

2SK3107C

R07DS1286EJ0200

Rev.2.00

Jul 16, 2015

N-CHANNEL MOSFET FOR SWITCHING

Description

The 2SK3107C, N-channel vertical type MOSFET designed for general-purpose switch, is a device which can be driven directly by a 4.5 V power source.

Features

- Directly driven by a 4.5 V power source.
- Low on-state resistance
 - $R_{DS(on)1} = 2.7 \Omega$ MAX. ($V_{GS} = 10$ V, $I_D = 100$ mA)
 - $R_{DS(on)2} = 3.2 \Omega$ MAX. ($V_{GS} = 4.5$ V, $I_D = 50$ mA)

Ordering Information

Part Number	Lead Plating	Packing	Package
2SK3107C-T1-A/AT	-A:Sn-Bi , -AT:Pure Sn	3000p/Reel	SC-75 (3pUSM)

Remark "-A/AT" indicates Pb-free. This product does not contain Pb in external electrode and other parts.

Marking XP

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$)

Drain to Source Voltage ($V_{GS} = 0$ V)	V_{DSS}	60	V
Gate to Source Voltage ($V_{DS} = 0$ V)	V_{GSS}	± 20	V
Drain Current (DC)	$I_{D(DC)}$	± 200	mA
Drain Current (pulse) ^{Note1}	$I_{D(pulse)}$	± 800	mA
Total Power Dissipation ^{Note2}	P_T	200	mW
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Note 1. $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

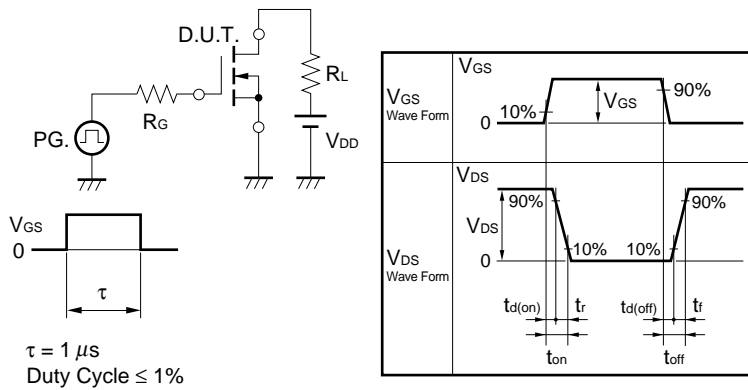
Note 2. Mounted on ceramic substrate of 3.0 cm \times 0.64 mm

Electrical Characteristics (TA = 25°C)

Characteristics	Symbol	Test Conditions	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$			1	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$			± 10	μA
Gate to Source Cut-off Voltage	$V_{GS(off)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.0		2.5	V
Forward Transfer Admittance Note	$ y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 100\text{ mA}$	150			mS
Drain to Source On-state Resistance Note	$R_{DS(on)1}$	$V_{GS} = 10\text{ V}, I_D = 100\text{ mA}$		2.1	2.7	Ω
	$R_{DS(on)2}$	$V_{GS} = 4.5\text{ V}, I_D = 50\text{ mA}$		2.4	3.2	Ω
Input Capacitance	C_{iss}	$V_{DS} = 10\text{ V},$		20		pF
Output Capacitance	C_{oss}	$V_{GS} = 0\text{ V},$		9		pF
Reverse Transfer Capacitance	C_{rss}	$f = 1.0\text{ MHz}$		2		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V},$		16		ns
Rise Time	t_r	$I_D = 200\text{ mA},$		6.5		ns
Turn-off Delay Time	$t_{d(off)}$	$V_{GS} = 10\text{ V},$		82		ns
Fall Time	t_f	$R_G = 10\ \Omega$		32		ns
Total Gate Charge	Q_G	$I_D = 200\text{ mA}, V_{DD} = 25\text{ V}, V_{GS} = 10\text{ V}$		2		nC
Body Diode Forward Voltage Note	$V_{F(S-D)}$	$I_F = 200\text{ mA}, V_{GS} = 0\text{ V}$		0.86		V

