

P-CHANNEL MOS FIELD EFFECT TRANSISTOR
FOR SWITCHING

DESCRIPTION

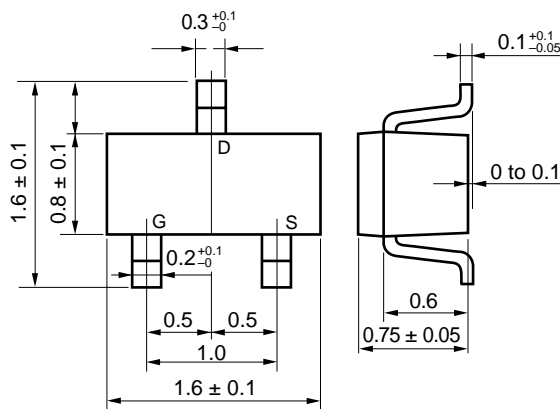
The 2SJ648 is a switching device which can be driven directly by a 2.5 V power source.

The 2SJ648 features a low on-state resistance and excellent switching characteristics, and is suitable for applications such as power switch of portable machine and so on.

FEATURES

- 2.5 V drive available
- Low on-state resistance
 $R_{DS(on)1} = 1.45 \Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -0.20 \text{ A)}$
 $R_{DS(on)2} = 1.55 \Omega \text{ MAX. (} V_{GS} = -4.0 \text{ V, } I_D = -0.20 \text{ A)}$
 $R_{DS(on)3} = 2.98 \Omega \text{ MAX. (} V_{GS} = -2.5 \text{ V, } I_D = -0.15 \text{ A)}$

PACKAGE DRAWING (Unit: mm)



ORDERING INFORMATION

PART NUMBER	PACKAGE
2SJ648	SC-75 (USM)

Remark Marking: H1

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage (V _{GS} = 0 V)	V _{DSS}	-20	V
Gate to Source Voltage (V _{DS} = 0 V)	V _{GSS}	±12	V
Drain Current (DC) (T _A = 25°C)	I _{D(DC)}	±0.4	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	±1.6	A
Total Power Dissipation ^{Note2}	P _T	0.2	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

- Notes 1. PW ≤ 10 μs, Duty Cycle ≤ 1%
 2. Mounted on ceramic substrate of 300 mm² x 0.64 mm.

Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

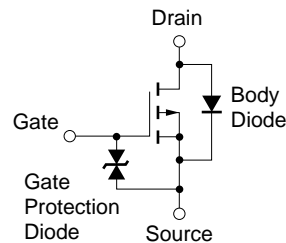
Caution This product is electrostatic-sensitive device due to low ESD capability and should be handled with caution for electrostatic discharge.

V_{ESD} = ±100 V TYP. (C = 200 pF, R = 0 Ω, Single pulse)

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EQUIVALENT CIRCUIT

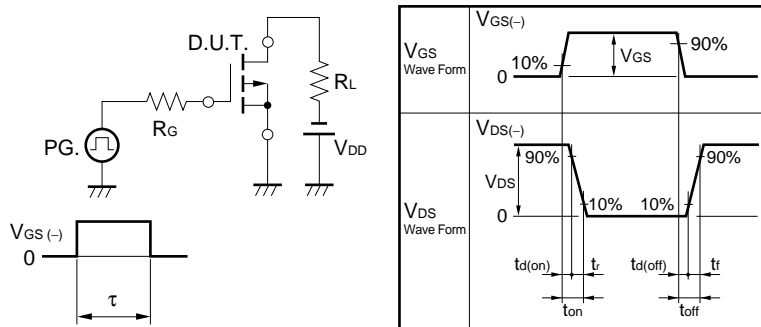


ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -20.0 V, V _{GS} = 0 V			-1.0	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±12 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage ^{Note}	V _{GS(off)}	V _{DS} = -10.0 V, I _D = -1.0 mA	-0.8	-1.3	-1.8	V
Forward Transfer Admittance ^{Note}	y _{fs}	V _{DS} = -10.0 V, I _D = -0.20 A	0.2	0.6		S
Drain to Source On-state Resistance ^{Note}	R _{DS(on)1}	V _{GS} = -4.5 V, I _D = -0.20 A		1.17	1.45	Ω
	R _{DS(on)2}	V _{GS} = -4.0 V, I _D = -0.20 A		1.25	1.55	Ω
	R _{DS(on)3}	V _{GS} = -2.5 V, I _D = -0.15 A		2.25	2.98	Ω
Input Capacitance	C _{iss}	V _{DS} = -10.0 V		29		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		15		pF
Reverse Transfer Capacitance	C _{rss}	f = 1.0 MHz		3		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = -10.0 V, I _D = -0.20 A		23		ns
Rise Time	t _r	V _{GS} = -4.0 V		39		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		50		ns
Fall Time	t _f			33		ns
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 0.40 A, V _{GS} = 0 V		0.93		V

