

# 2SK3054C

R07DS1285EJ0300

Rev.3.00

## N-CHANNEL MOSFET FOR SWITCHING

May 30, 2016

### 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-T1-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 ( $V_{DS} = 0 \text{ V}$ )	$V_{GSS}$	$\pm 20$	V
Drain Current (DC)	$I_{D(DC)}$	$\pm 200$	mA
Drain Current (pulse) <sup>Note</sup>	$I_{D(pulse)}$	$\pm 800$	mA
Total Power Dissipation	$P_T$	150	mW
Channel Temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

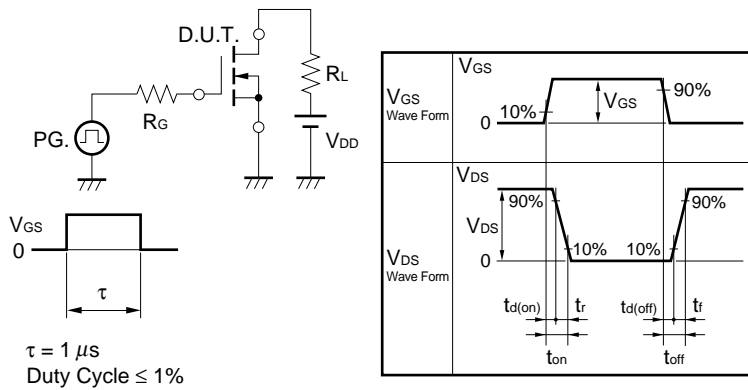
**Note**  $PW \leq 10 \mu\text{s}$ , Duty Cycle  $\leq 1\%$

**Electrical Characteristics (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	$\mu\text{A}$
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$			$\pm 10$	$\mu\text{A}$
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 <b>Note</b>	$ y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 100\text{ mA}$	150			mS
Drain to Source On-state Resistance <b>Note</b>	$R_{DS(on)1}$	$V_{GS} = 10\text{ V}, I_D = 100\text{ mA}$		2.1	2.7	$\Omega$
	$R_{DS(on)2}$	$V_{GS} = 4.5\text{ V}, I_D = 50\text{ mA}$		2.4	3.2	$\Omega$
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 <b>Note</b>	$V_{F(S-D)}$	$I_F = 200\text{ mA}, V_{GS} = 0\text{ V}$		0.86		V

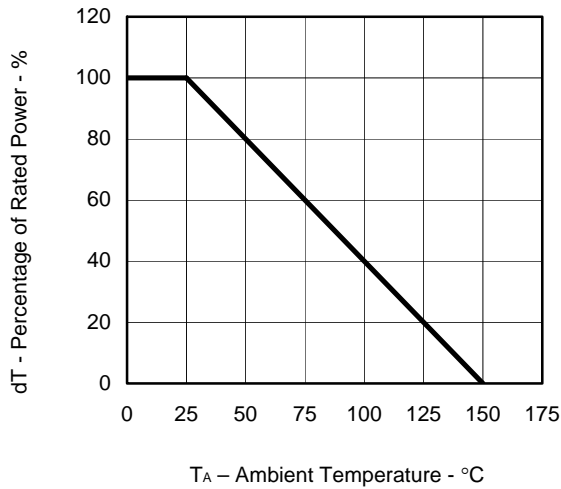
**Note** Pulsed

**Test Circuit Switching Time**

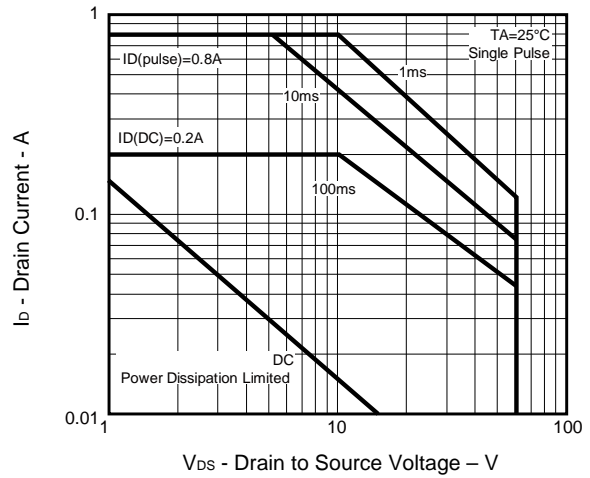


Typical Characteristics (TA = 25°C)