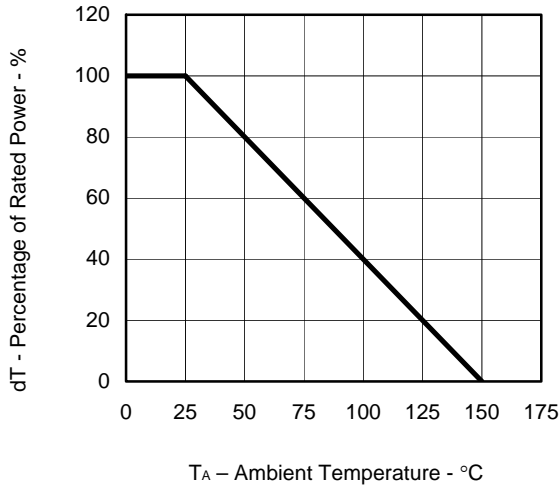
Note Pulsed

Test Circuit Switching Time

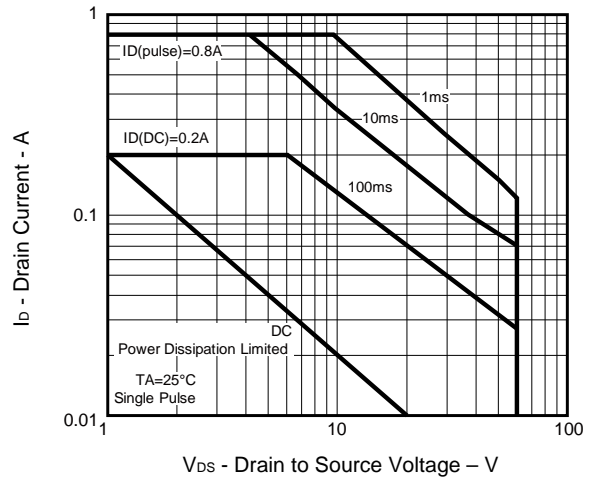


Typical Characteristics (TA = 25°C)

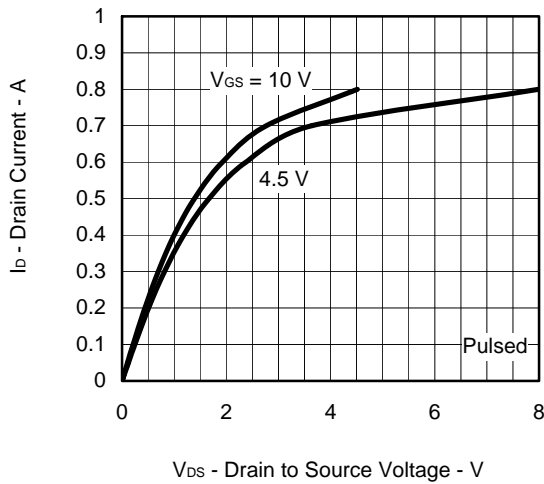
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



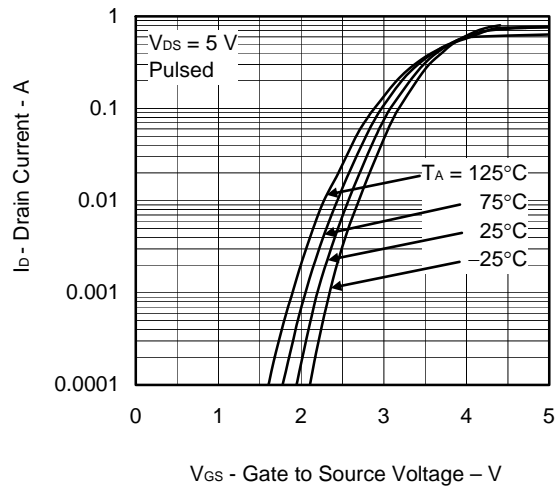
FORWARD BIAS SAFE OPERATING AREA



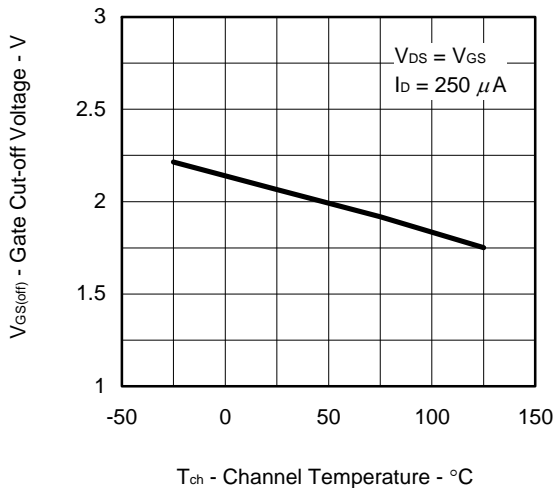
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



