NEC

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

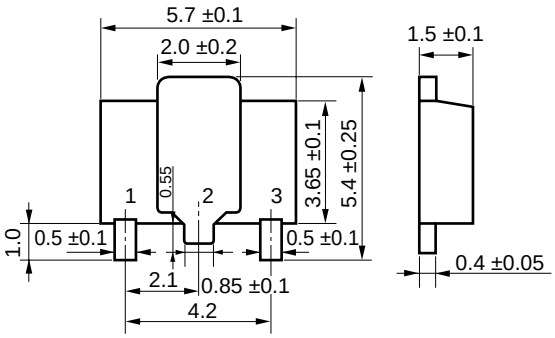
ABSOLUTE MAXIMUM RATINGS (T_A = +25 ˚C)

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)	$I_{D(pulse)}$	±5.0*	A
Total Power Dissipation	P_T	2.0**	W
Channel Temperature	T_{ch}	150	℃
Storage Temperature	T_{stg}	–55 to +150	℃

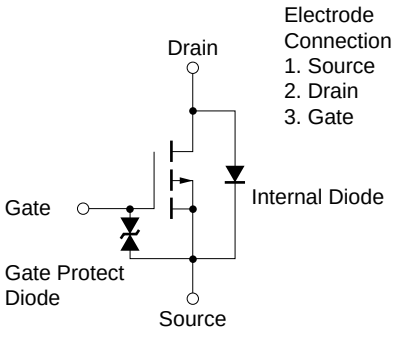
* PW ≤ 10 ms, Duty Cycle ≤ 1 %

** Mounted on ceramic board of 7.5 cm² × 0.7 mm

Package Drawings (unit : mm)



Equivalent Circuit



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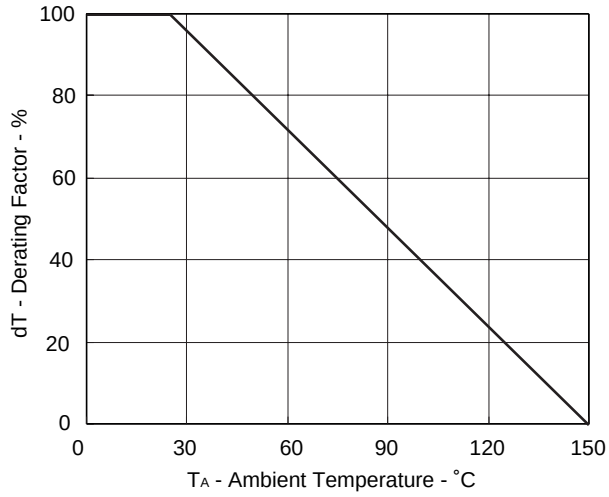
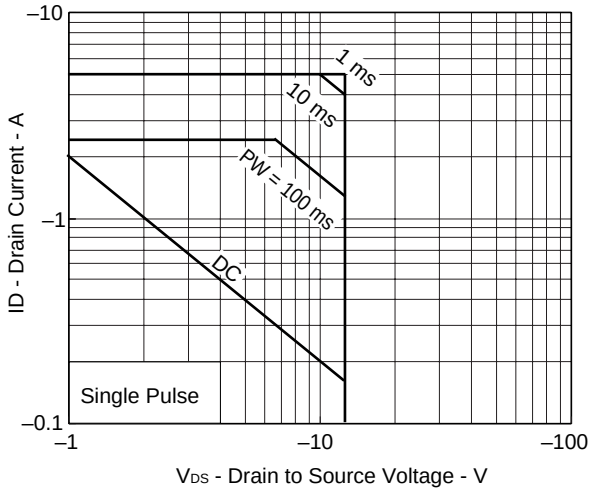
ELECTRICAL SPECIFICATIONS (T_A = +25 °C)

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

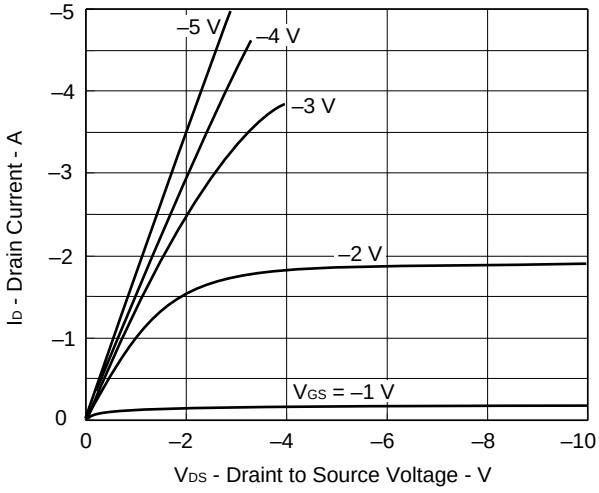
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