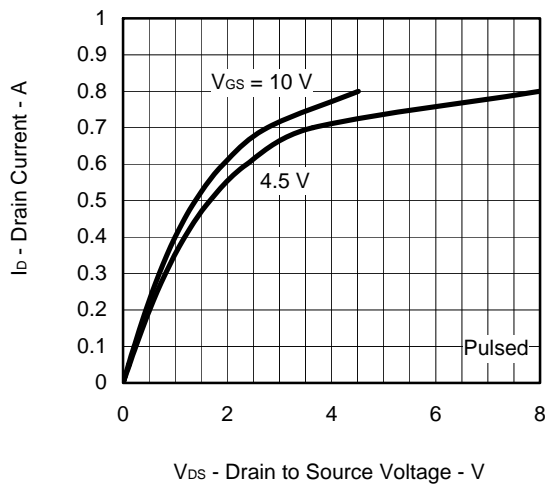
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



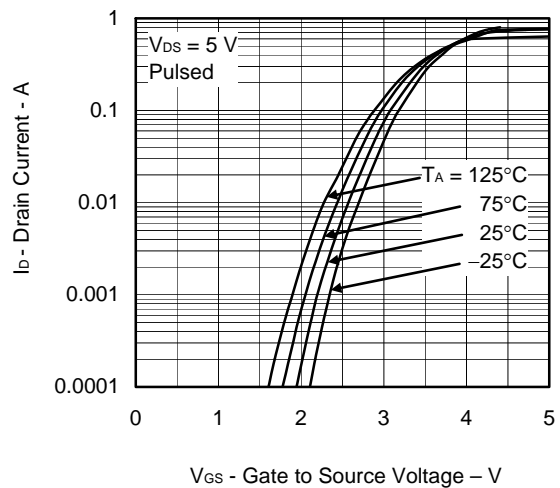
FORWARD BIAS SAFE OPERATING AREA



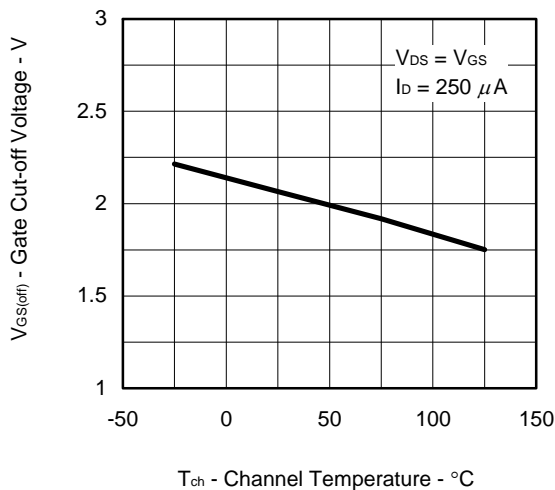
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