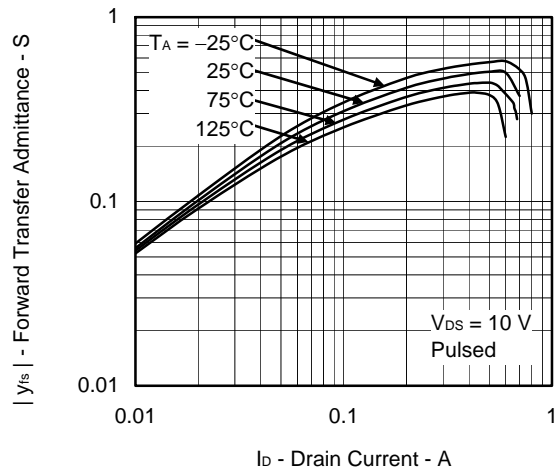
FORWARD TRANSFER CHARACTERISTICS



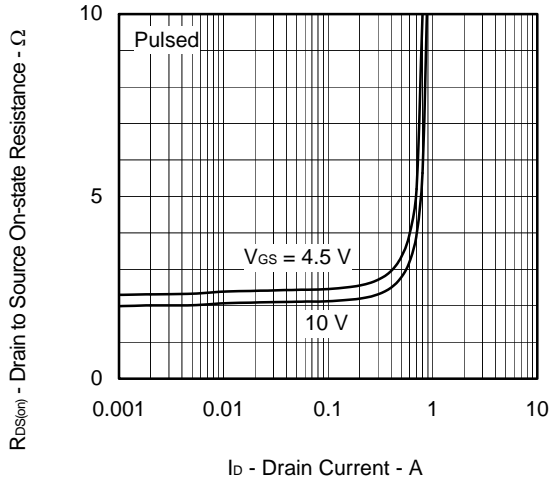
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



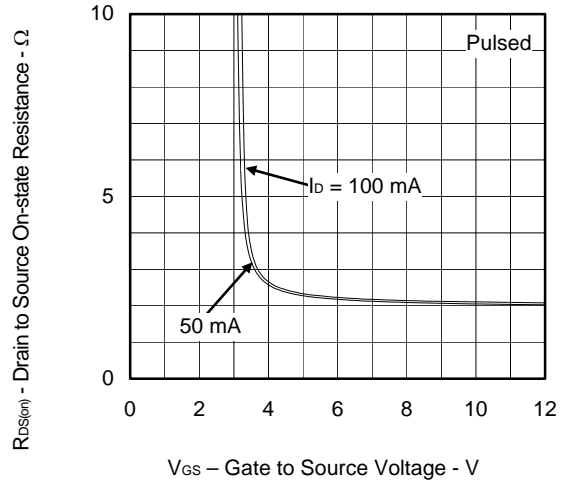
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



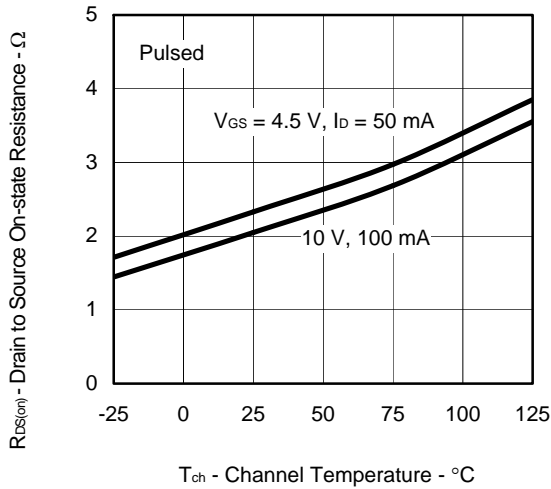
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



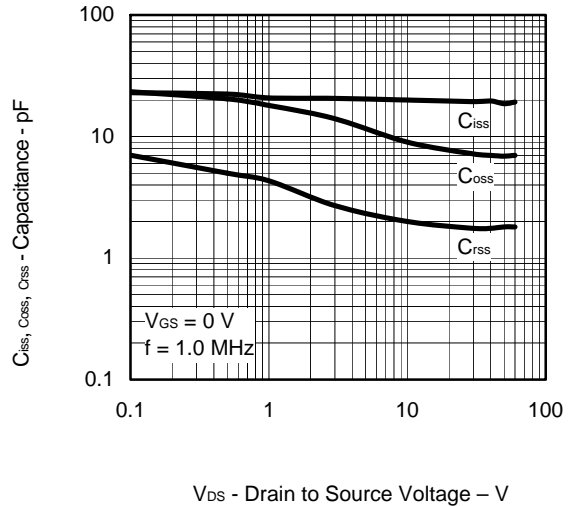
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



