

# MOS FIELD EFFECT TRANSISTOR

## 2SK2158

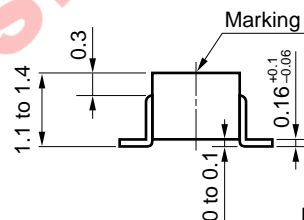
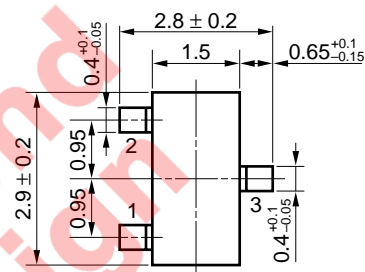
### N-CHANNEL MOS FET FOR HIGH-SPEED SWITCHING

The 2SK2158 is an N-channel vertical type MOS FET featuring an operating voltage as low as 1.5 V. Because it can be driven on a low voltage and it is not necessary to consider driving current, the 2SK2158 is suitable for use in low-voltage portable systems such as headphone stereo sets and camcorders.

#### FEATURES

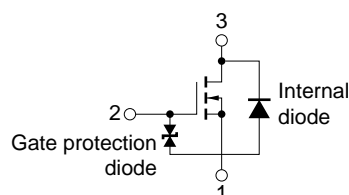
- Capable of drive gate with 1.5 V
