

2SK3054C

R07DS1285EJ0200

Rev.2.00

N-CHANNEL MOSFET FOR SWITCHING

Jul 16, 2015

Description

The 2SK3054C, 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
 $R_{DS(on)1} = 2.7 \Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 100 \text{ mA)}$
 $R_{DS(on)2} = 3.2 \Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 50 \text{ mA)}$

Ordering Information

| Part Number | Lead Plating | Packing | Package |
|-------------------|------------------------|------------|---------------|
| 2SK3054C-T1B-A/AT | -A:Sn-Bi , -AT:Pure Sn | 3000p/Reel | SC-70 (3pSSP) |

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

Marking XM

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

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

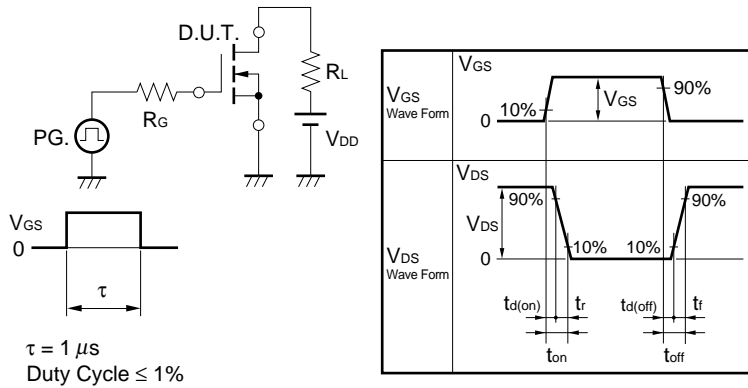
Note $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

Electrical Characteristics (T_A = 25°C)

| Characteristics | Symbol | Test Conditions | MIN. | TYP. | MAX. | UNIT |
|---|----------------------|---|------|------|------|------|
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = 60 V, V _{GS} = 0 V | | | 1 | μA |
| Gate Leakage Current | I _{GSS} | V _{GS} = ±20 V, V _{DS} = 0 V | | | ±10 | μA |
| Gate to Source Cut-off Voltage | V _{GS(off)} | V _{DS} = V _{GS} , I _D = 250 μA | 1.0 | | 2.5 | V |
| Forward Transfer Admittance Note | y _{fs} | V _{DS} = 10 V, I _D = 100 mA | 150 | | | mS |
| Drain to Source On-state Resistance Note | R _{DS(on)1} | V _{GS} = 10 V, I _D = 100 mA | | 2.1 | 2.7 | Ω |
| | R _{DS(on)2} | V _{GS} = 4.5 V, I _D = 50 mA | | 2.4 | 3.2 | Ω |
| Input Capacitance | C _{iss} | V _{DS} = 10 V, | | 20 | | pF |
| Output Capacitance | C _{oss} | V _{GS} = 0 V, | | 9 | | pF |
| Reverse Transfer Capacitance | C _{rss} | f = 1.0 MHz | | 2 | | pF |
| Turn-on Delay Time | t _{d(on)} | V _{DD} = 10 V, | | 16 | | ns |
| Rise Time | t _r | I _D = 200 mA, | | 6.5 | | ns |
| Turn-off Delay Time | t _{d(off)} | V _{GS} = 10 V, | | 82 | | ns |
| Fall Time | t _f | R _G = 10 Ω | | 32 | | ns |
| Total Gate Charge | Q _G | I _D = 200 mA, V _{DD} = 25 V, V _{GS} = 10 V | | 2 | | nC |
| Body Diode Forward Voltage Note | V _{F(S-D)} | I _F = 200 mA, V _{GS} = 0 V | | 0.86 | | V |