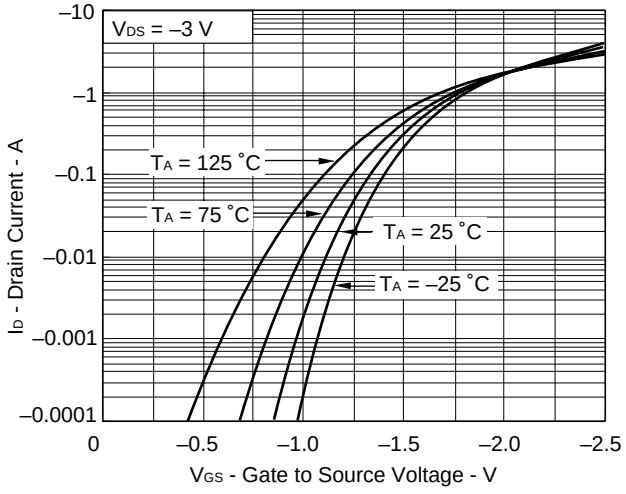
FORWARD BIAS SAFE OPERATING AREA



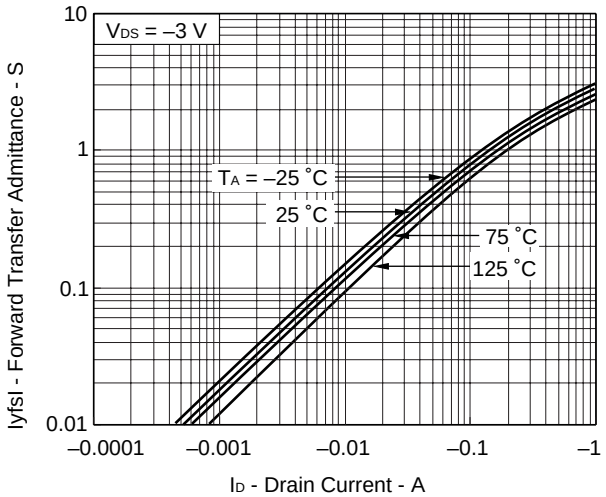
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



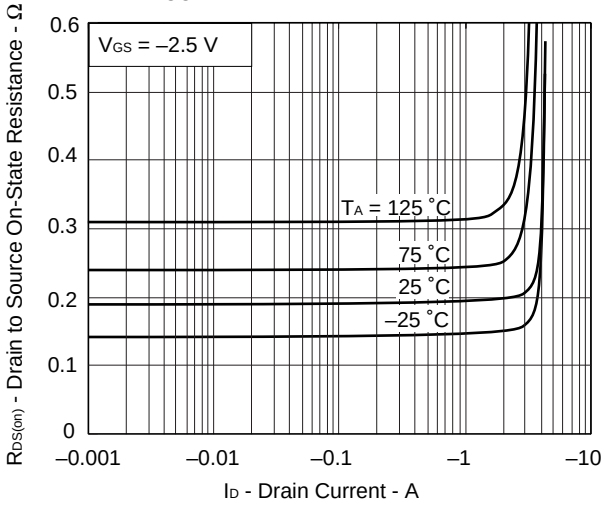
TRANSFER CHARACTERISTICS



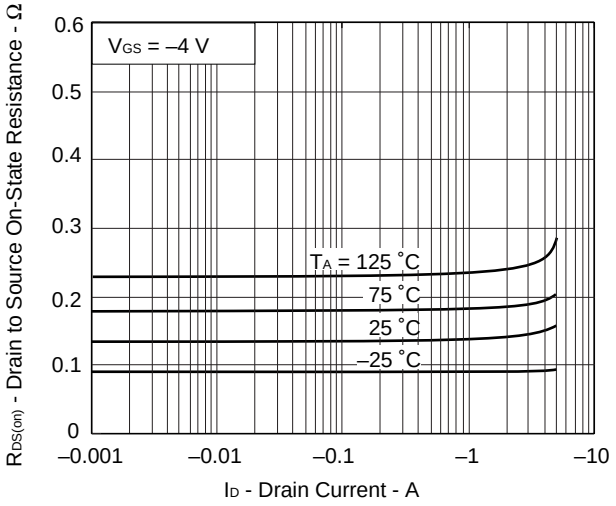
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



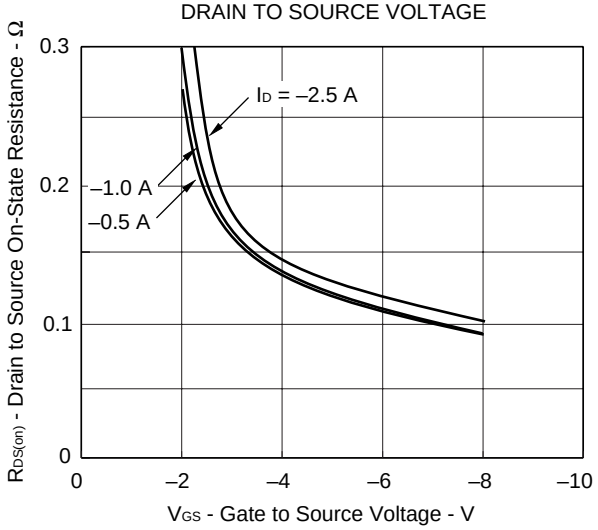
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