- Because of high input impedance, there is no need to consider driving current.
- Bias resistance can be omitted, enabling reduction in total number of parts.

#### PACKAGE DIMENSIONS (in millimeters)



Marking: G23

#### EQUIVALENT CIRCUIT



#### PIN CONNECTION

1. Source (S)
2. Gate (G)
3. Drain (D)

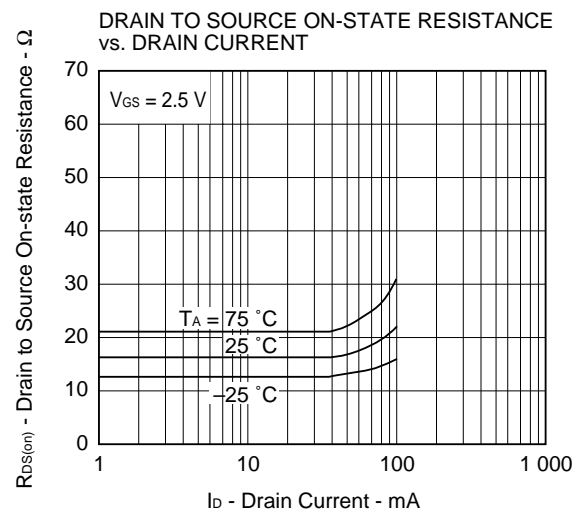
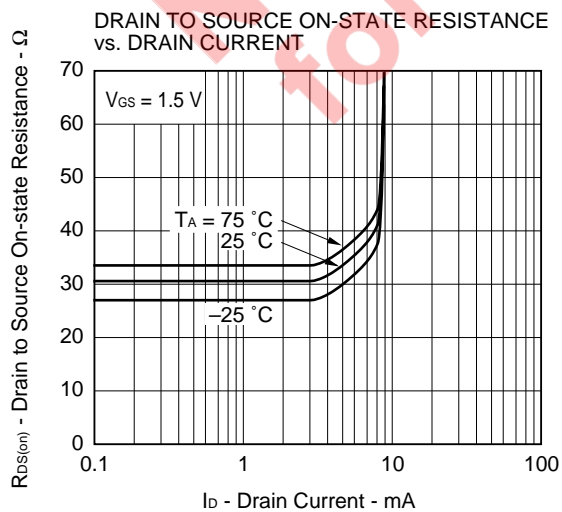
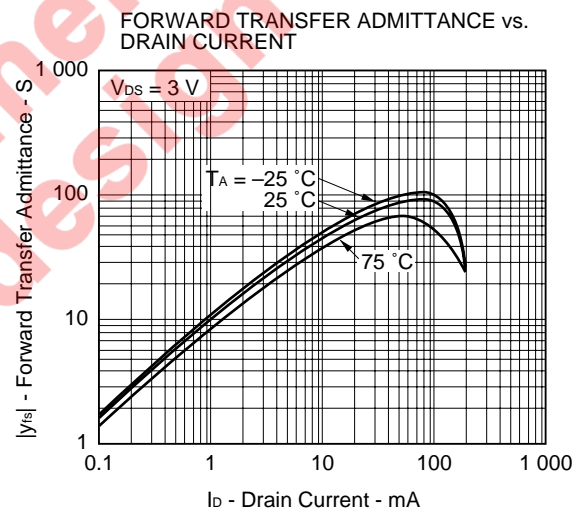
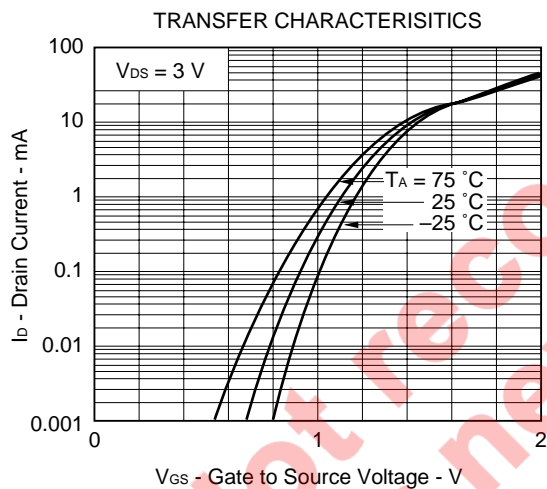
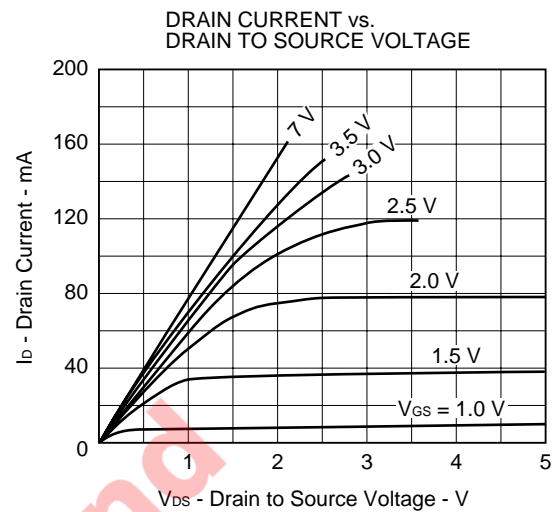
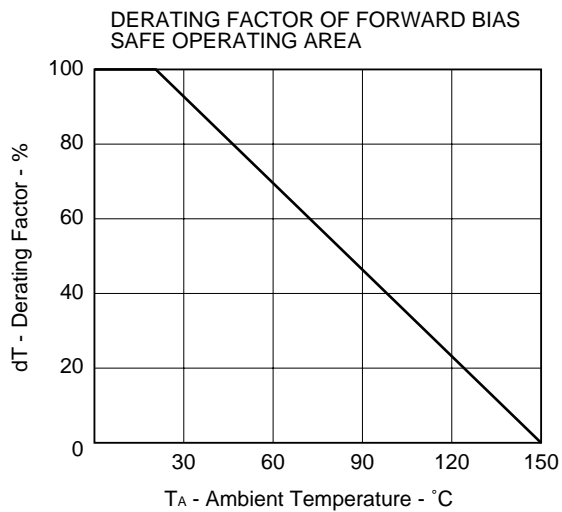
#### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

