

# MOS FIELD EFFECT TRANSISTOR 2SJ411

### P-CHANNEL SIGNAL MOS FET FOR SWITCHING

The 2SJ411 is a P-channel MOS FET of a vertical type and is a switching element that can be directly driven by the output of an IC operating at 5 V.

This product has a low ON resistance and superb switching characteristics and is ideal for power control switches and DC/DC converters.

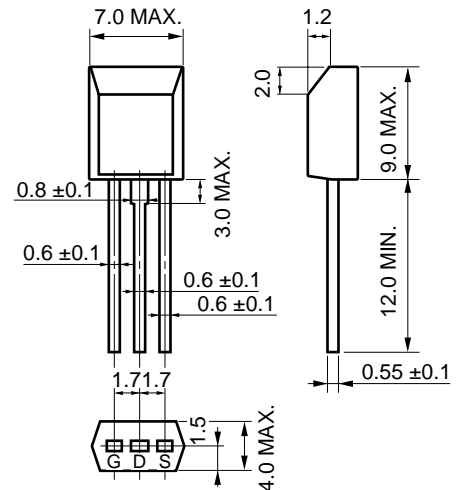
#### FEATURES

- Radial taping supported
- Can be directly driven by 5-V IC
- Low ON resistance

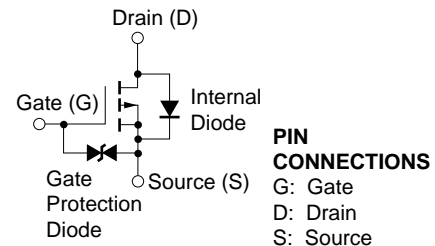
$$R_{DS(on)} = 0.24 \Omega \text{ MAX. @ } V_{GS} = -4 \text{ V, } I_D = -2.5 \text{ A}$$

$$R_{DS(on)} = 0.11 \Omega \text{ MAX. @ } V_{GS} = -10 \text{ V, } I_D = -2.5 \text{ A}$$

#### PACKAGE DIMENSIONS (in mm)



#### EQUIVALENT CIRCUIT



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

PARAMETER	SYMBOL	TEST CONDITIONS	RATING	UNIT
Drain to Source Voltage	$V_{DSS}$	$V_{GS} = 0$	-30	V
Gate to Source Voltage	$V_{GSS}$	$V_{DS} = 0$	-20/+10	V
Drain Current (DC)	$I_{D(DC)}$		$\pm 5.0$	A
Drain Current (Pulse)	$I_{D(pulse)}$	$PW \leq 10 \mu s$ Duty cycle $\leq 1 \%$	$\pm 20.0$	A
Total Power Dissipation	$P_{T1}$	$T_A = 25 \text{ }^\circ\text{C}$	1.0	W
Total Power Dissipation	$P_{T2}$	$T_C = 25 \text{ }^\circ\text{C}$	6.0	W
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

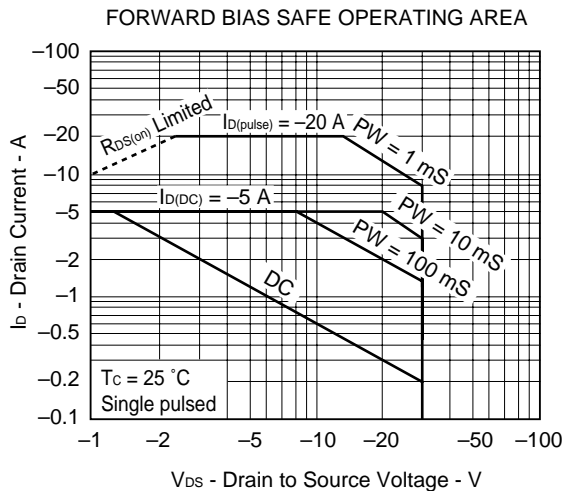
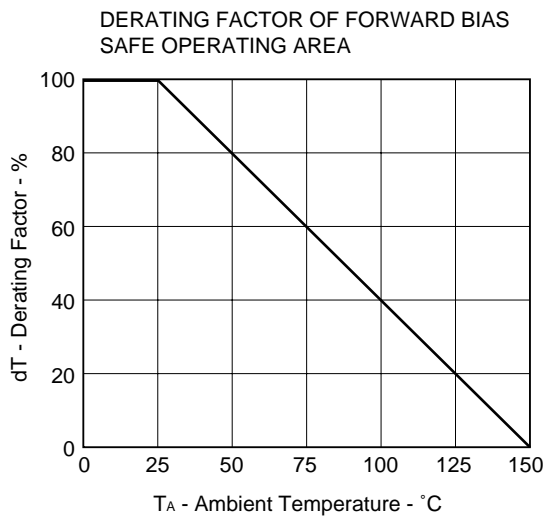
The internal diode connected between the gate and source of this product is to protect the product from static electricity. If the product is used in a circuit where the rated voltage of the product may be exceeded, connect a protection circuit.