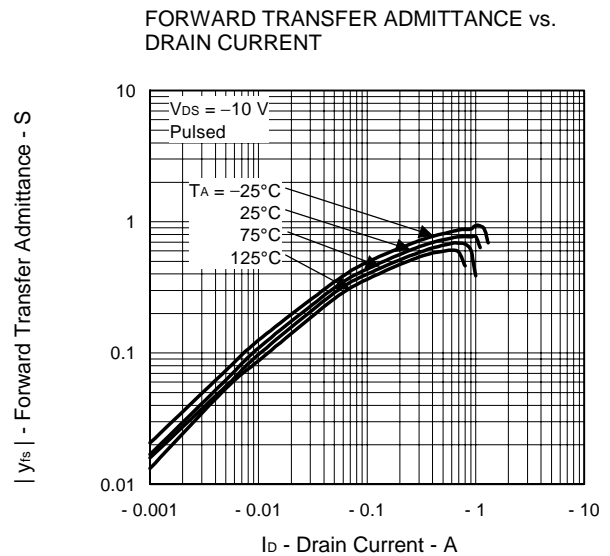
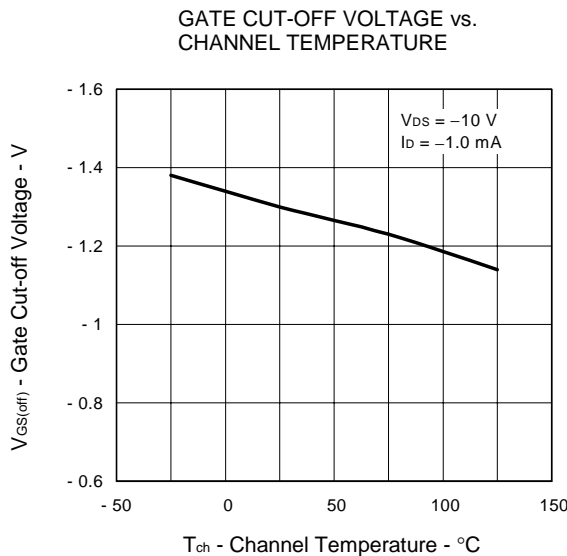
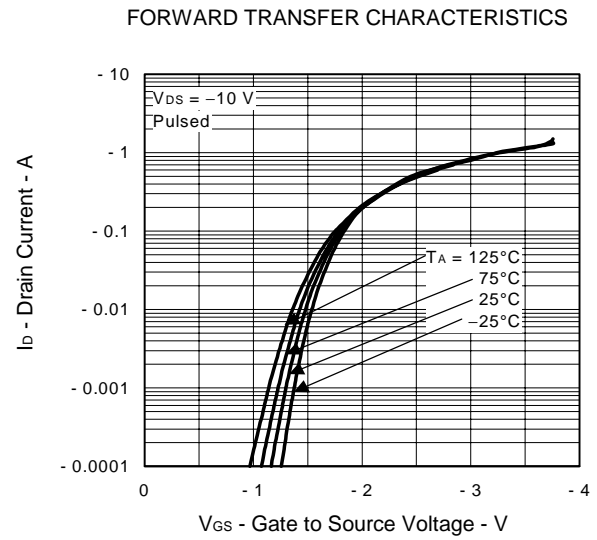
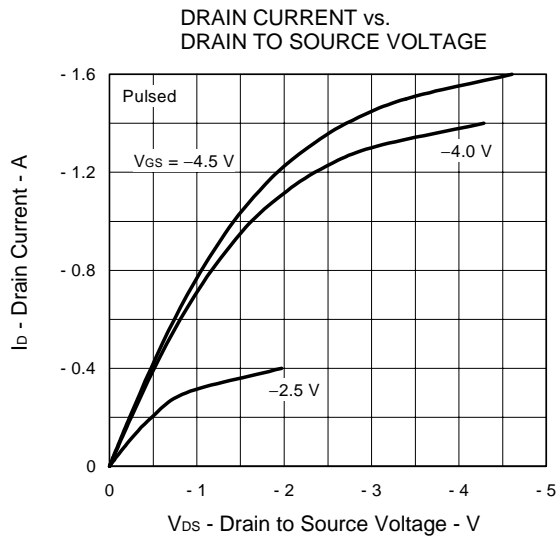
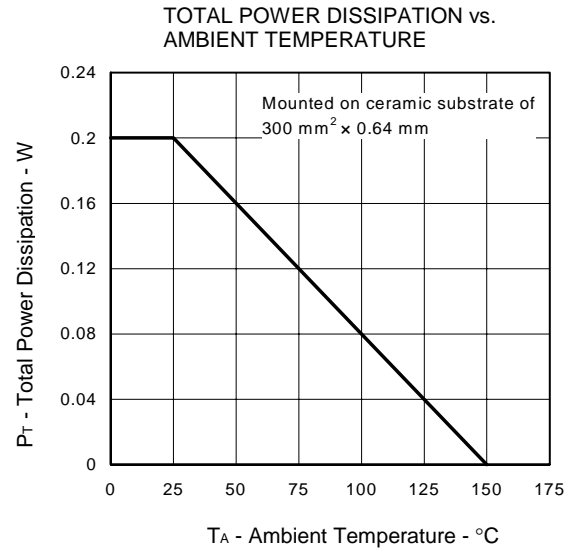
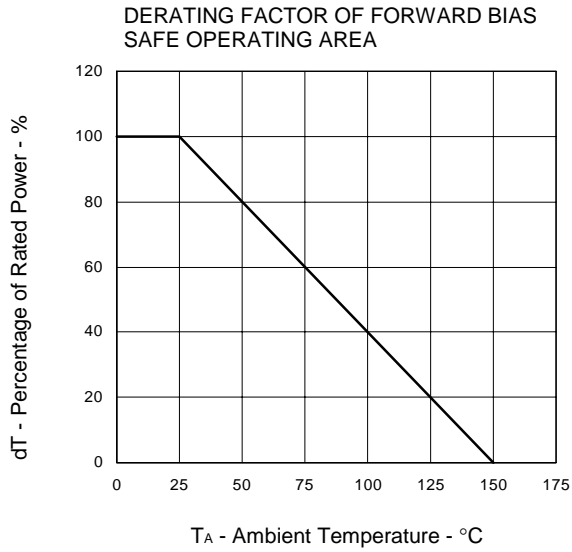
Note Pulsed PW≤350 μs, Duty Cycle≤2%