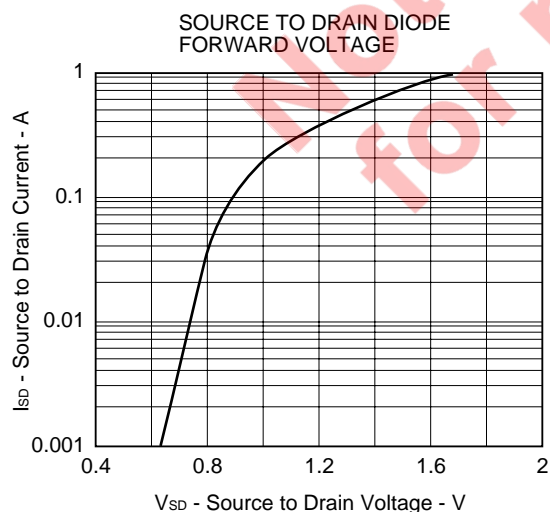
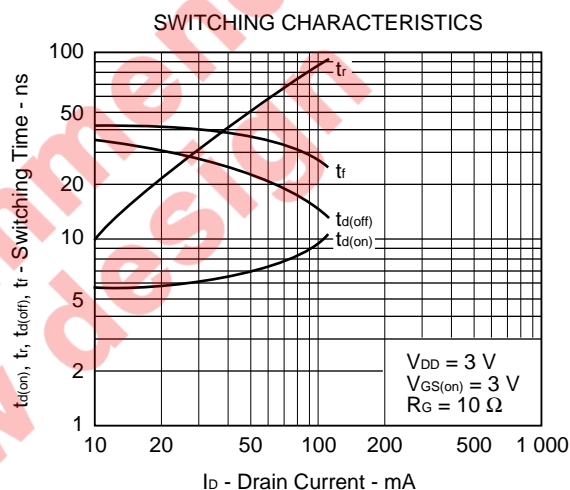
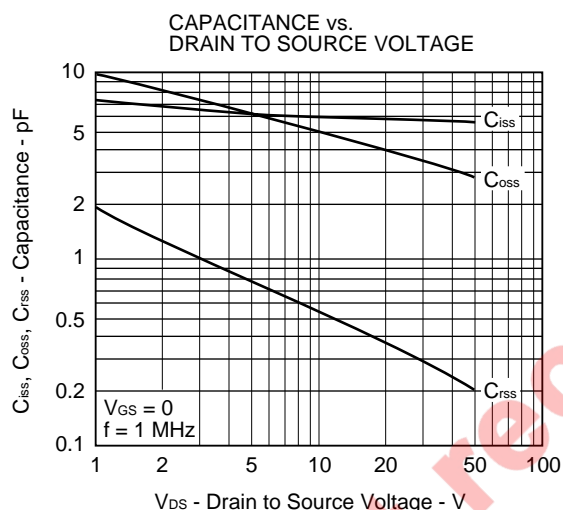
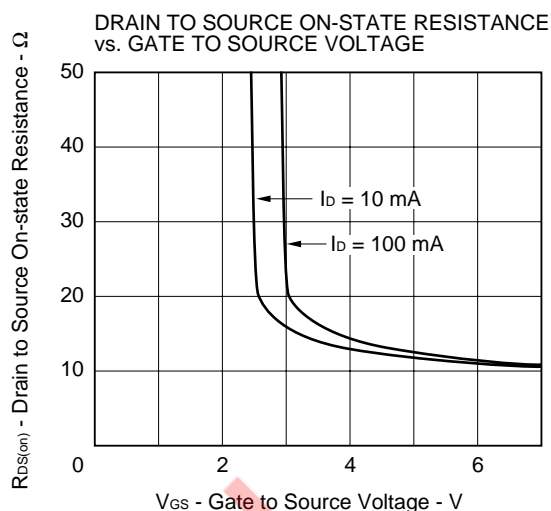
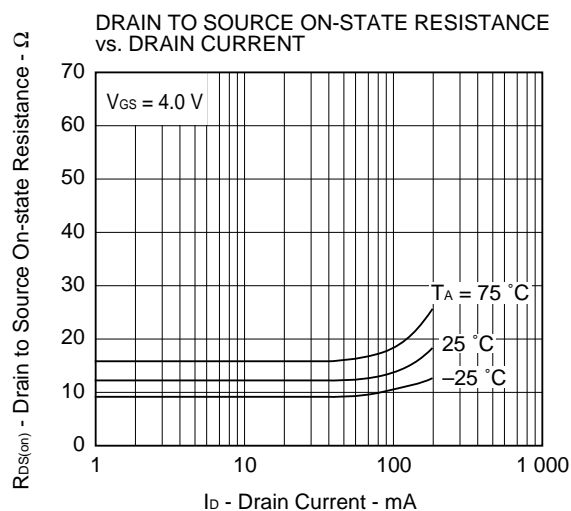
PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Drain to Source Voltage	$V_{DS}$	$V_{GS} = 0$	50	V
Gate to Source Voltage	$V_{GS}$	$V_{DS} = 0$	$\pm 7.0$	V
Drain Current (DC)	$I_{D(DC)}$		$\pm 0.1$	A
Drain Current (pulse)	$I_{D(pulse)}$	$PW \leq 10 \text{ ms}$ , Duty Cycle $\leq 50 \%$	$\pm 0.2$	A
Total Power Dissipation	$P_T$		200	mW
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

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> = 50 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> = 1.0 μA	0.5	0.7	1.1	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> = 3 V, I <sub>D</sub> = 10 mA	20			mS
Drain to Source On-state Resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 1.5 V, I <sub>D</sub> = 1.0 mA		32	50	Ω
Drain to Source On-state Resistance	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 10 mA		16	20	Ω
Drain to Source On-state Resistance	R <sub>DS(on)3</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 10 mA		12	15	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 3 V, V <sub>GS</sub> = 0 f = 1.0 MHz		6		pF
Output Capacitance	C <sub>oss</sub>			8		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			1		pF
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 3 V, I <sub>D</sub> = 20 mA V <sub>GS(on)</sub> = 3 V, R <sub>G</sub> = 10 Ω R <sub>L</sub> = 150 Ω		9		ns
Rise Time	t <sub>r</sub>			48		ns
Turn-Off Delay Time	t <sub>d(off)</sub>			21		ns
Fall Time	t <sub>f</sub>			31		ns

Not recommended  
for new designs

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



## 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

Not recommend  
for new design

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Anti-radioactive design is not implemented in this product.