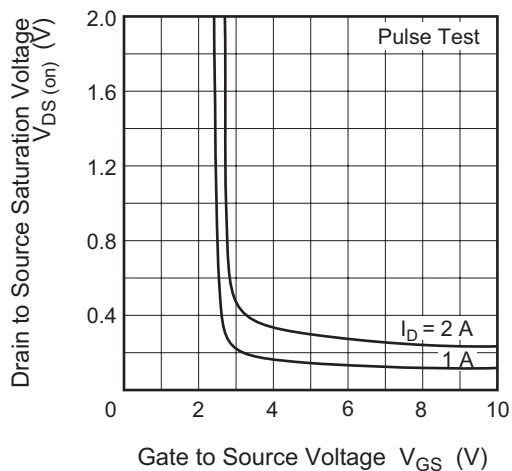
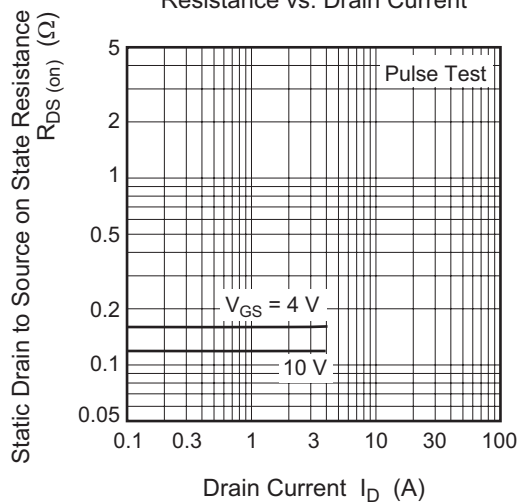
Maximum Safe Operation Area



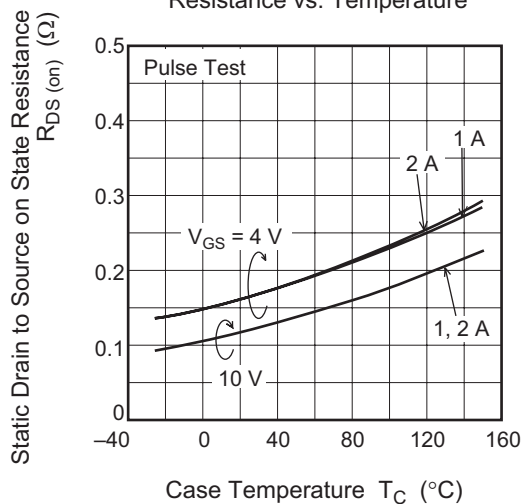
Typical Output Characteristics



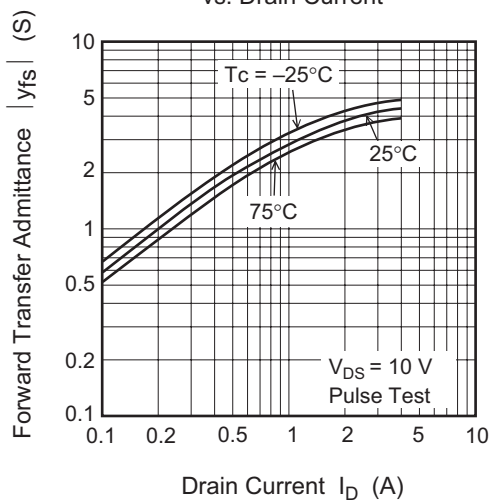
Typical Transfer Characteristics

Drain to Source Saturation Voltage
vs. Gate to Source VoltageStatic Drain to Source on State
Resistance vs. Drain Current

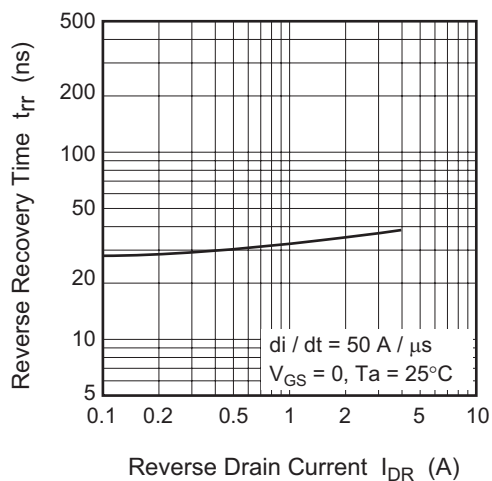
Static Drain to Source on State Resistance vs. Temperature



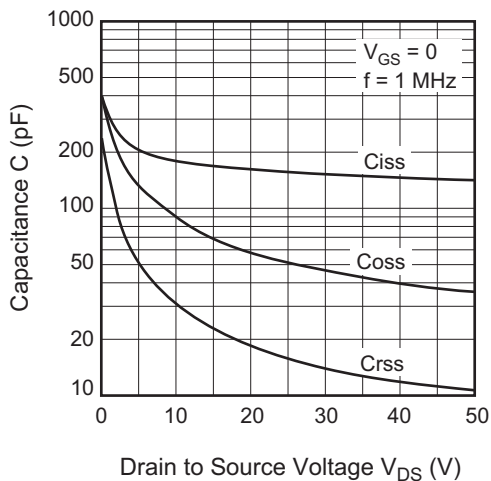
Forward Transfer Admittance vs. Drain Current