TEST CIRCUIT SWITCHING TIME

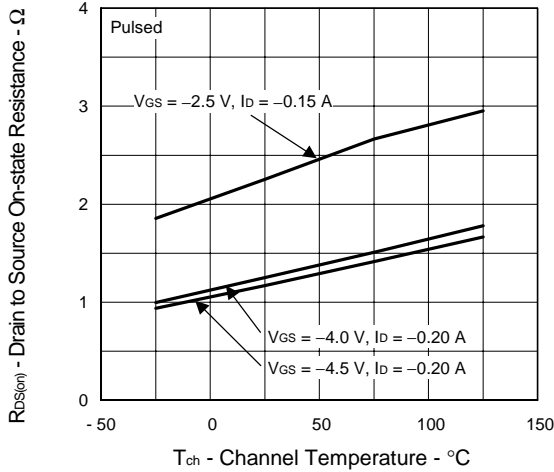


τ = 1 μs
Duty Cycle ≤ 1%

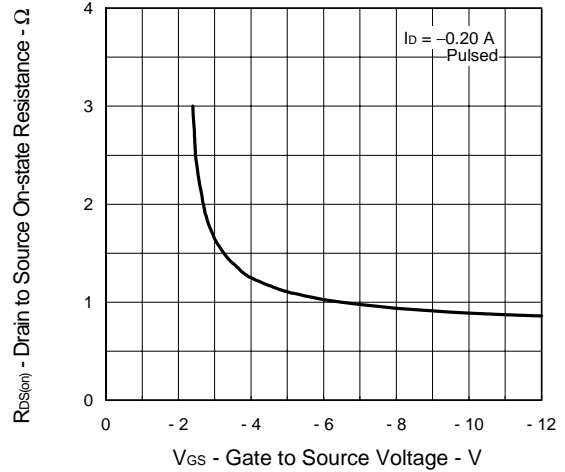
TYPICAL CHARACTERISTICS (T_A = 25°C)



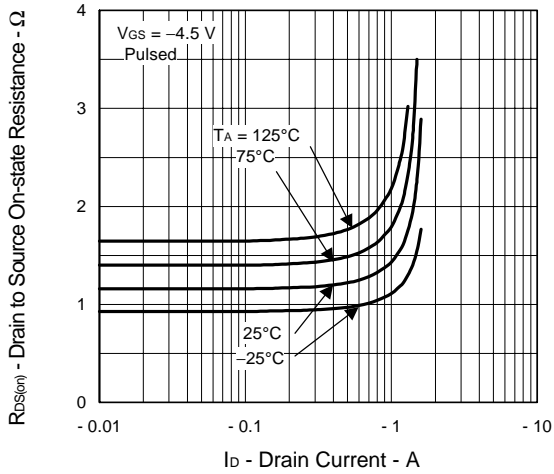
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