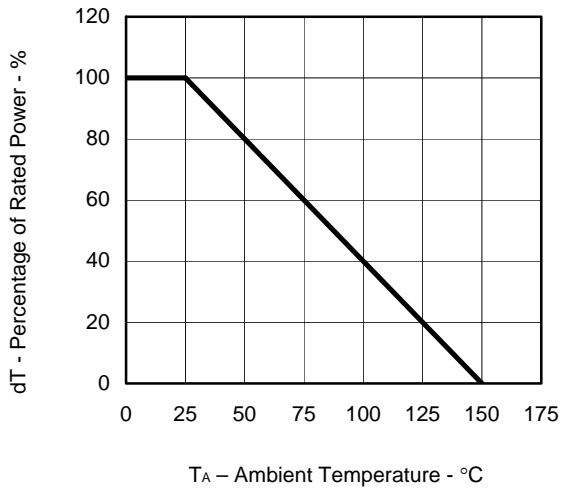
Note Pulsed

Test Circuit Switching Time

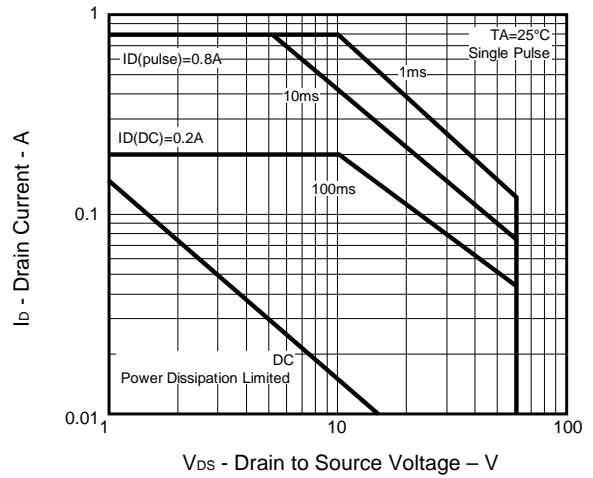


Typical Characteristics (TA = 25°C)

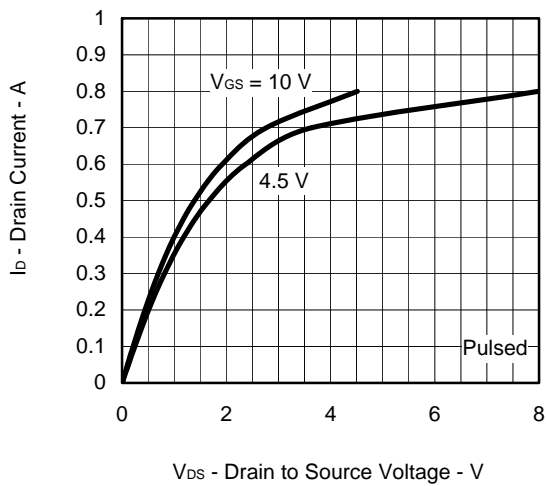
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



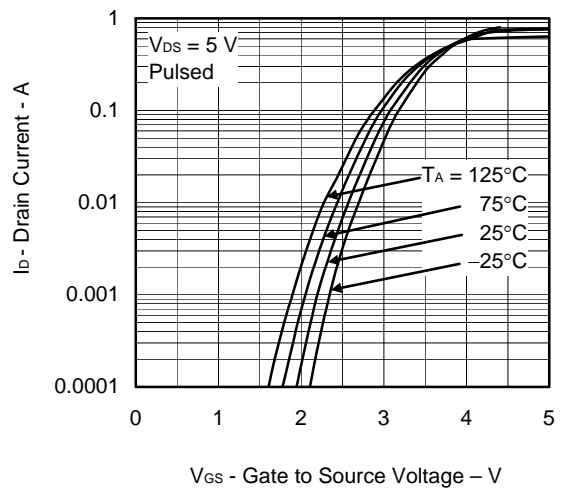
FORWARD BIAS SAFE OPERATING AREA



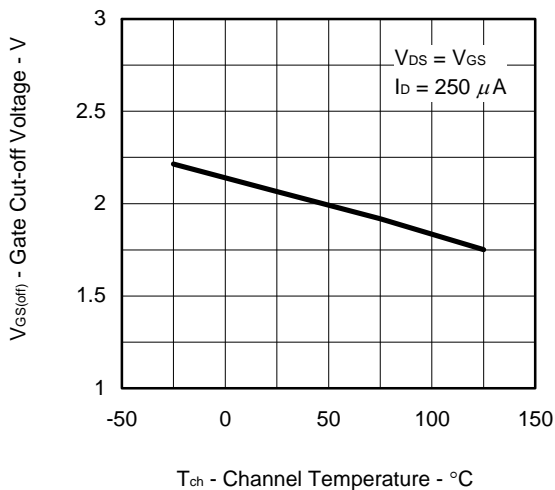
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



