

MOS FIELD EFFECT TRANSISTOR

2SJ462

P-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR HIGH SPEED SWITCHING

DESCRIPTION

The 2SJ462 is a switching device which can be driven directly by an IC operating at 3 V.

The 2SJ462 features a low on-state resistance and can be driven by a low voltage power source, so it is suitable for applications such as power management.

FEATURES

- Can be driven by a 2.5 V power source.
- New-type compact package.

Has advantages of packages for small signals and for power transistors, and compensates those disadvantages.

- Low on-state resistance.

$R_{DS(ON)}$: 0.29 Ω MAX. @ $V_{GS} = -2.5$ V, $I_D = -0.5$ A

$R_{DS(ON)}$: 0.19 Ω MAX. @ $V_{GS} = -4.0$ V, $I_D = -1.0$ A

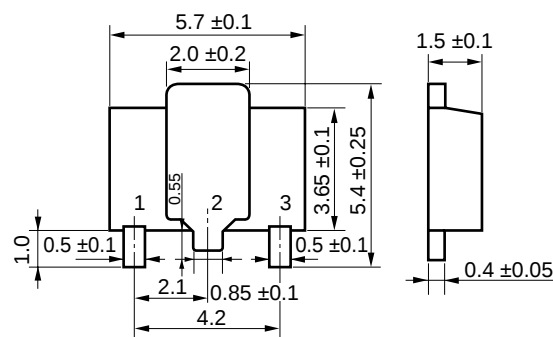
ABSOLUTE MAXIMUM RATINGS ($T_A = +25^\circ\text{C}$)

Drain to Source Voltage	V_{DSS}	-12	V
Gate to Source Voltage	V_{GSS}	± 8.0	V
Drain Current (DC)	$I_{D(DC)}$	± 2.5	A
Drain Current (pulse)	$I_{D(pulse)}$	$\pm 5.0^*$	A
Total Power Dissipation	P_T	2.0**	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

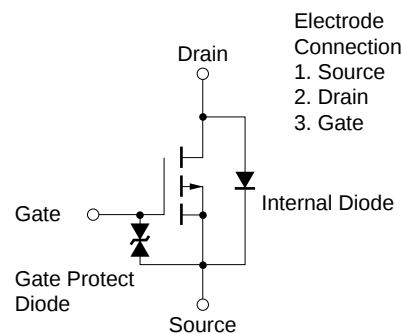
* $PW \leq 10$ ms, Duty Cycle $\leq 1\%$

** Mounted on ceramic board of $7.5\text{ cm}^2 \times 0.7\text{ mm}$

Package Drawings (unit : mm)