The information in this document is subject to change without notice.

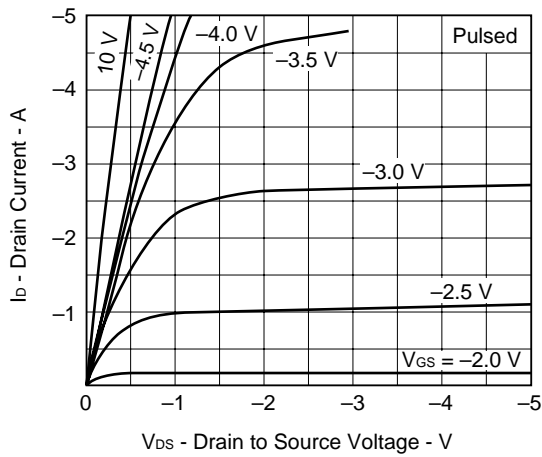
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> = -30 V, V <sub>GS</sub> = 0			-10	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = -16/+10 V, V <sub>DS</sub> = 0			±10	μA
Gate Cut-Off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -1 mA	-1.0	-1.4	-2.0	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -2.5 A	3.0			S
Drain to Source On-State Resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> = -4 V, I <sub>D</sub> = -2.5 A		0.175	0.24	Ω
Drain to Source On-State Resistance	R <sub>DS(on)2</sub>	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -2.5 A		0.096	0.11	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -10 V, V <sub>GS</sub> = 0		790		pF
Output Capacitance	C <sub>oss</sub>	f = 1.0 MHz		580		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			280		pF
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -15 V, I <sub>D</sub> = -2.5 A		10		ns
Rise Time	t <sub>r</sub>	V <sub>GS(on)</sub> = -10 V		110		ns
Turn-Off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> = 10 Ω, R <sub>L</sub> = 6 Ω		195		ns
Fall Time	t <sub>f</sub>			185		ns
Gate Input Charge	Q <sub>G</sub>	V <sub>DS</sub> = -24 V		29.8		nC
Gate to Source Charge	Q <sub>GS</sub>	V <sub>GS</sub> = -10 V		2.7		nC
Gate to Drain Charge	Q <sub>GD</sub>	I <sub>D</sub> = -5.0 A, I <sub>G</sub> = -2 mA		11.5		nC
Internal Diode Forward Voltage	V <sub>F(S-D)</sub>	I <sub>F</sub> = 5.0 A, V <sub>GS</sub> = 0		1.0		V
Internal Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 5.0 A, V <sub>GS</sub> = 0		140		ns
Internal Diode Reverse Recovery Charge	Q <sub>rr</sub>	di/dt = 50 A/μs		160		nC

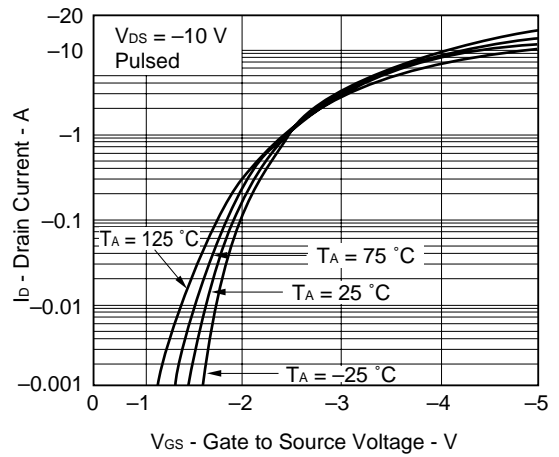
**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**



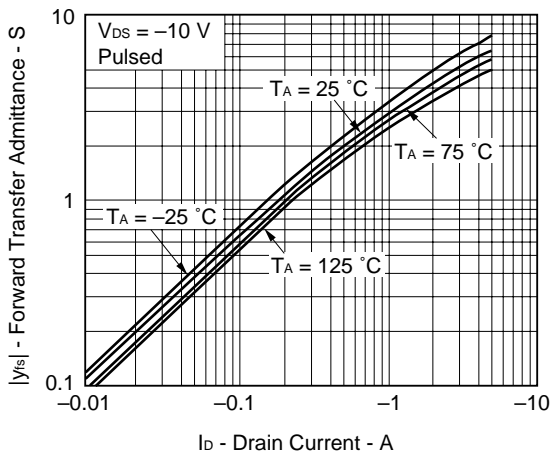
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



