

MOS FIELD EFFECT POWER TRANSISTORS 2SJ327, 2SJ327-Z

SWITCHING P-CHANNEL POWER MOS FET INDUSTRIAL USE

DESCRIPTION

The 2SJ327 is P-channel MOS Field Effect Transistor designed for solenoid, motor and lamp driver.

FEATURES

- Low On-state Resistance
 $R_{DS(on)} = 0.13 \Omega$ TYP. ($V_{GS} = -10 V, I_D = -2 A$)
 $R_{DS(on)} = 0.21 \Omega$ TYP. ($V_{GS} = -4 V, I_D = -1.6 A$)
- Low C_{iss} $C_{iss} = 750 pF$ TYP.
- Built-in G-S Gate Protection Diode

QUALITY GRADE

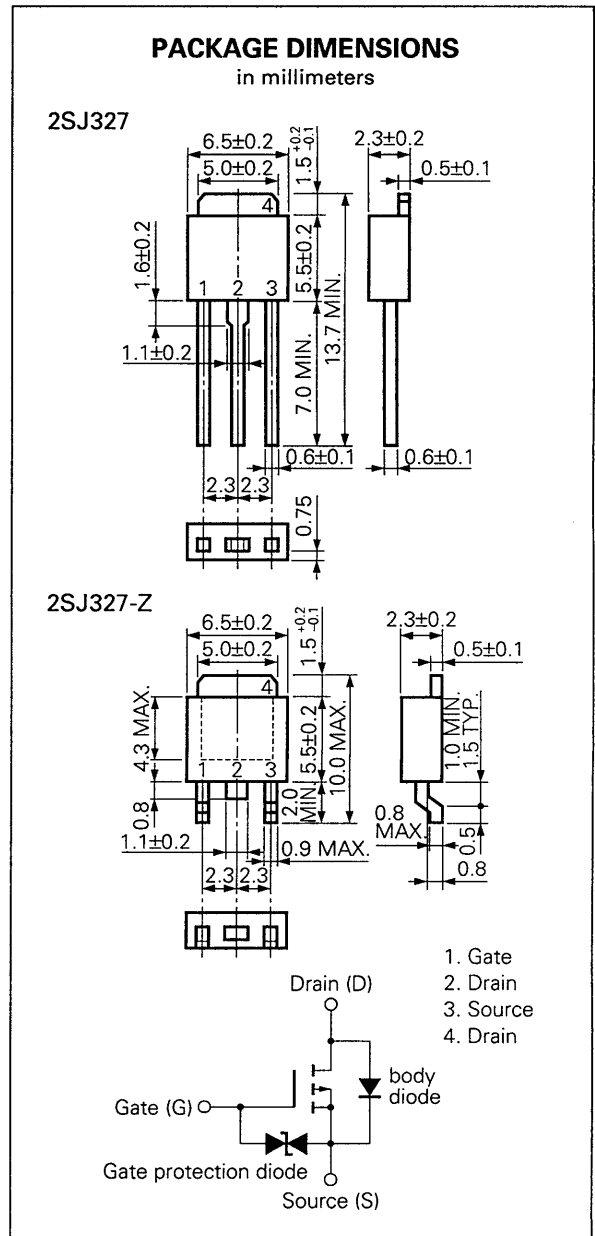
Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ C$)

Drain to Source Voltage	V_{DSS}	-60	V
Gate to Source Voltage (AC)	V_{GSS}	∓ 20	V
Gate to Source Voltage (DC)	V_{GSS}	-20, +10	V
Drain Current (DC)	$I_{D(DC)}$	∓ 4.0	A
Drain Current (pulse)	$I_{D(pulse)^*}$	∓ 16	A
Total Power Dissipation ($T_c = 25^\circ C$)	P_{T1}	20	W
Total Power Dissipation ($T_a = 25^\circ C$)	P_{T2}	1.0	W
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature	T_{stg}	-55 to +150	$^\circ C$