Equivalent Circuit

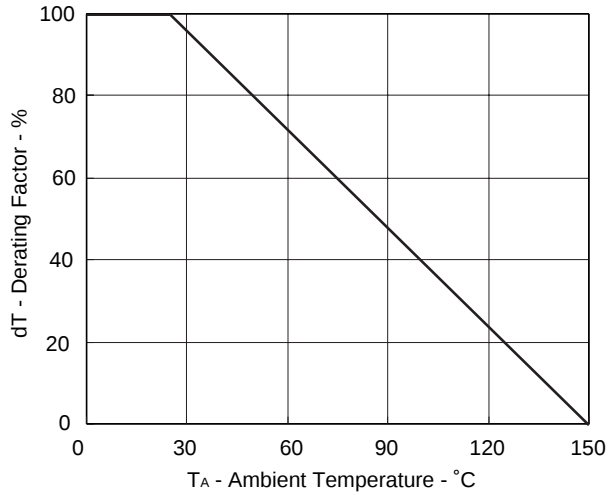


Marking : UA3

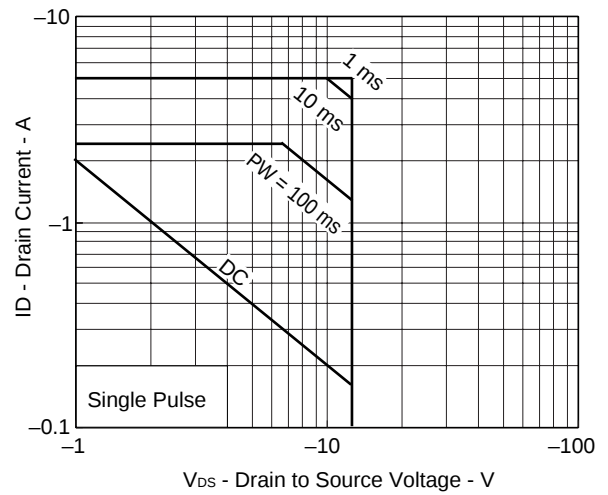
ELECTRICAL SPECIFICATIONS ($T_A = +25\text{ }^{\circ}\text{C}$)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Conditions
Drain Cut-off Current	I_{DSS}			-10	μA	$V_{DS} = -12\text{ V}$, $V_{GS} = 0$
Gate Leakage Current	I_{GSS}			± 10	μA	$V_{GS} = \pm 8.0\text{ V}$, $V_{DS} = 0$
Gate Cut-off Voltage	$V_{GS(off)}$	-0.7	-1.0	-1.3	V	$V_{DS} = -3.0\text{ V}$, $I_D = -1.0\text{ mA}$
Forward Transfer Admittance	$ y_{fs} $	1.5			S	$V_{DS} = -3.0\text{ V}$, $I_D = -1.0\text{ A}$
Drain to Source On-State Resistance	$R_{DS(on)1}$		195	290	$\text{m}\Omega$	$V_{GS} = -2.5\text{ V}$, $I_D = -0.5\text{ A}$
Drain to Source On-State Resistance	$R_{DS(on)2}$		135	190	$\text{m}\Omega$	$V_{GS} = -4.0$, $I_D = -1.0\text{ A}$
Input Capacitance	C_{iss}		940		pF	$V_{DS} = -3.0\text{ V}$, $V_{GS} = 0$ $f = 1.0\text{ MHz}$
Output Capacitance	C_{oss}		835		pF	
Reverse Transfer Capacitance	C_{rss}		495		pF	
Turn-On Delay Time	$t_{d(on)}$		45		ns	$V_{DD} = -3.0\text{ V}$, $I_D = -1.0\text{ A}$ $V_{GS(on)} = -3.0\text{ V}$, $R_G = 10\text{ }\Omega$ $R_L = 3.0\text{ }\Omega$
Rise Time	t_r		225		ns	
Turn-Off Delay Time	$t_{d(off)}$		140		ns	
Fall Time	t_f		195		ns	
Total Gate Charge	Q_G		12		nC	$V_{DS} = -8\text{ V}$, $I_D = -2.5\text{ A}$ $V_{GS} = -3.0\text{ V}$, $I_G = -2\text{ mA}$
Gate to Source Charge	Q_{GS}		2		nC	
Gate to Drain Charge	Q_{GD}		7		nC	
Diode Forward Voltage	$V_{F(S-D)}$		-0.86		V	$I_F = -2.5\text{ A}$, $V_{GS} = 0$
Reverse Recovery Time	t_{rr}		150		ns	$I_F = -2.5\text{ A}$, $V_{GS} = 0$ $di/dt = 50\text{ A}/\mu\text{s}$
Reverse Recovery Charge	Q_{rr}		160		nC	

