

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.

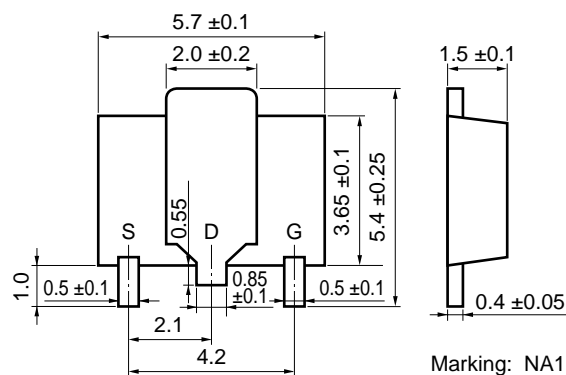
FEATURES

- New package intermediate between small signal and power types
- Gate can be driven by 1.5 V
- Low ON resistance

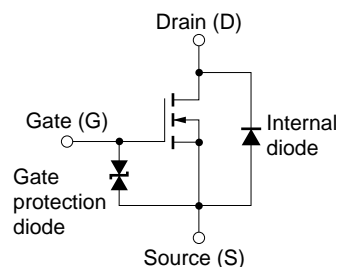
$R_{DS(on)} = 0.40 \, \Omega \text{ MAX.}$ @ $V_{GS} = 1.5 \text{ V}$, $I_D = 1.0 \text{ A}$

$R_{DS(on)} = 0.12 \, \Omega \text{ MAX.}$ @ $V_{GS} = 4.0 \text{ V}$, $I_D = 2.5 \text{ A}$

PACKAGE DIMENSIONS (in mm)