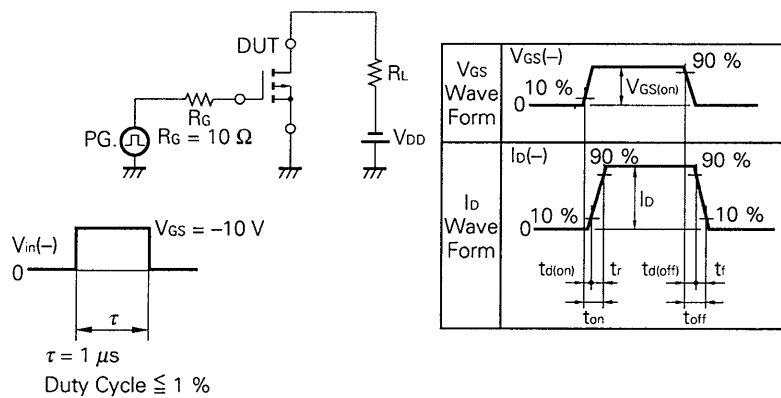
* $PW \leq 10 \mu s$, Duty Cycle $\leq 1\%$



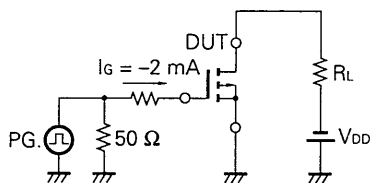
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	R _{DS(on)}		0.13	0.17	Ω	V _{GS} = -10 V, I _D = -2.0 A
Drain to Source On-state Resistance	R _{DS(on)}		0.21	0.34	Ω	V _{GS} = -4 V, I _D = -1.6 A
Gate to Source Cutoff Voltage	V _{GS(off)}	-1.0	-1.5	-2.0	V	V _{DS} = -10 V, I _D = -1 mA
Forward Transfer Admittance	y _{fs}	3.0	3.8		S	V _{DS} = -10 V, I _D = -2.0 A
Drain Leakage Current	I _{DSS}			-10	μA	V _{DS} = -60 V, V _{GS} = 0
Gate to Source Leakage Current	I _{GSS}			±10	μA	V _{GS} = ±16 V, V _{DS} = 0
Input Capacitance	C _{iss}		750		pF	V _{DS} = -10 V V _{GS} = 0 f = 1 MHz
Output Capacitance	C _{oss}		410		pF	
Reverse Transfer Capacitance	C _{rss}		165		pF	
Turn-On Delay Time	t _{d(on)}		10		ns	V _{GS(on)} = -10 V V _{DD} = -30 V I _D = -2.0 A, R _G = 10 Ω R _L = 15 Ω
Rise Time	t _r		35		ns	
Turn-Off Delay Time	t _{d(off)}		85		ns	
Fall Time	t _f		45		ns	
Total Gate Charge	Q _G		27		nC	V _{GS} = -10 V I _D = -4.0 A V _{DD} = -48 V
Gate to Source Charge	Q _{GS}		2		nC	
Gate to Drain Charge	Q _{GD}		11		nC	
Body Diode Forward Voltage	V _F		0.9		V	I _F = 4.0 A, V _{GS} = 0
Reverse Recovery Time	t _{rr}		85		ns	I _F = 4.0 A, V _{GS} = 0
Reverse Recovery Charge	Q _{rr}		130		nC	di/dt = 50 A/μs