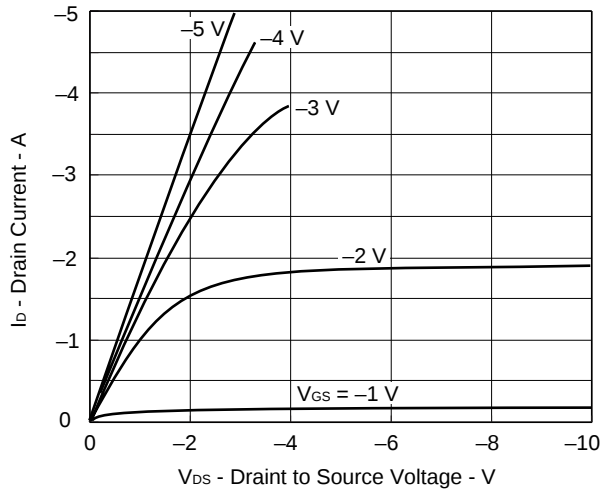
DERATING FACTOR OF FORWARD BIAS
SAFE OPERATING AREA



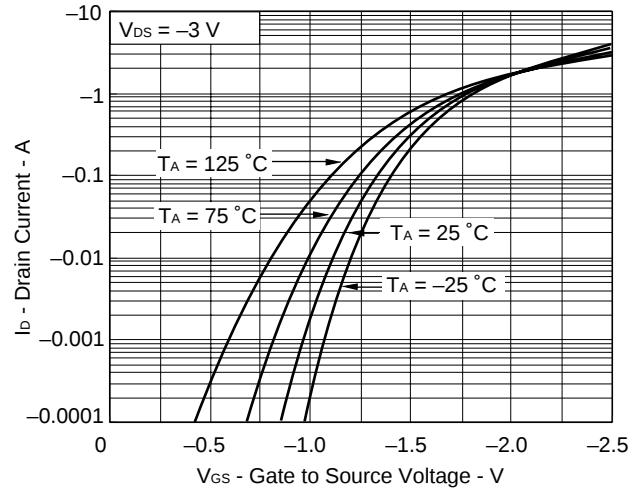
FORWARD BIAS SAFE OPERATING AREA



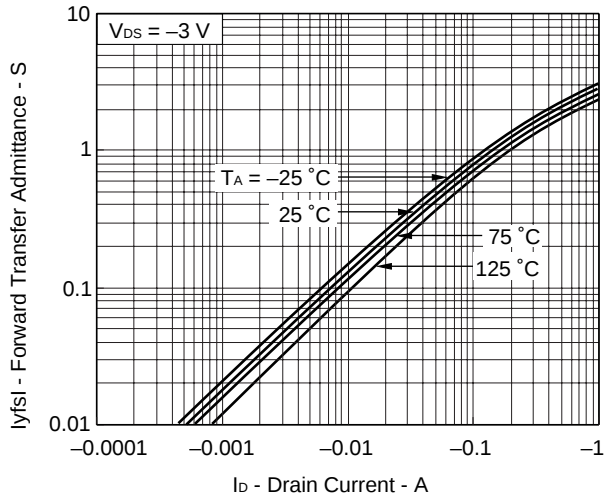
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



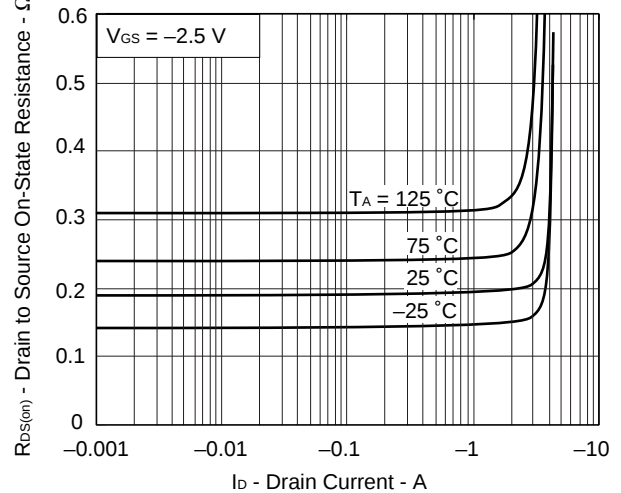
TRANSFER CHARACTERISTICS



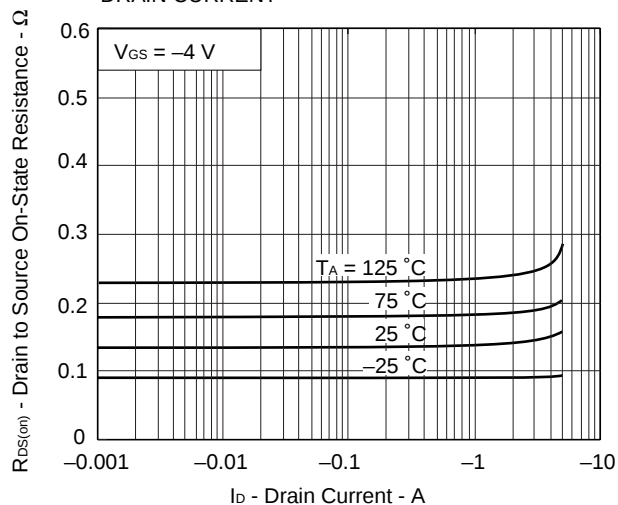
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



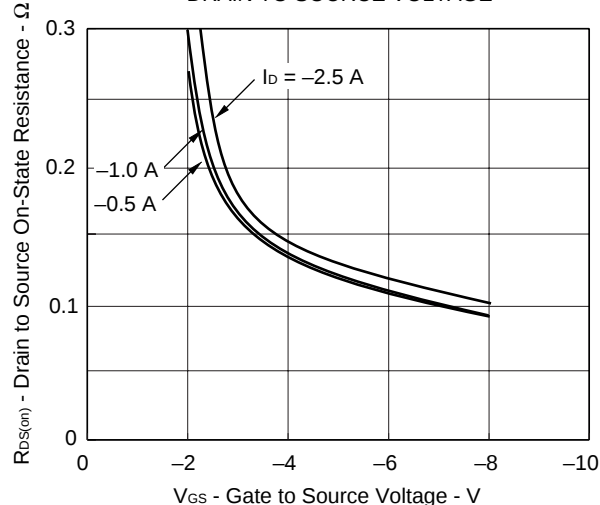
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