EQUIVALENT CURCUIT



PIN CONNECTIONS

S: Source
D: Drain
G: Gate

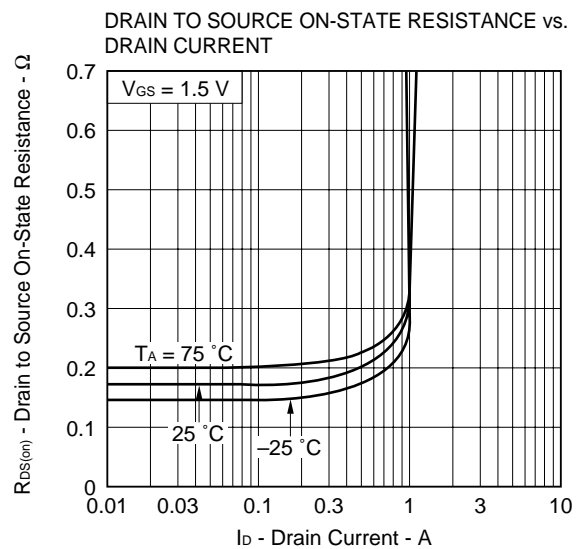
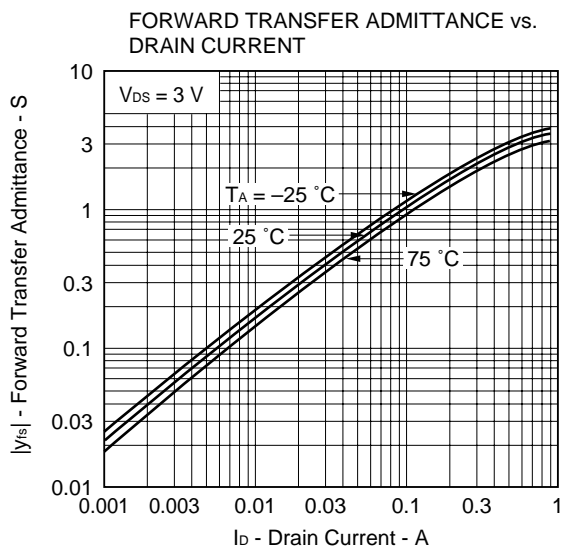
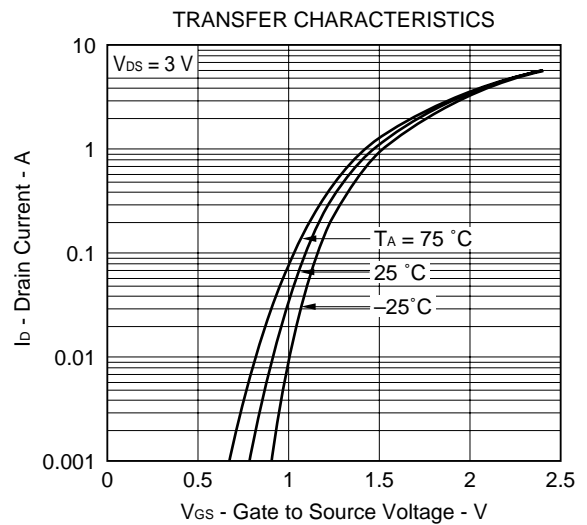
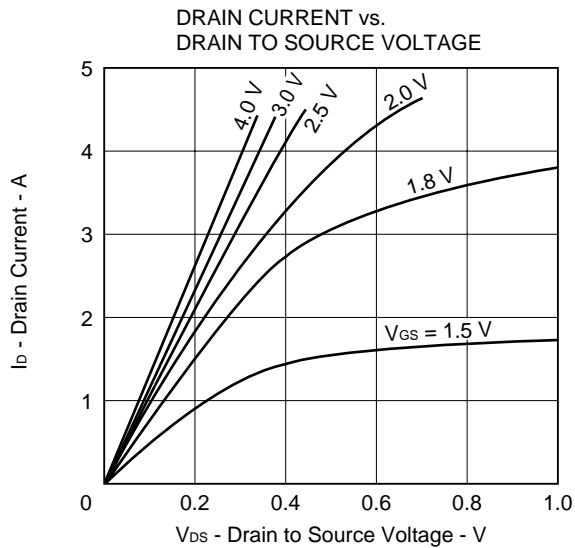
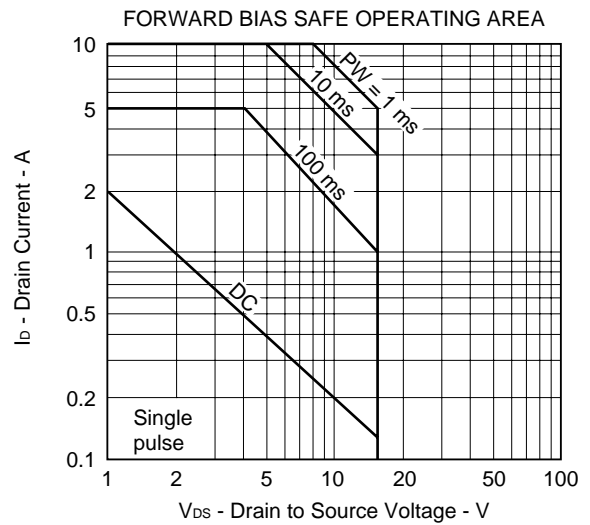
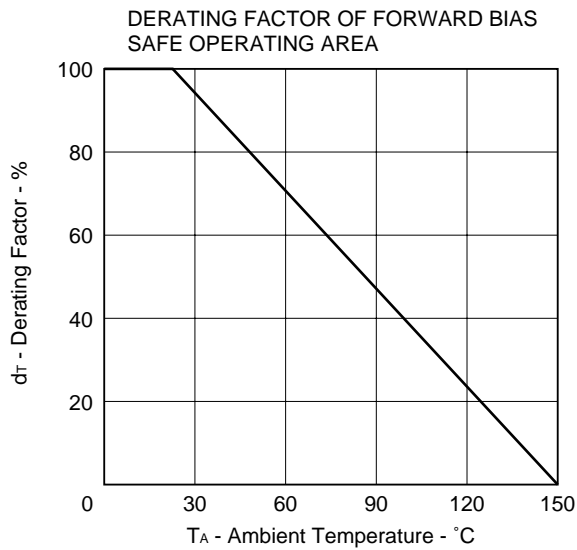
ABSOLUTE MAXIMUM RATINGS ($T_A = 25 \, ^\circ\text{C}$)