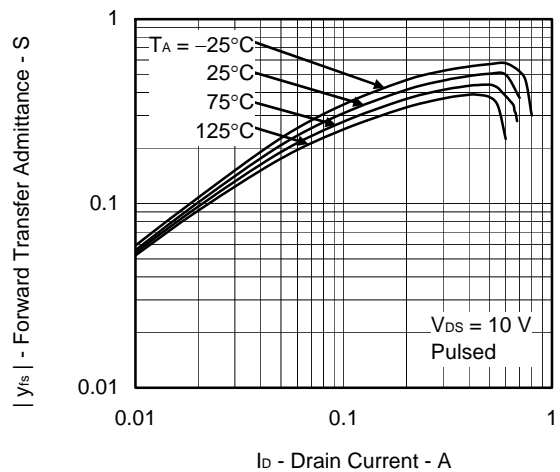
FORWARD TRANSFER CHARACTERISTICS



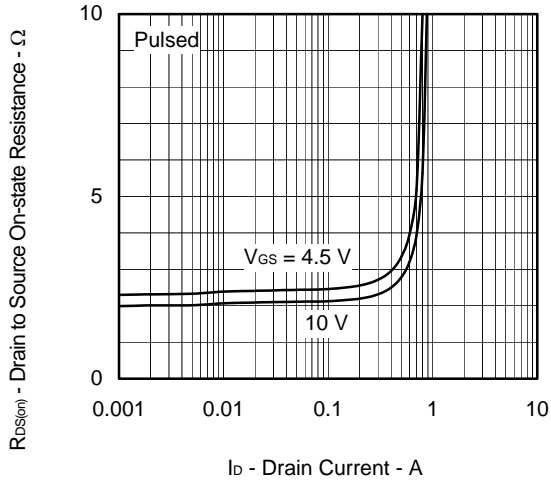
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



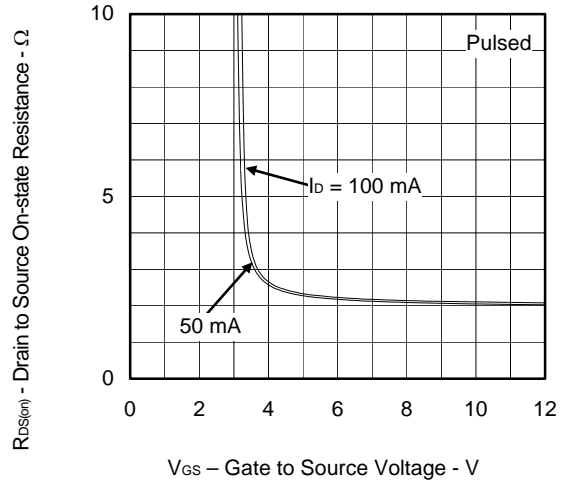
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



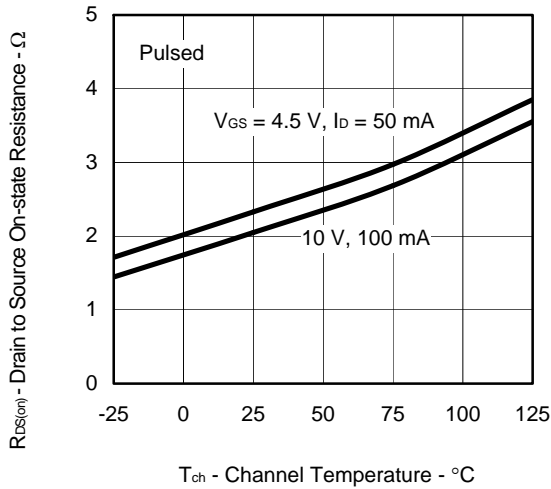
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



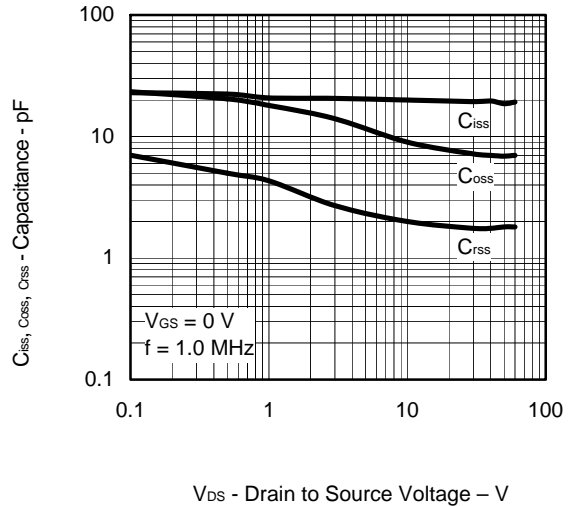
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



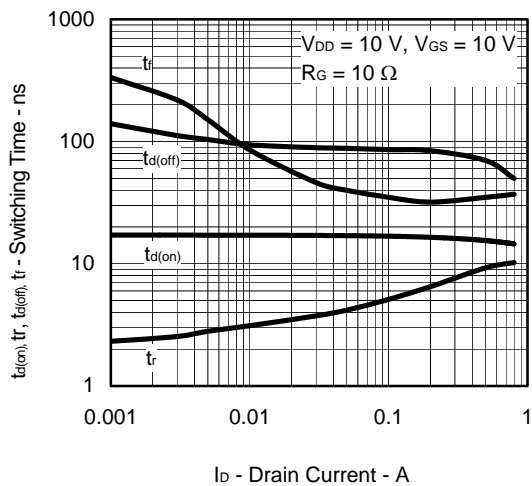
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