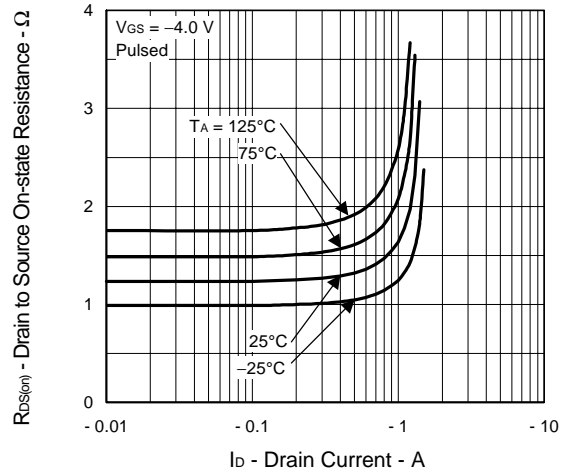
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



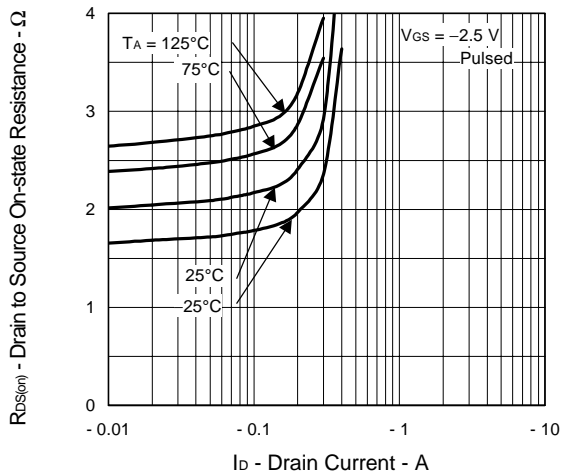
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



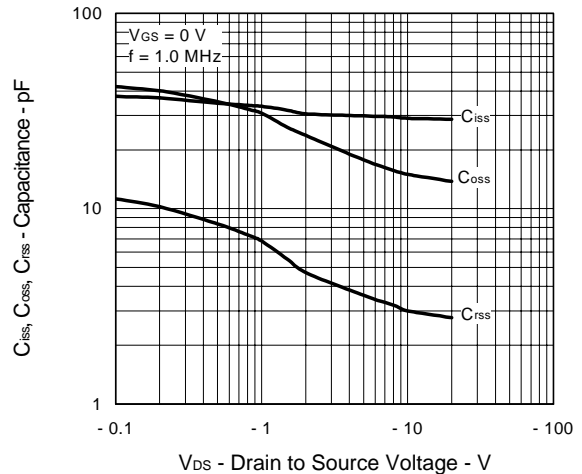
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT

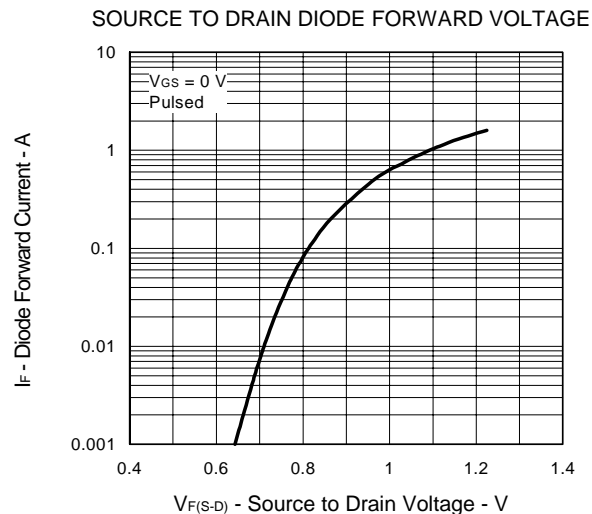
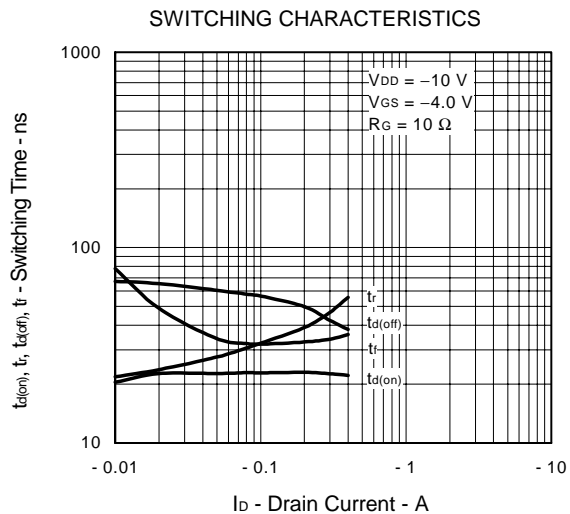


DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE





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