Test Circuit 1: Switching Time

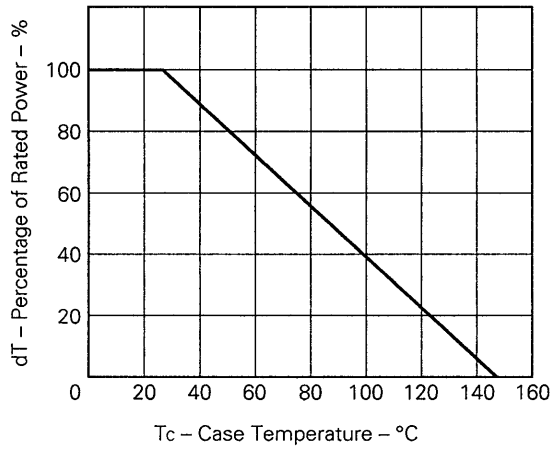


Test Circuit 2: Gate Charge

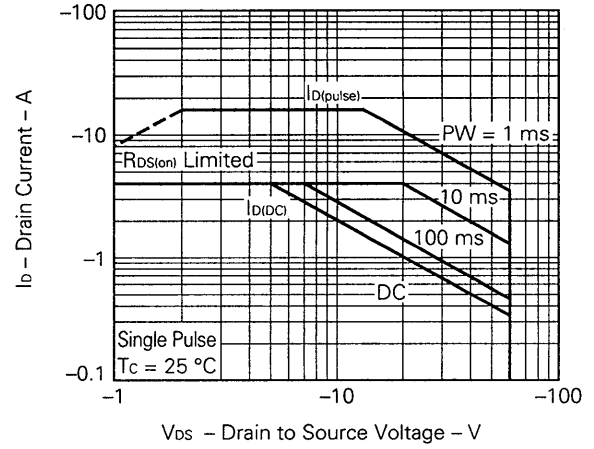


ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

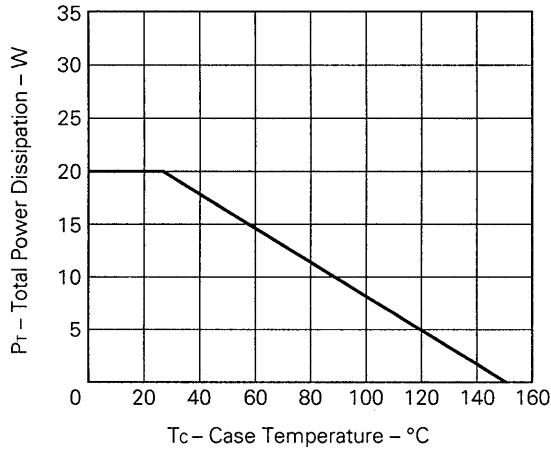
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



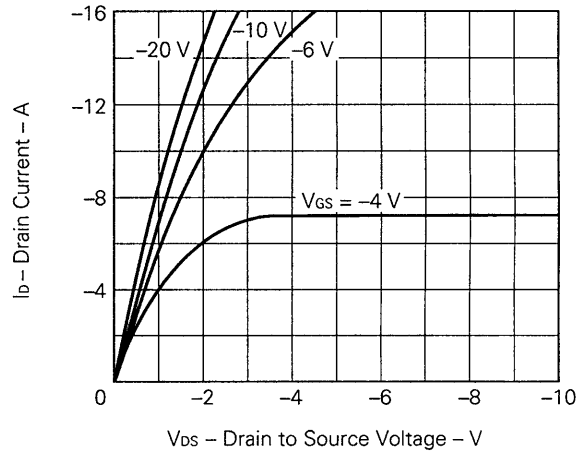
FORWARD BIAS SAFE OPERATING AREA



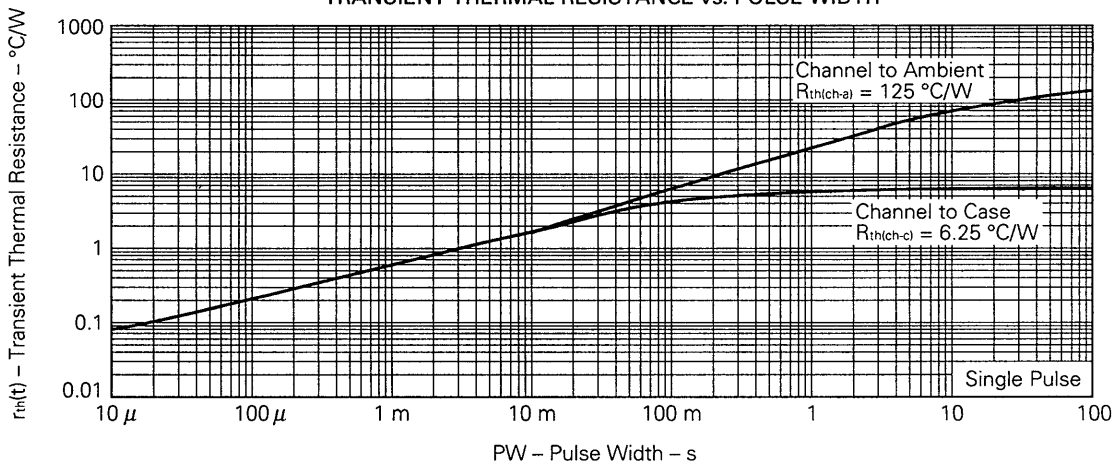
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE

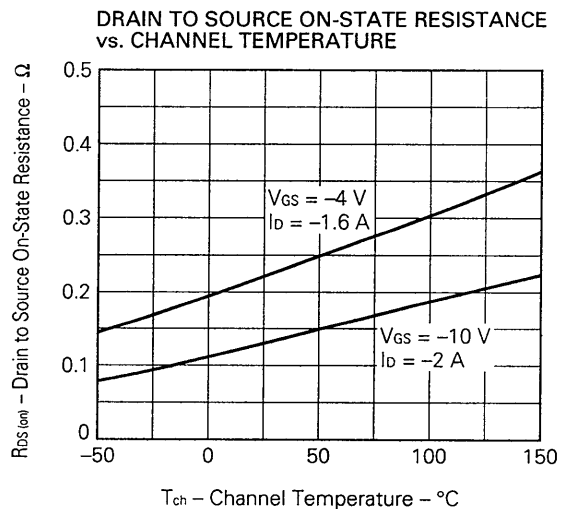
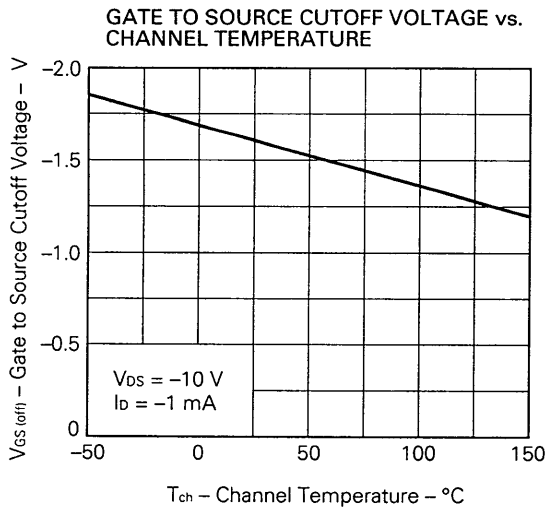
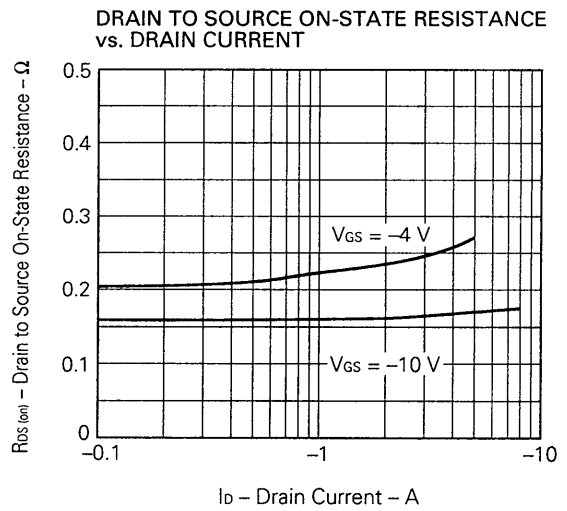