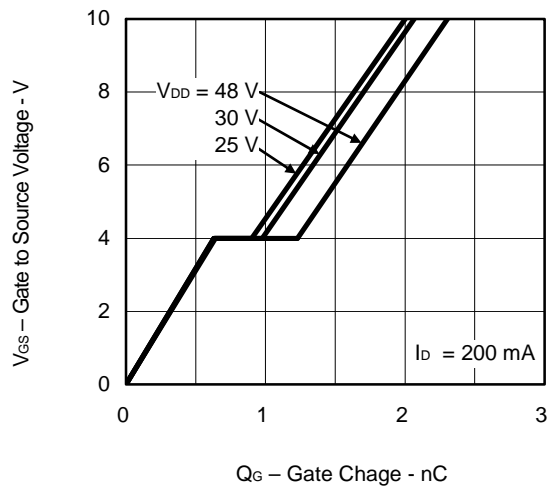
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



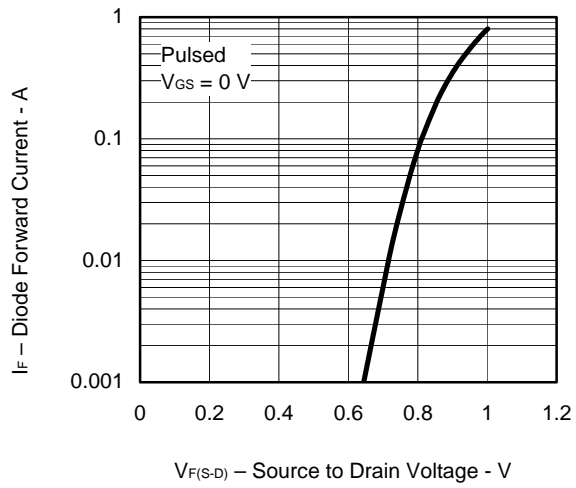
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS

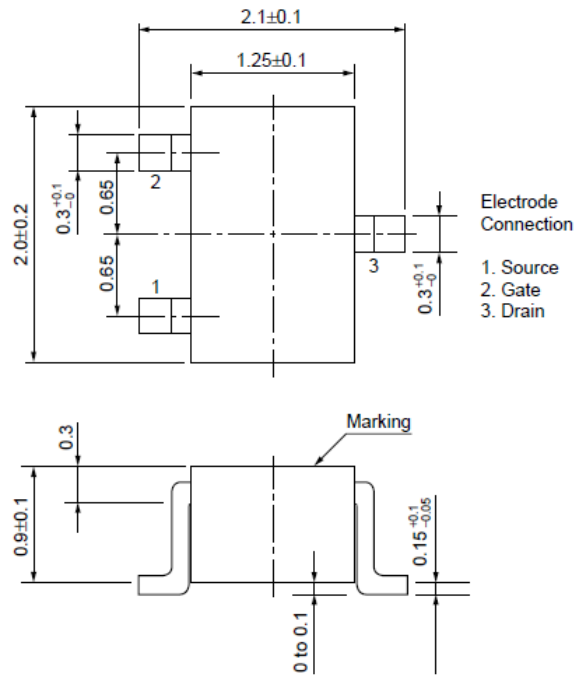


## SOURCE TO DRAIN DIODE FORWARD VOLTAGE

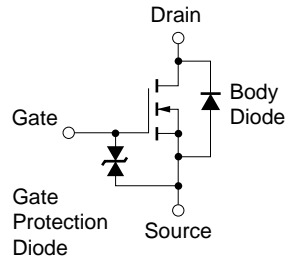


Package Drawings (Unit: mm)

SC-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.

	<b>2SK3054C</b>
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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
3.00	May,2016	1	Part Number Modify

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