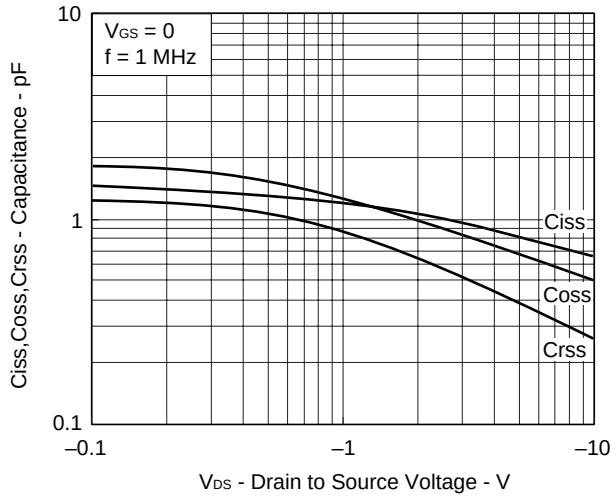
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



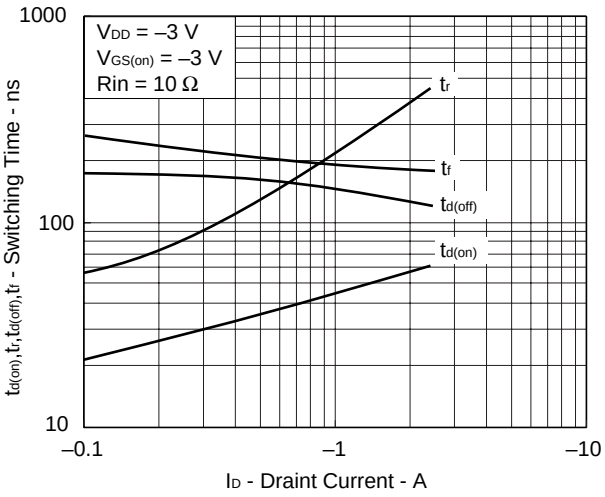
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



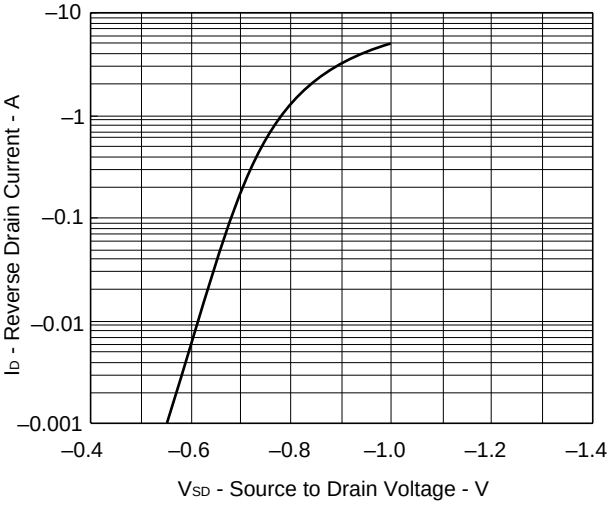
CAPACITANCE vs.
DRAIN TO SOURCE VOLTAGE



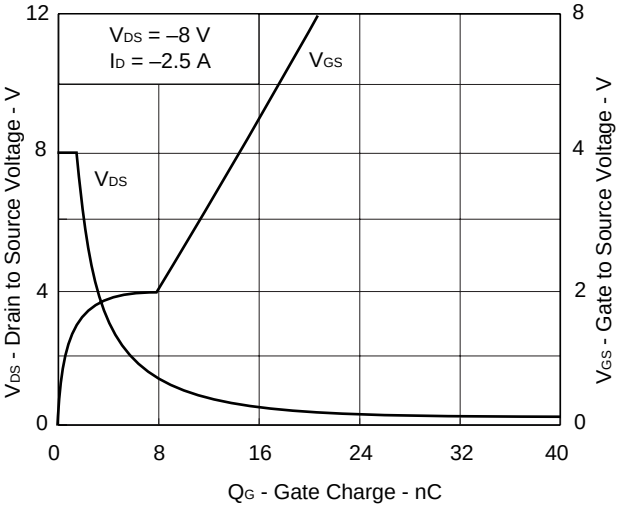
SWITCHING CHARACTERISTICS



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