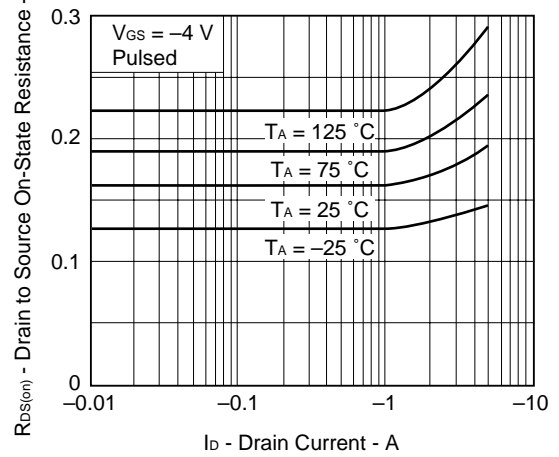
TRANSFER CHARACTERISTICS



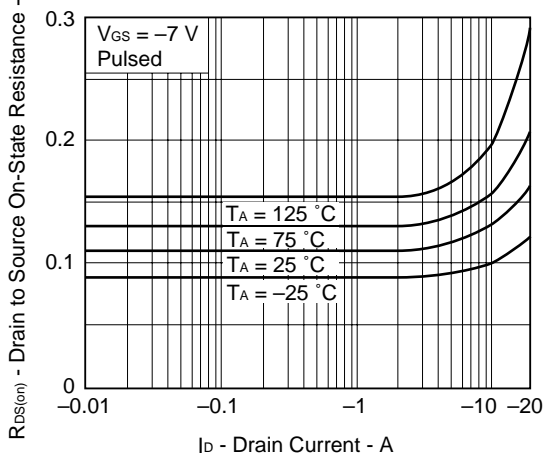
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



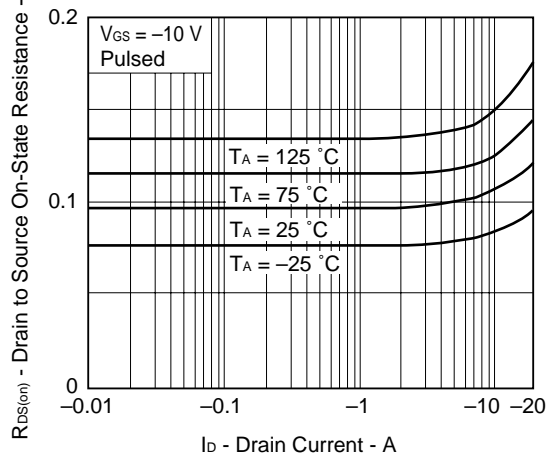
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



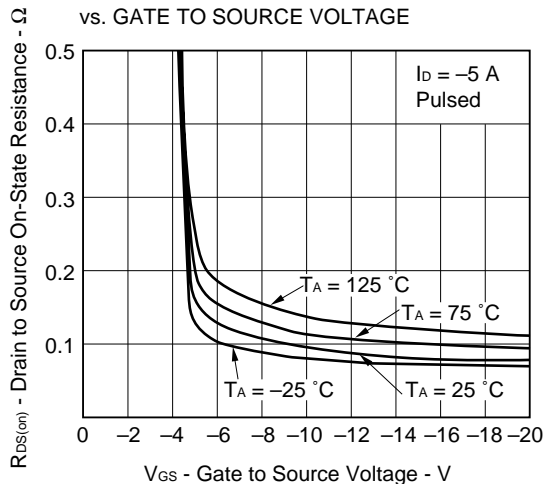
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



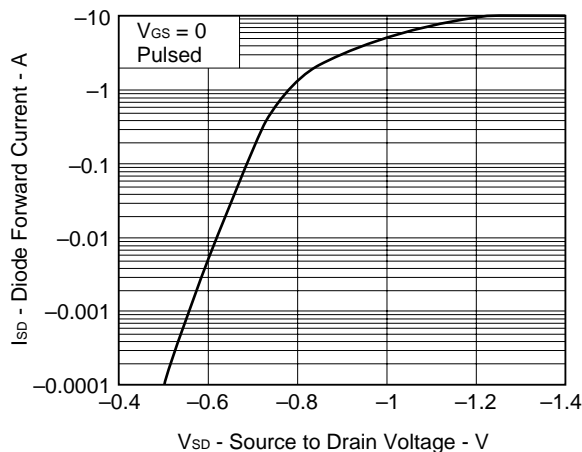
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



