Ordering number : ENN6671

P-Channel Silicon MOSFET

2SJ609

DC / DC Converter Applications

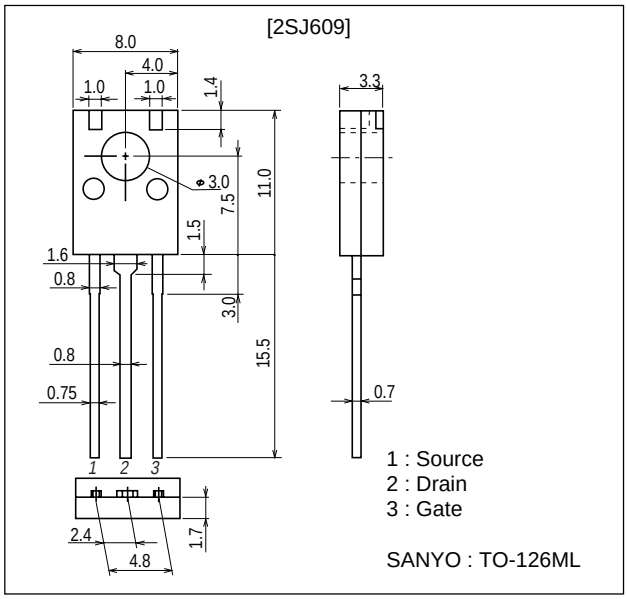
Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.

Package Dimensions

unit : mm

2190



Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−60	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		−5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−20	A
Allowable Power Dissipation	P_D		1	W
		Tc=25°C	10	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=−1mA, V_{GS}=0	−60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−60V, V_{GS}=0			−10	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0			±10	μA

Continued on next page.

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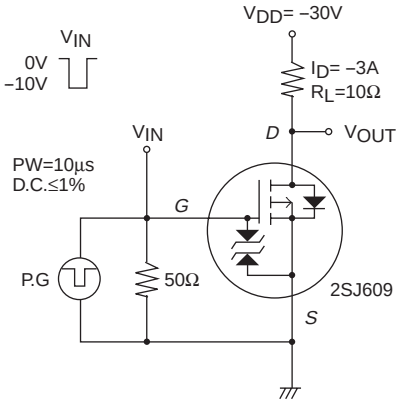
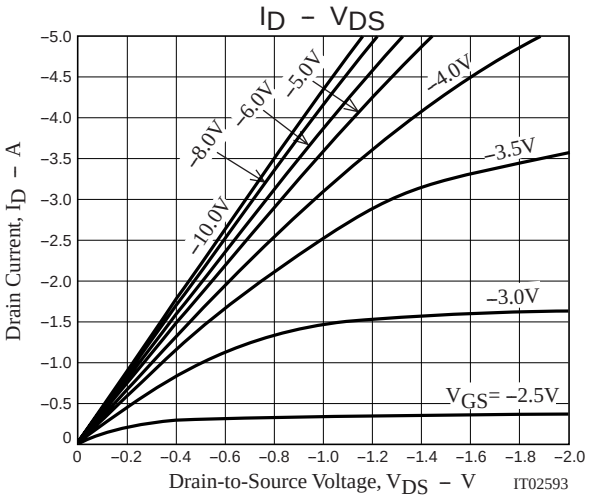
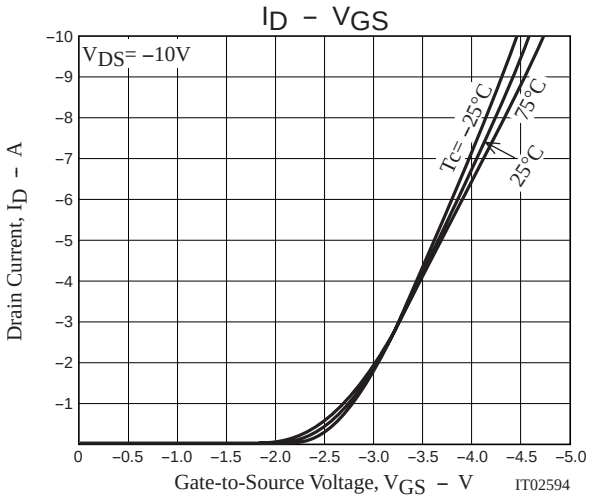
Continued from preceding page.

