

MOS FIELD EFFECT TRANSISTOR  
**2SK2053**

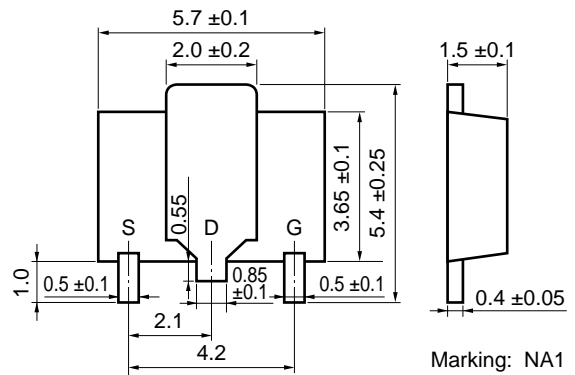
**N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING**

The 2SK2053 is an N-channel vertical MOSFET. Because it can be driven by a voltage as low as 1.5 V and it is not necessary to consider a drive current, this FET is ideal as an actuator for low-current portable systems such as headphone stereos and video cameras.

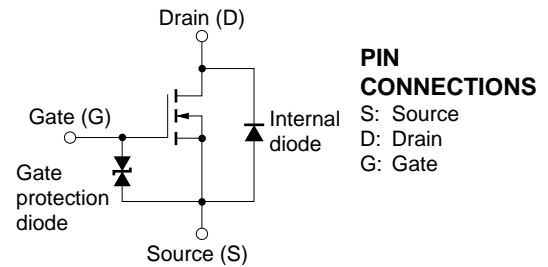
**FEATURES**

- New package intermediate between small signal and power types
- Gate can be driven by 1.5 V
- Low ON resistance  
 $R_{DS(on)} = 0.40 \Omega \text{ MAX. @ } V_{GS} = 1.5 \text{ V, } I_D = 1.0 \text{ A}$   
 $R_{DS(on)} = 0.12 \Omega \text{ MAX. @ } V_{GS} = 4.0 \text{ V, } I_D = 2.5 \text{ A}$