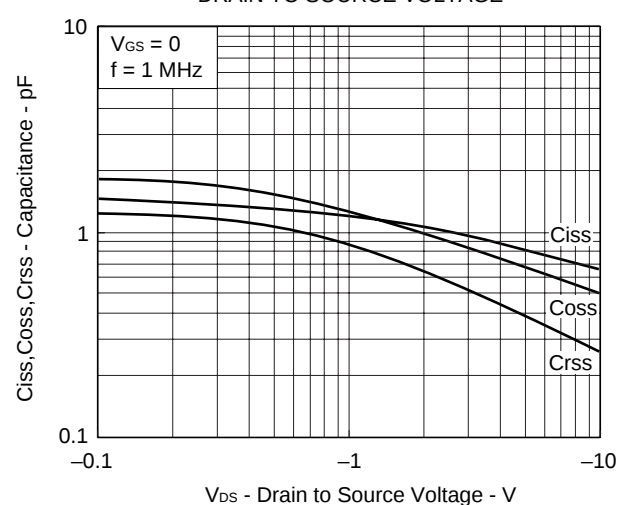
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



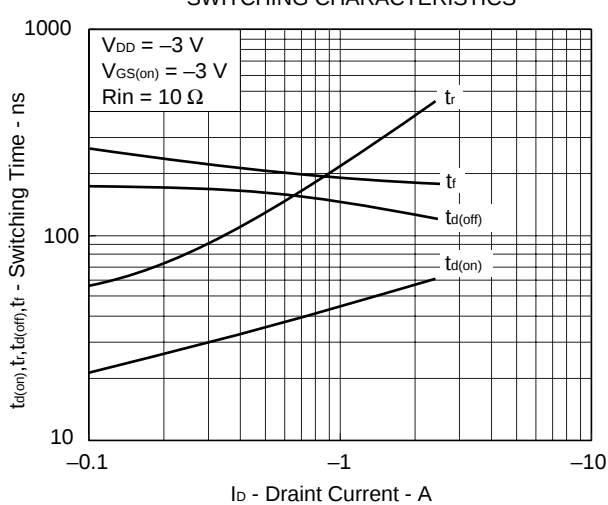
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



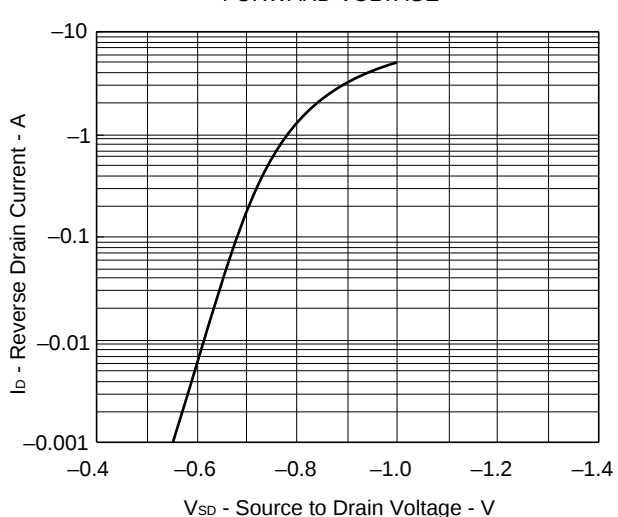
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



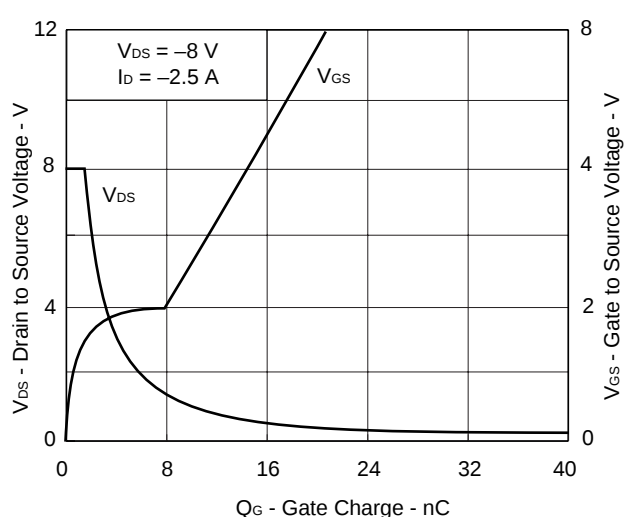
SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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

No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Corporation. NEC Corporation assumes no responsibility for any errors which may appear in this document.

NEC Corporation does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Corporation or others.

While NEC Corporation has been making continuous effort to enhance the reliability of its semiconductor devices, the possibility of defects cannot be eliminated entirely. To minimize risks of damage or injury to persons or property arising from a defect in an NEC semiconductor device, customer must incorporate sufficient safety measures in its design, such as redundancy, fire-containment, and anti-failure features.

NEC devices are classified into the following three quality grades:

“Standard”, “Special”, and “Specific”. The Specific quality grade applies only to devices developed based on a customer designated “quality assurance program” for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device before using it in a particular application.

Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

The quality grade of NEC devices in “Standard” unless otherwise specified in NEC's Data Sheets or Data Books. If customers intend to use NEC devices for applications other than those specified for Standard quality grade, they should contact NEC Sales Representative in advance.

Anti-radioactive design is not implemented in this product.