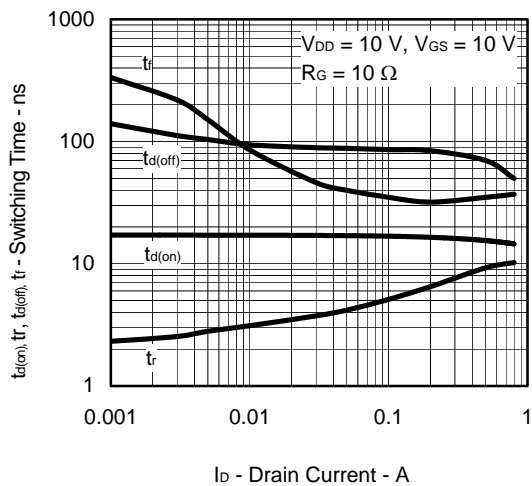
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



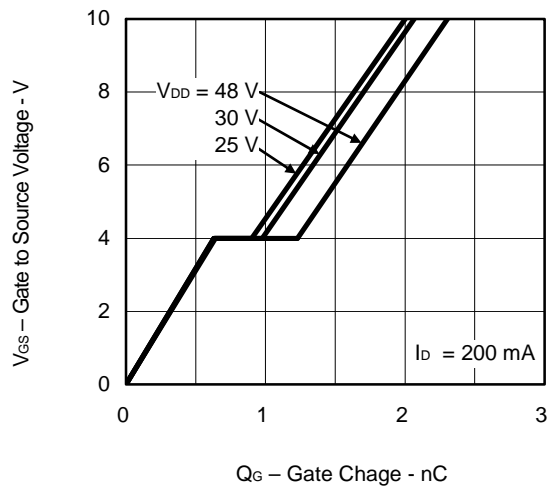
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



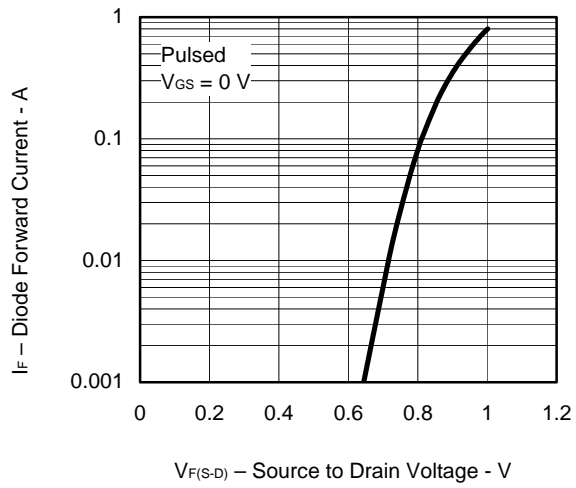
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS

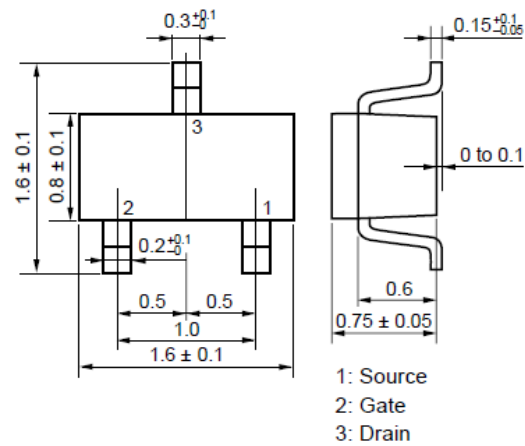


SOURCE TO DRAIN DIODE FORWARD VOLTAGE

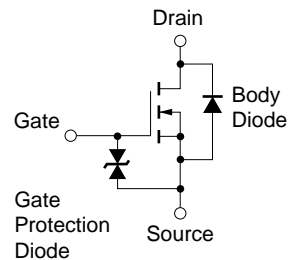


Package Drawings (Unit: mm)

SC-75 (3pUSM)



Equivalent Circuit



Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

	2SK3107C
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Rev.	Date	Description	
		Page	Summary
1.00	Sep , 2013	-	First Edition Issued
2.00	Jun, 2015	2	- Changed Electrical Characteristics - Changed Test Circuit Switching Time
		3, 4, 5	Changed all graphs
		5	Added FORWARD BIAS SAFE OPERATING AREA

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