**PACKAGE DIMENSIONS (in mm)**



**EQUIVALENT CURCUIT**



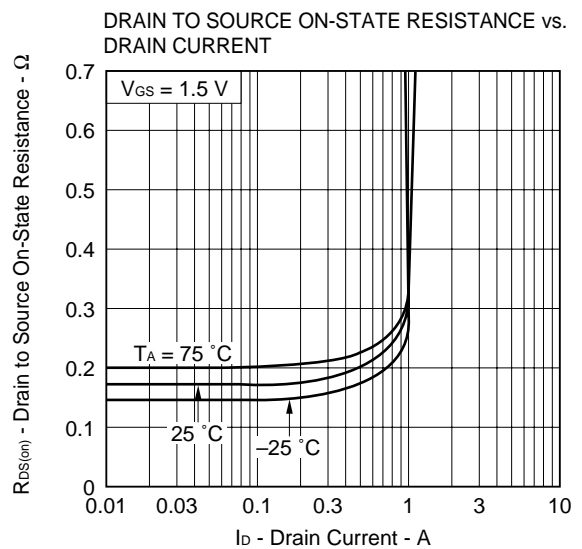
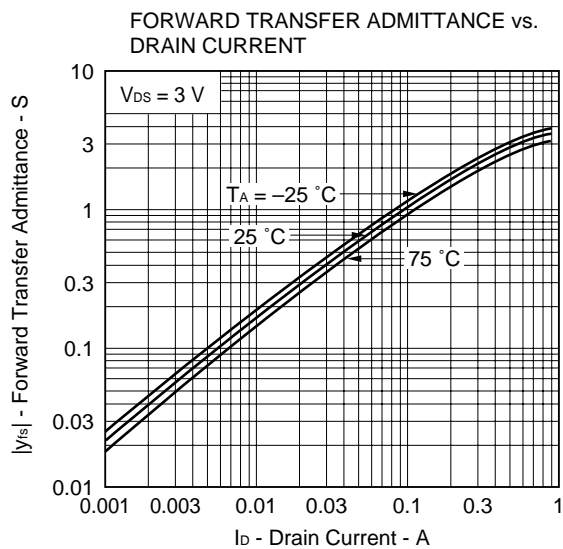
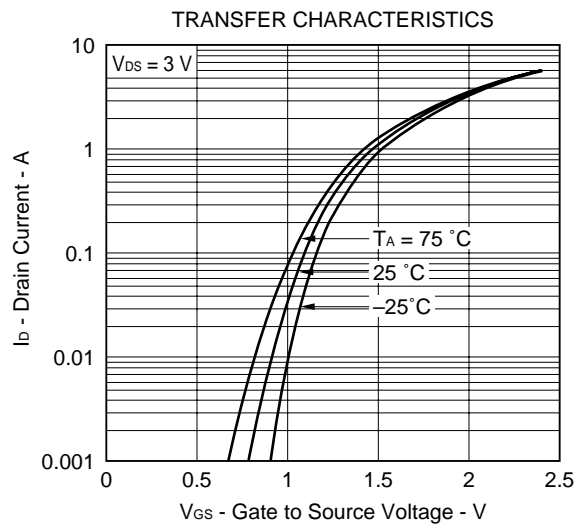
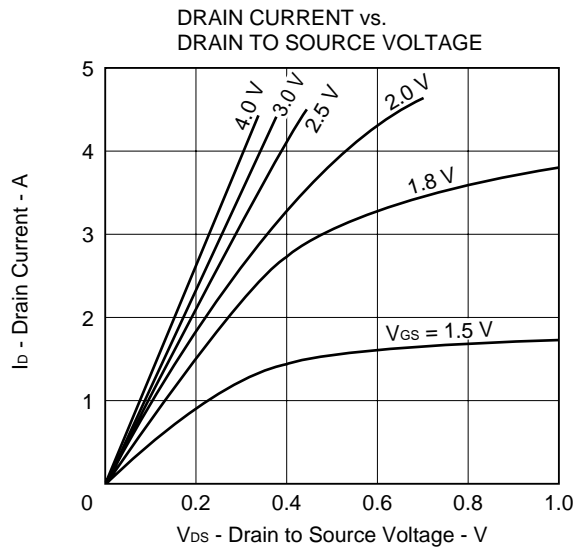
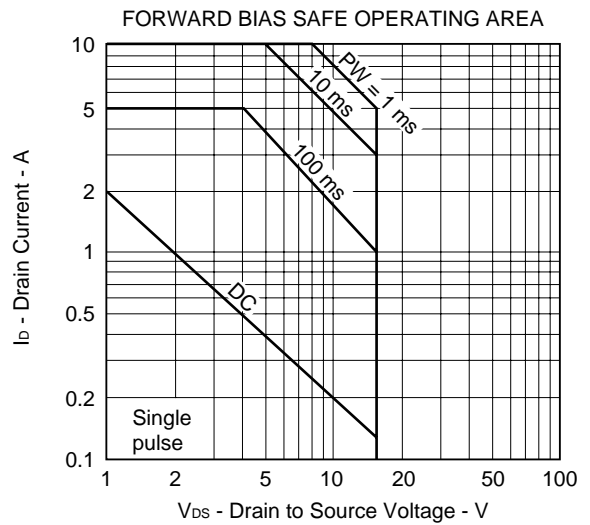
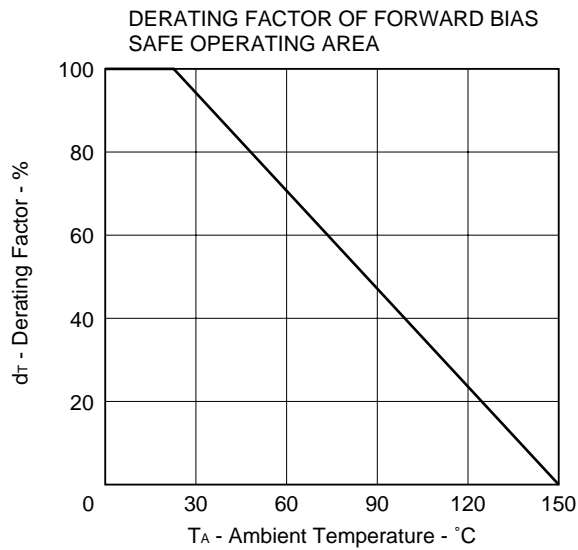
**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25 °C)**