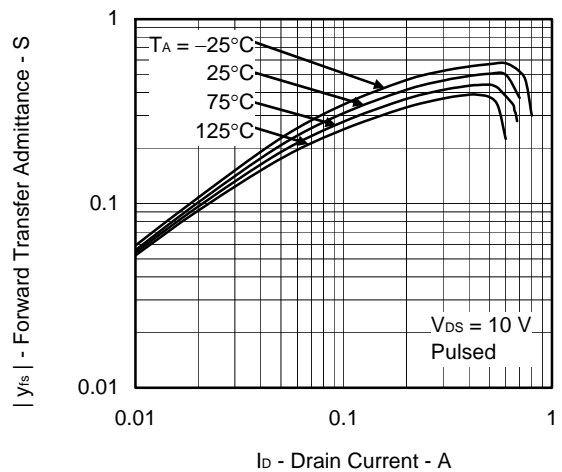
FORWARD TRANSFER CHARACTERISTICS



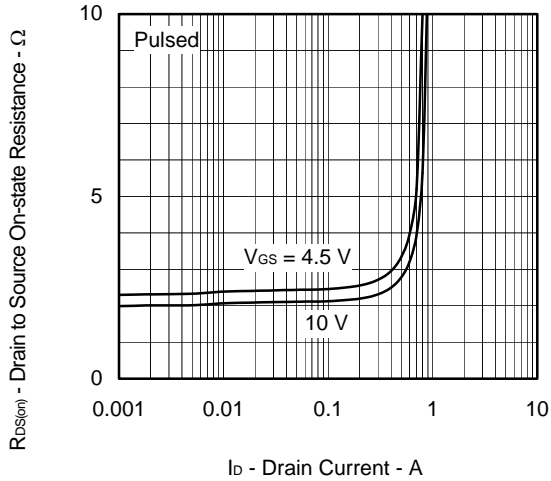
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



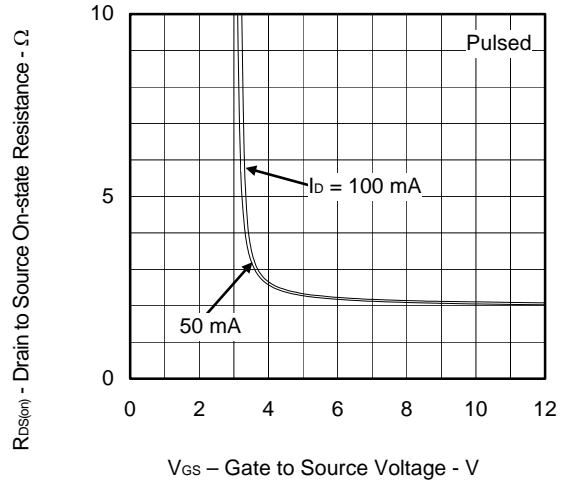
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



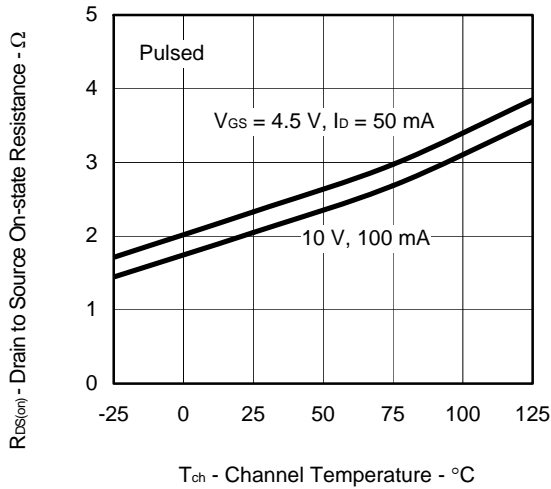
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



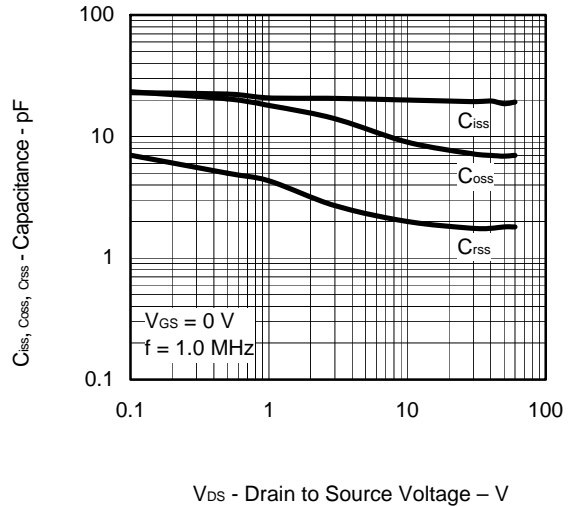
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