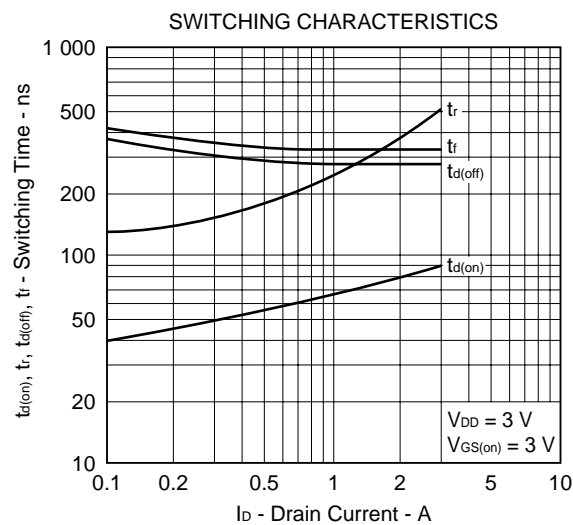
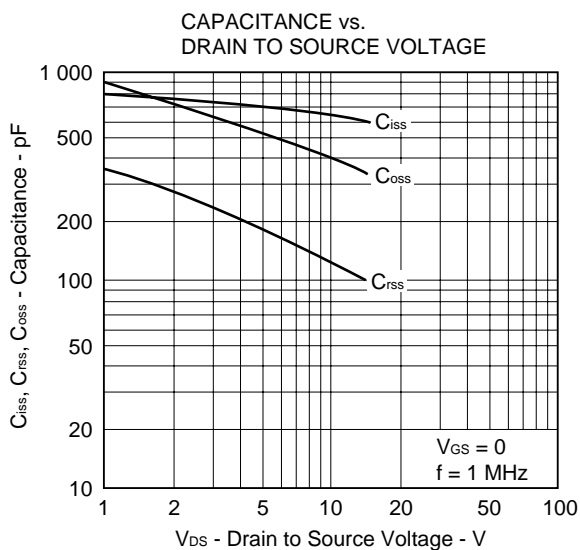
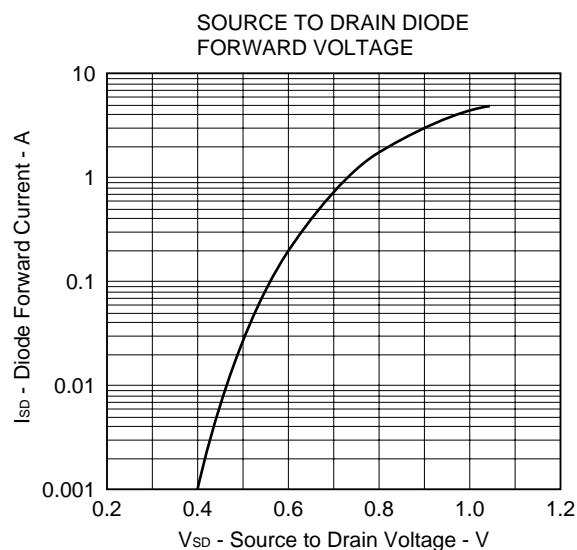
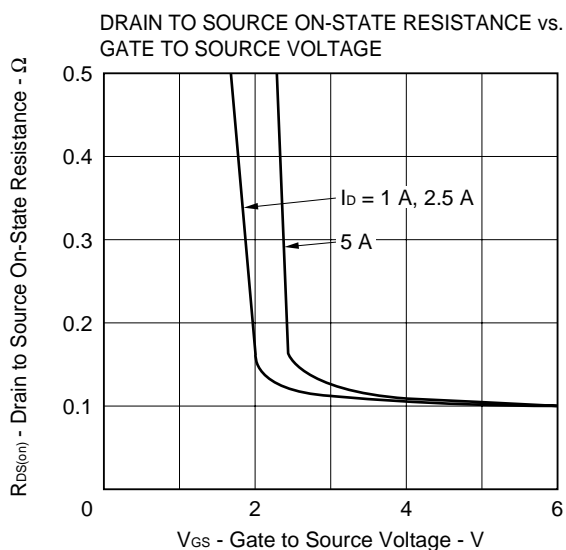
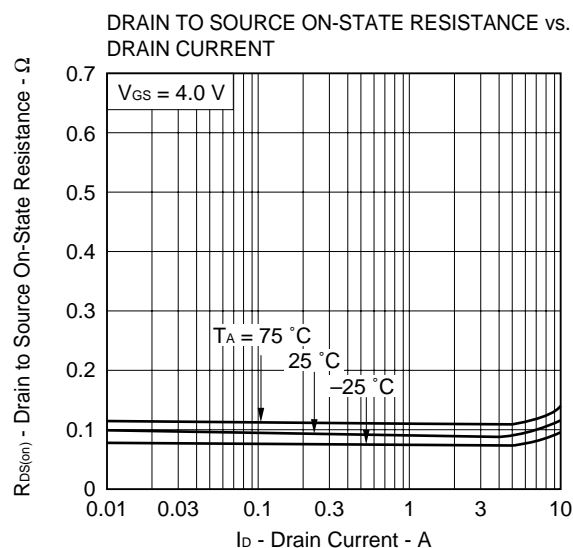
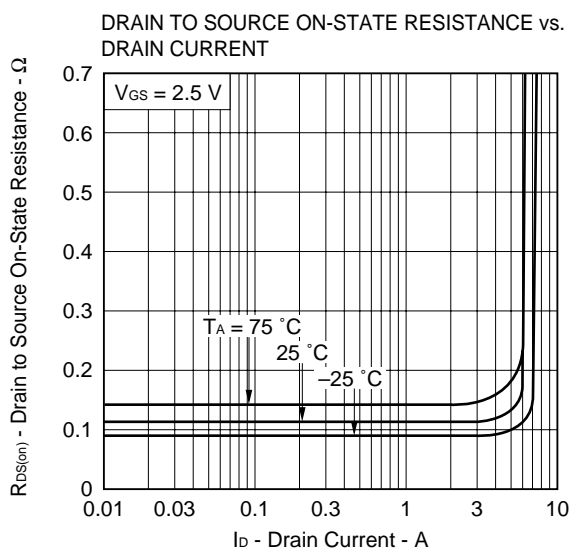
PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	V_{DS}	$V_{GS} = 0$	16	V
Gate to Source Voltage	V_{GS}	$V_{DS} = 0$	± 7.0	V
Drain Current (DC)	$I_{D(PC)}$		± 5.0	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10 \text{ ms}$, duty cycle $\leq 50 \%$	± 10.0	A
Total Power Dissipation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

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

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

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)





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.