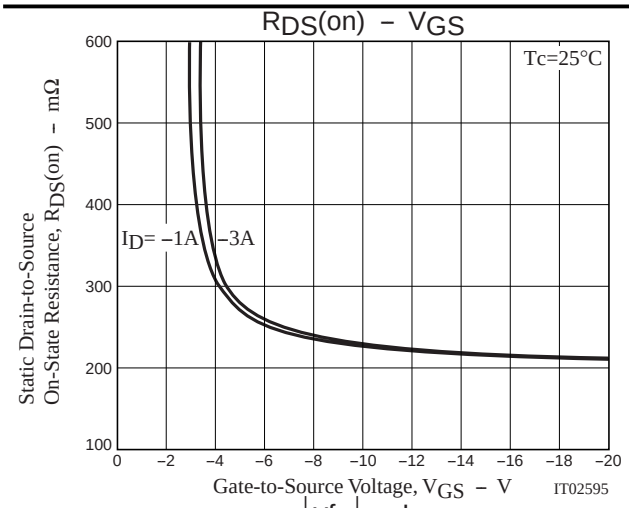
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Cutoff Voltage	V_{GS}(off)	V_{DS}=−10V, I_D=−1mA	−1.0		−2.4	V
Forward Transfer Admittance	|yfs|	V_{DS}=−10V, I_D=−3A	3.2	4.6		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=−3A, V_{GS}=−10V		225	295	mΩ
	R_{DS}(on)2	I_D=−1A, V_{GS}=−4V		305	425	mΩ
Input Capacitance	Ciss	V_{DS}=−20V, f=1MHz		350		pF
Output Capacitance	Coss	V_{DS}=−20V, f=1MHz		90		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−20V, f=1MHz		25		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit		8		ns
Rise Time	t_r	See specified Test Circuit		15		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit		37		ns
Fall Time	t_f	See specified Test Circuit		28		ns
Total Gate Charge	Qg	V_{DS}=−10V, V_{GS}=−10V, I_D=−5A		12		nC
Gate-to-Source Charge	Qgs	V_{DS}=−10V, V_{GS}=−10V, I_D=−5A		1.7		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−10V, V_{GS}=−10V, I_D=−5A		2.9		nC
Diode Forward Voltage	V_{SD}	I_S=−5A, V_{GS}=0		−0.91	−1.2	V