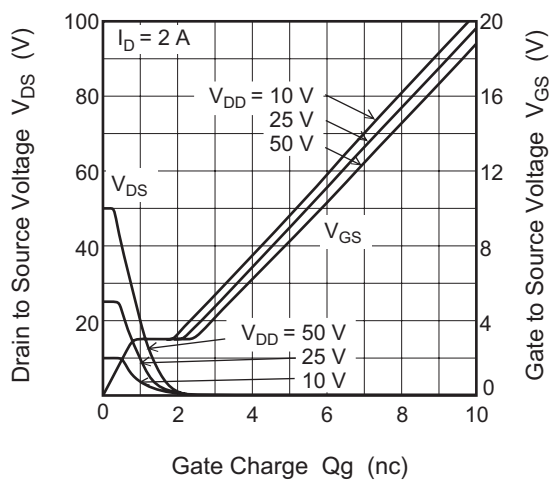
Body to Drain Diode Reverse Recovery Time



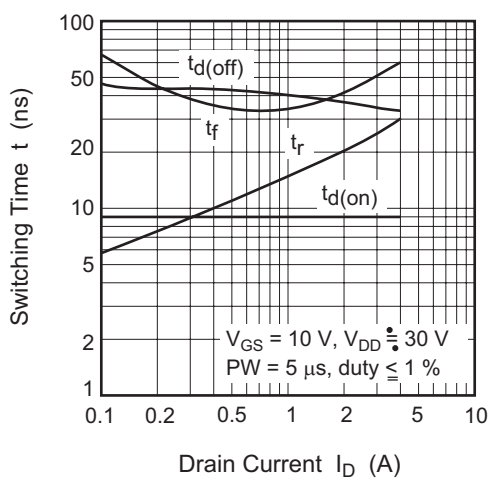
Typical Capacitance vs. Drain to Source Voltage

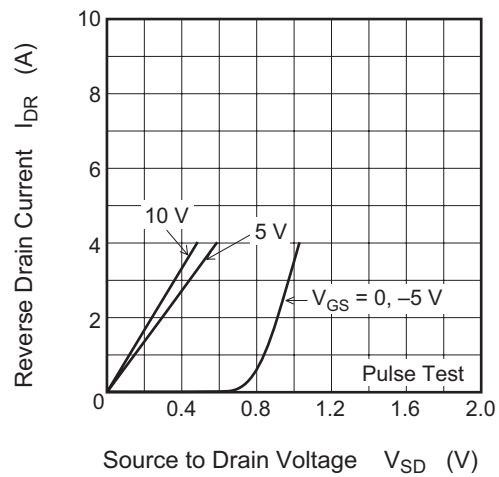


Dynamic Input Characteristics

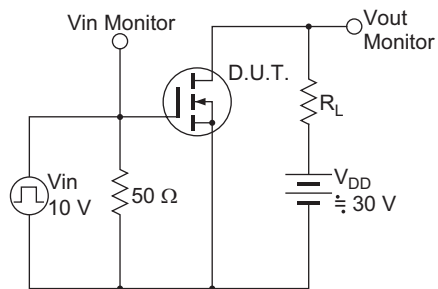


Switching Characteristics

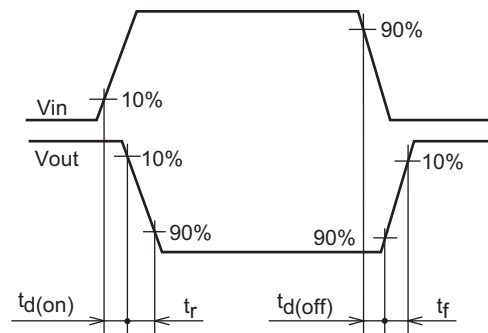


Reverse Drain Current vs.
Source to Drain Voltage

Switching Time Test Circuit



Waveform



Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]	Unit: mm
SC-62	PLZZ0004CA-A	UPAK / UPAKV	0.050g	

The drawing shows three views of the package: a top view, a side view, and an end view. The top view shows a rectangular package with a central circular feature of diameter $\phi 1$. Dimensions include a total width of 4.5 ± 0.1 mm, a maximum width of 1.8 mm, a height of 0.4 mm, a maximum height of 2.5 ± 0.1 mm, a maximum height of 4.25 mm, a minimum height of 0.8 mm, and a maximum height of 0.53 mm. The side view shows a maximum width of 1.5 ± 0.1 mm, a maximum width of 0.44 mm, and a maximum width of 0.44 mm. The end view shows a maximum width of 1.5 mm, a maximum width of 0.4 mm, and a maximum width of 0.2 mm.

Ordering Information

Part Name	Quantity	Shipping Container
2SK2788VYTL-E	1000 pcs	Taping
2SK2788VYTR-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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