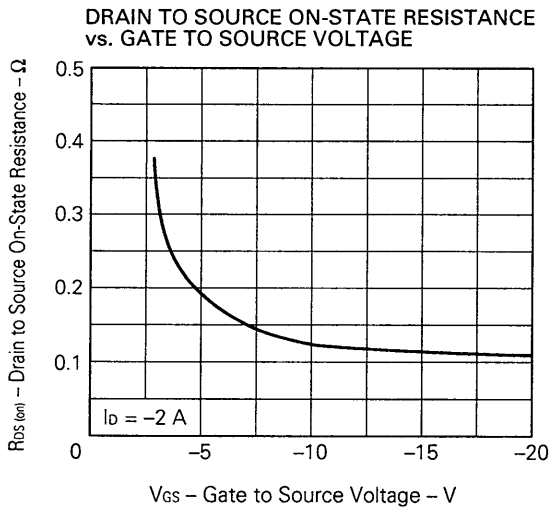
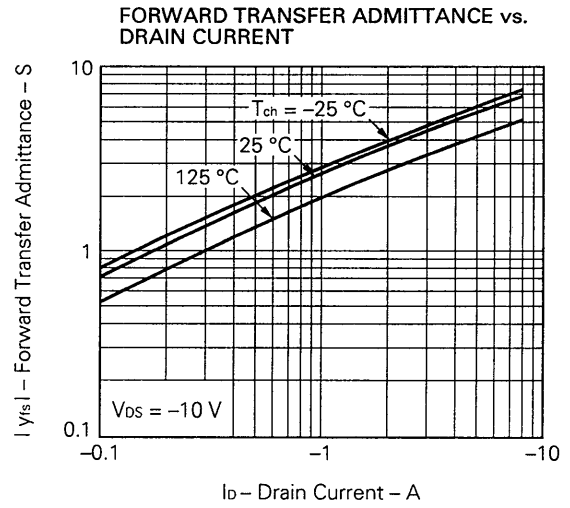
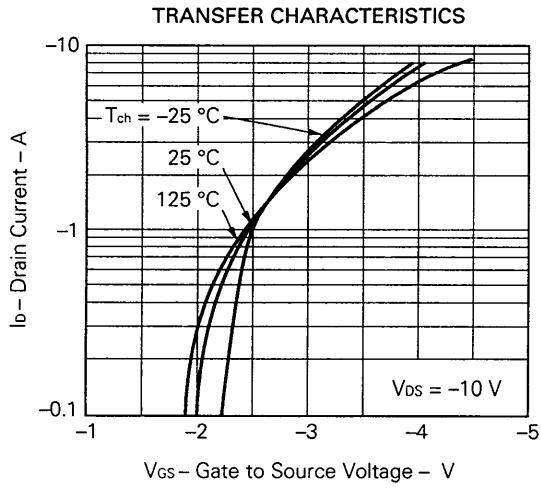