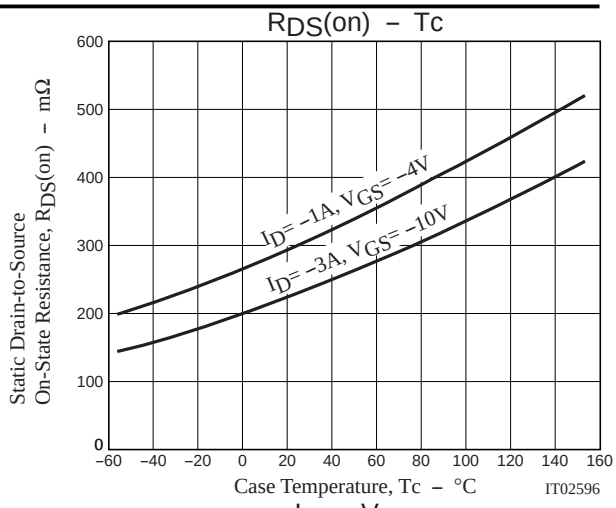
Switching Time Test Circuit

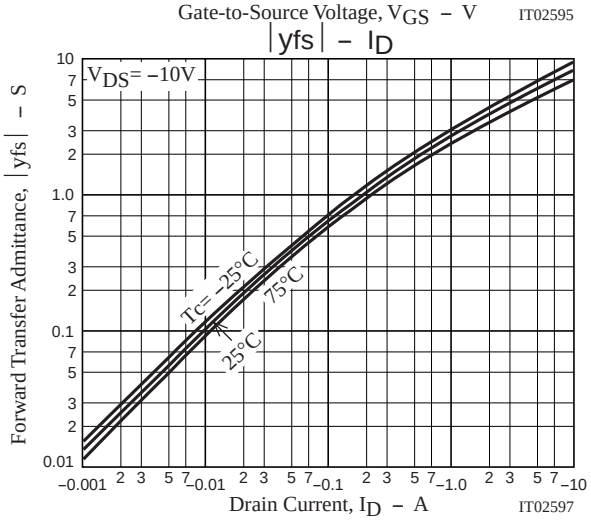


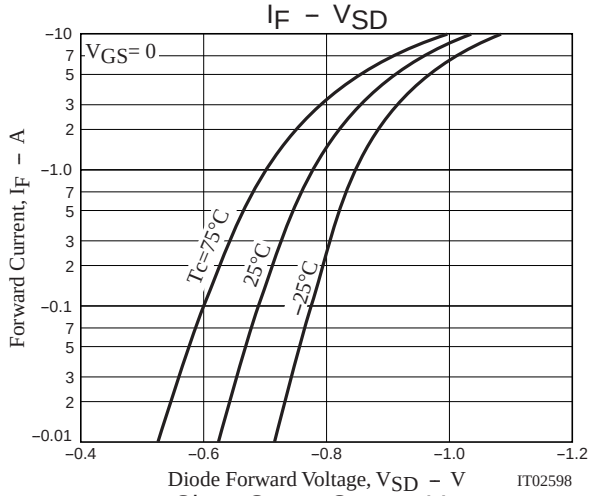


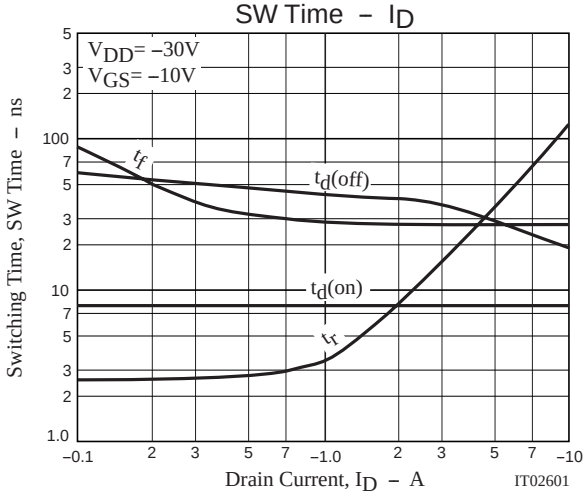


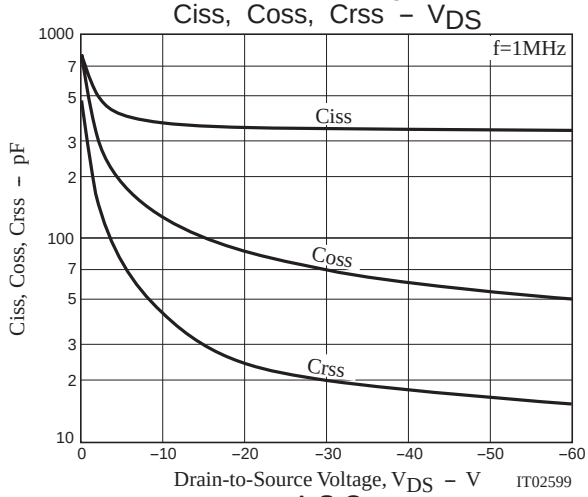

RDS(on) – VGS
Tc=25°C
ID= –1A
–3A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT02595

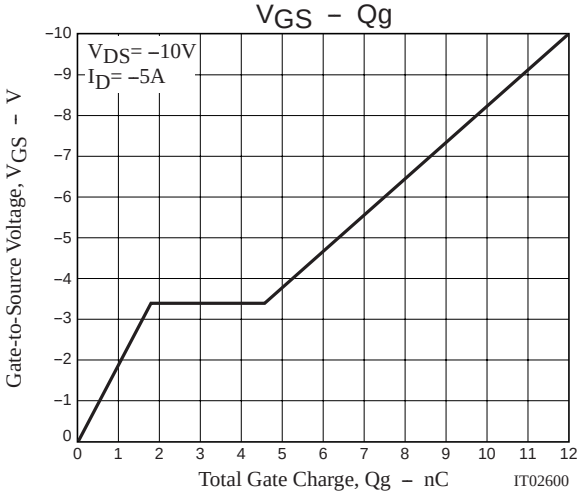

RDS(on) – Tc
ID= –1A, VGS= –4V
ID= –3A, VGS= –10V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT02596

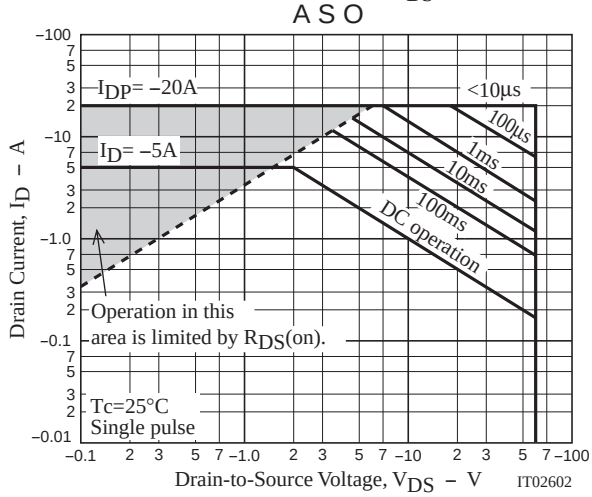

|yfs| – ID
VDS= –10V
Tc= –25°C
25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT02597


IF – VSD
VGS= 0
Tc=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT02598


SW Time – ID
VDD= –30V
VGS= –10V
tf
td(off)
td(on)
tr
Switching Time, SW Time – ns
Drain Current, ID – A
IT02601


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT02599


VGS – Qg
VDS= –10V
ID= –5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT02600


A S O
IDP= –20A
ID= –5A
<10µs
100µs
1ms
10ms
100ms
DC operation
Operation in this area is limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT02602