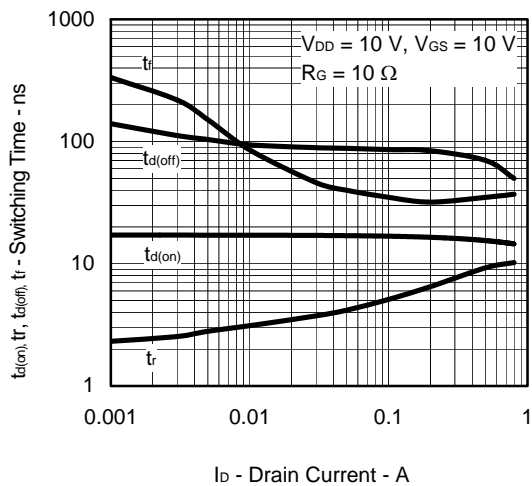
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



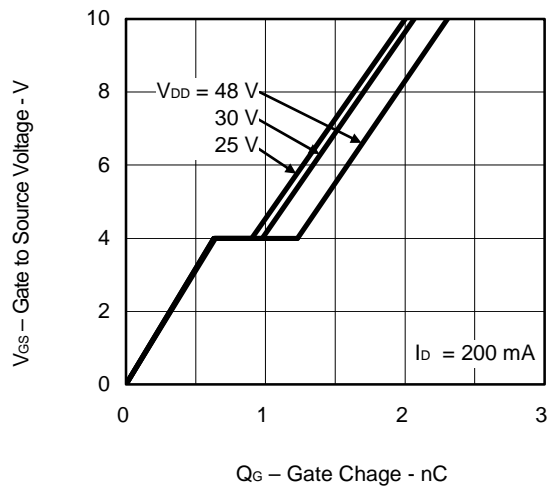
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



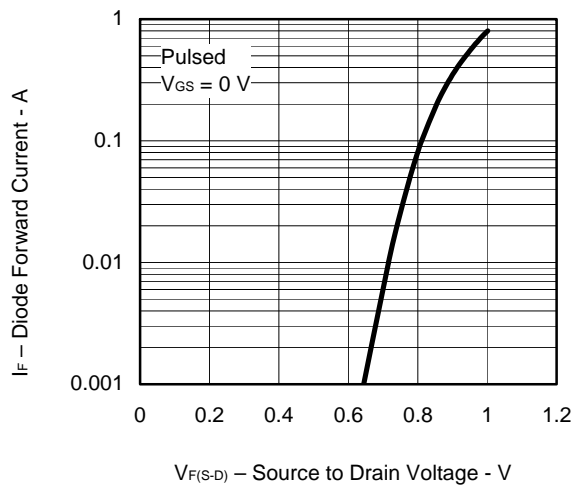
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS

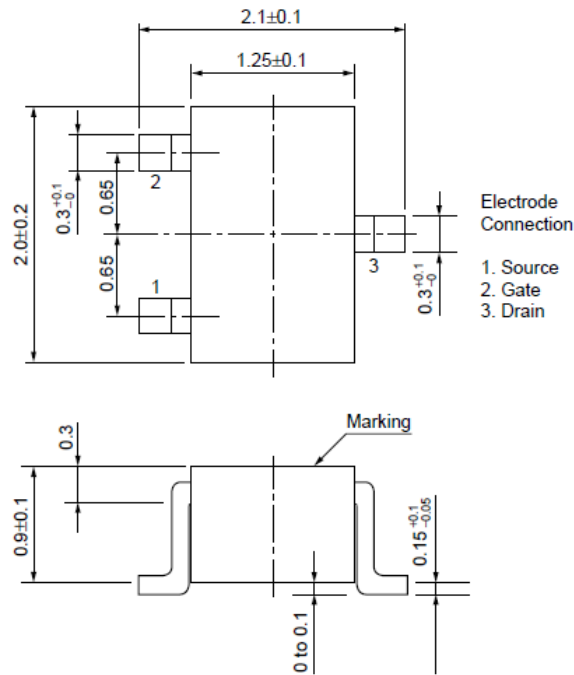


SOURCE TO DRAIN DIODE FORWARD VOLTAGE

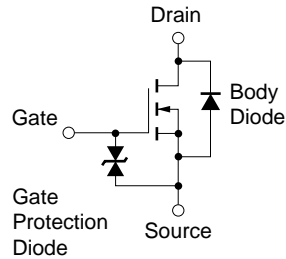


Package Drawings (Unit: mm)

SC-70 (3pSSP)



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.

| | |
|--|-----------------|
| | 2SK3054C |
|--|-----------------|

| 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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