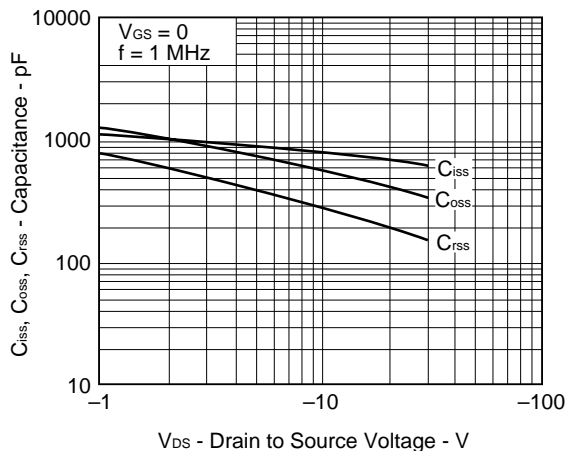
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



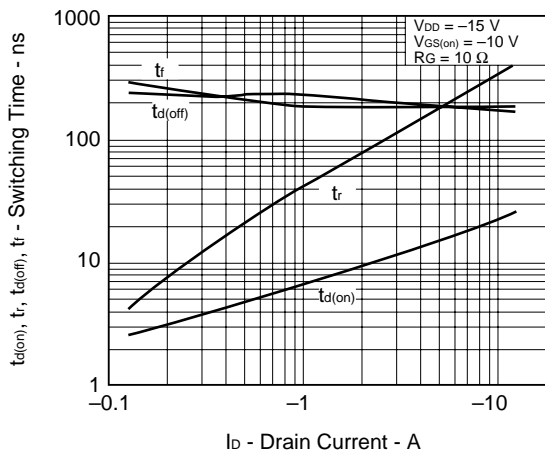
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



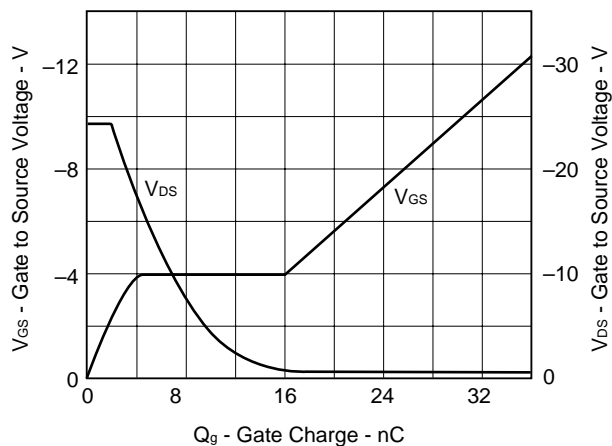
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE

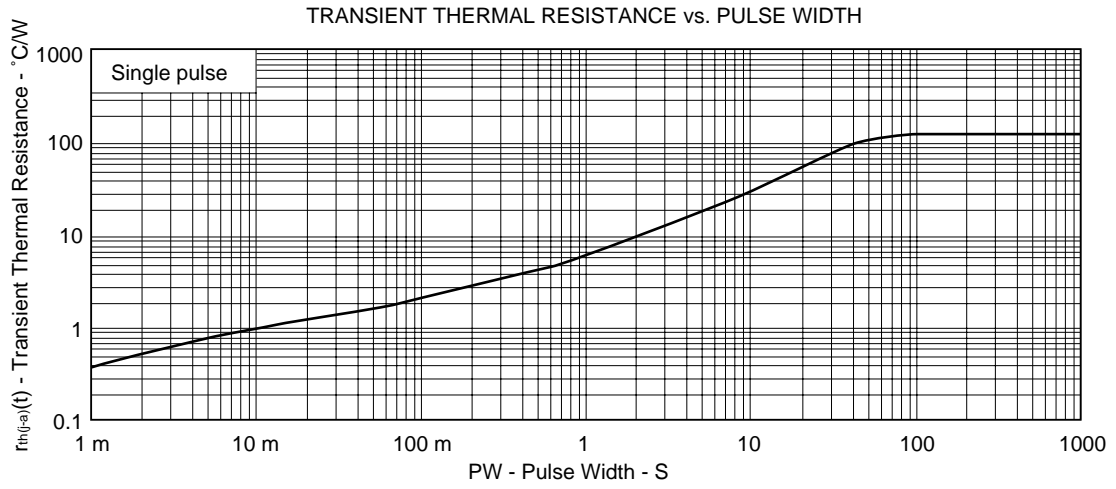


SWITCHING CHARACTERISTICS



DYNAMIC INPUT/OUTPUT CHARACTERISTICS





**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.