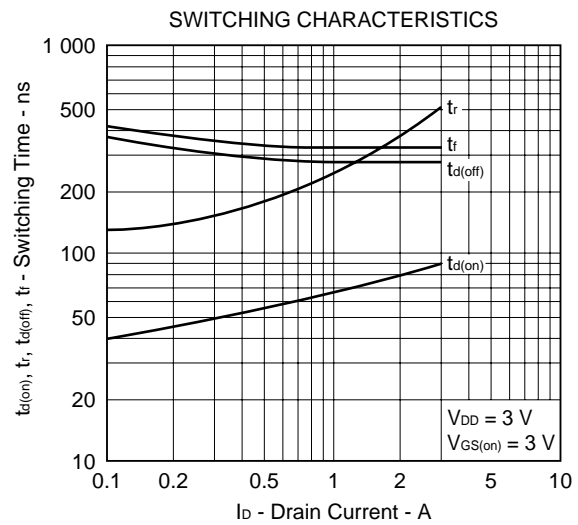
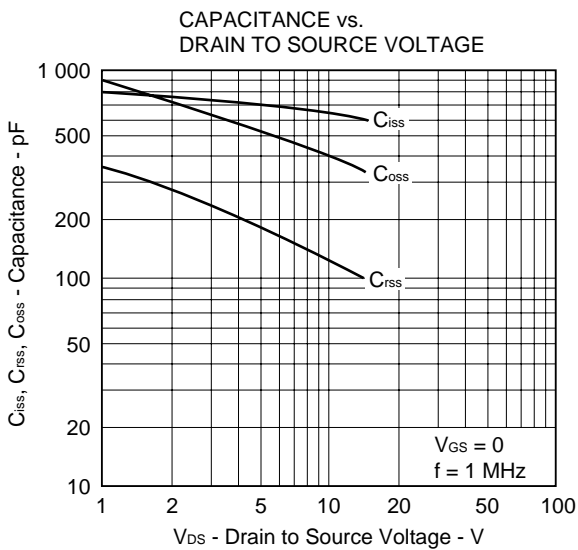
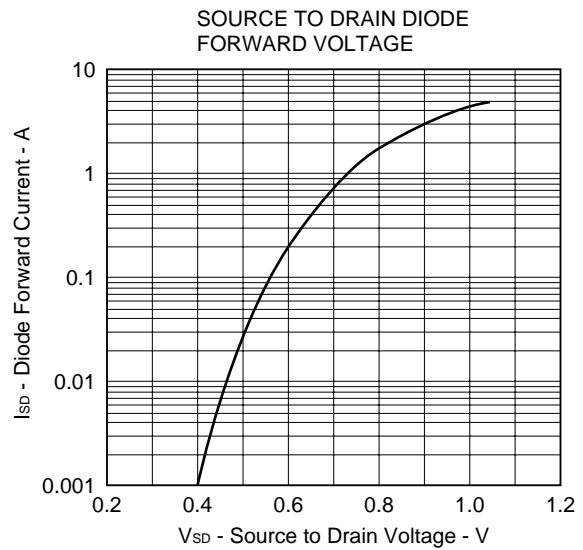
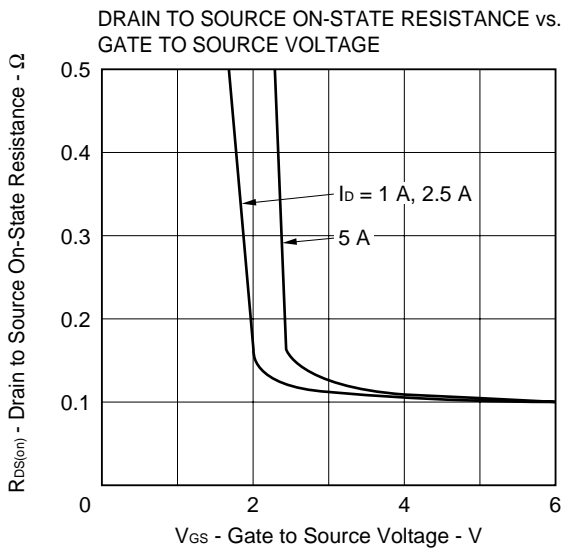
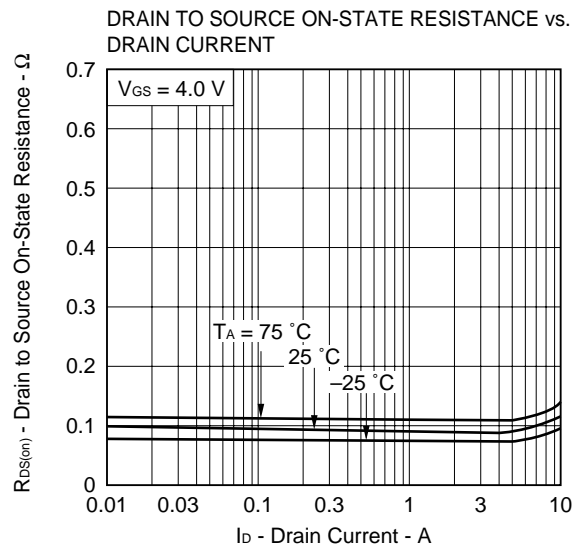
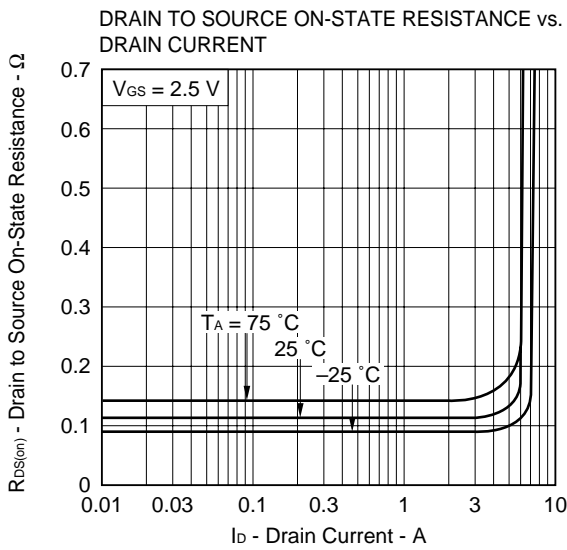
PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	$V_{DSS}$	$V_{GS} = 0$	16	V
Gate to Source Voltage	$V_{GSS}$	$V_{DS} = 0$	±7.0	V
Drain Current (DC)	$I_{D(DC)}$		±5.0	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10 \text{ ms, duty cycle} \leq 50 \%$	±10.0	A
Total Power Dissipation	$P_T$	7.5 cm <sup>2</sup> × 0.7 mm ceramic substrate used	2.0	W
Channel Temperature	$T_{ch}$		150	°C
Operating Temperature	$T_{opt}$		-20 to +60	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0			1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±7.0 V, V <sub>DS</sub> = 0			±3.0	μA
Gate Cut-Off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 3 V, I <sub>D</sub> = 1 mA	0.5	0.8	1.1	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> = 3 V, I <sub>D</sub> = 2.5 A	4			S
Drain to Source On-State Resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 1.5 V, I <sub>D</sub> = 0.5 A		0.19	0.40	Ω
Drain to Source On-State Resistance	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 2.5 A		0.08	0.15	Ω
Drain to Source On-State Resistance	R <sub>DS(on)3</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 2.5 A		0.06	0.12	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0, f = 1.0 MHz		730		pF
Output Capacitance	C <sub>oss</sub>			640		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			230		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 3 V, I <sub>D</sub> = 2.5 A, V <sub>GS(on)</sub> = 3 V, R <sub>G</sub> = 10 Ω, R <sub>L</sub> = 1.2 Ω		85		ns
Rise Time	t <sub>r</sub>			450		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>			280		ns
Fall Time	t <sub>f</sub>			310		ns

TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)





**REFERENCE**

Document Name	Document No.
NEC semiconductor device reliability/quality control system	TEI-1202
Quality grade on NEC semiconductor devices	IEI-1209
Semiconductor device mounting technology manual	C10535E
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	X10679E

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Anti-radioactive design is not implemented in this product.