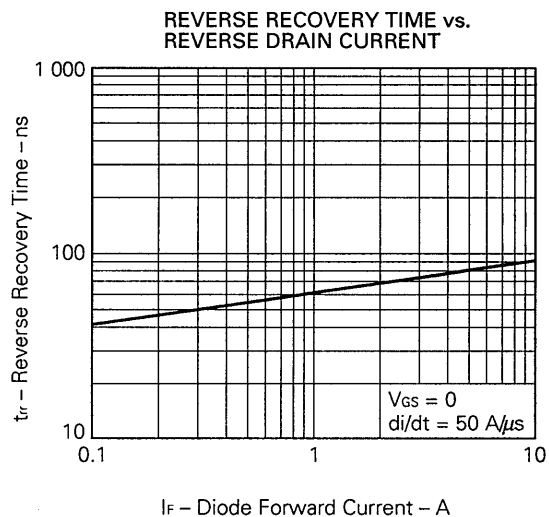
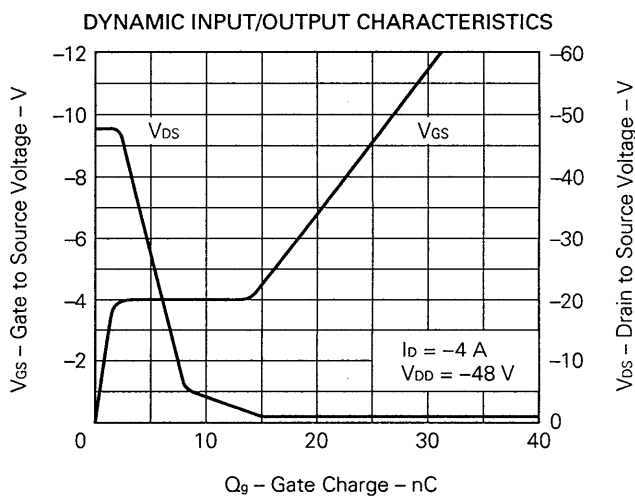
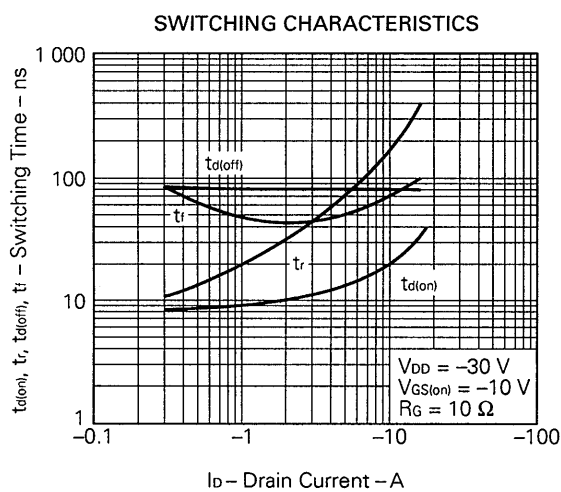
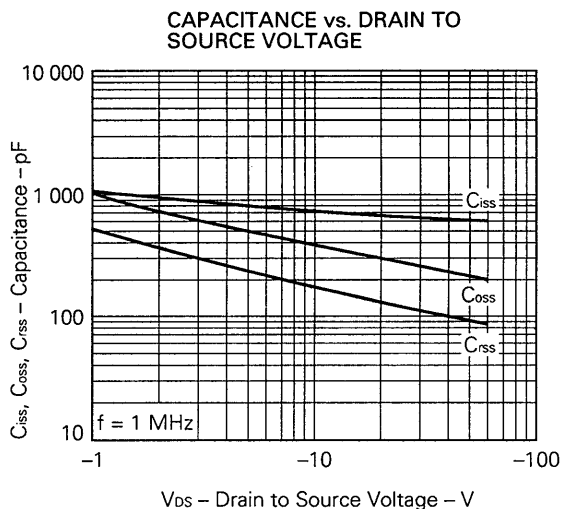
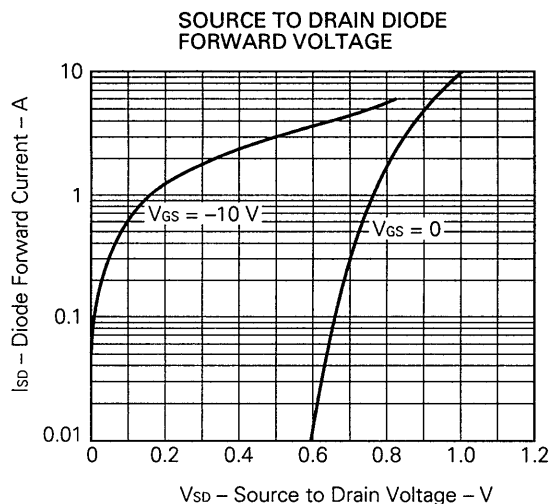
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH







Reference

Application note name	No.
Safe operating area of Power MOS FET.	TEA-1034
Application circuit using Power MOS FET.	TEA-1035
Quality control of NEC semiconductors devices.	TEI-1202
Quality control guide of semiconductors devices.	MEI-1202
Assembly manual of semiconductors devices.	IEI-1207

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