Ordering number : EN8584A

SANYO Semiconductors

DATA SHEET

P-Channel Silicon MOSFET

2SJ659 — General-Purpose Switching Device Applications

Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.
- Motor drive, DC / DC converter.
- Avalanche resistance guarantee.

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		−14	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−56	A
Allowable Power Dissipation	P_D		1.65	W
		Tc=25°C	40	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		85	mJ
Avalanche Current *2	I_{AV}		−14	A

Note : *1 V_{DD}=30V, L=500μH, I_{AV}=−14A

*2 L≤500μH, Single pulse

Marking : J659

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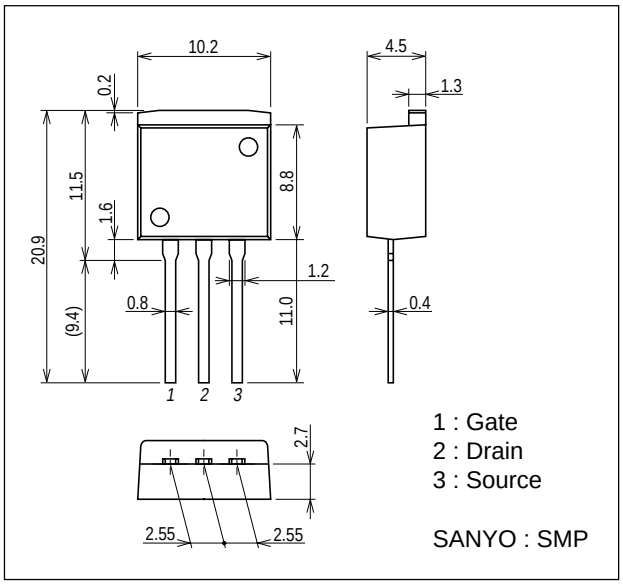
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=–1mA, V_{GS}=0V	–60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=–60V, V_{GS}=0V			–1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}= ±16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=–10V, I_D=–1mA	–1.2		–2.6	V
Forward Transfer Admittance	|yfs|	V_{DS}=–10V, I_D=–7A	7	12		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=–7A, V_{GS}=–10V		102	133	mΩ
	R_{DS}(on)2	I_D=–7A, V_{GS}=–4V		147	206	mΩ
Input Capacitance	Ciss	V_{DS}=–20V, f=1MHz		1020		pF
Output Capacitance	Coss	V_{DS}=–20V, f=1MHz		110		pF
Reverse Transfer Capacitance	Crss	V_{DS}=–20V, f=1MHz		76		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		10		ns
Rise Time	t_r	See specified Test Circuit.		180		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		80		ns
Fall Time	t_f	See specified Test Circuit.		100		ns
Total Gate Charge	Qg	V_{DS}=–30V, V_{GS}=–10V, I_D=–14A		21		nC
Gate-to-Source Charge	Qgs	V_{DS}=–30V, V_{GS}=–10V, I_D=–14A		3.8		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=–30V, V_{GS}=–10V, I_D=–14A		4.5		nC
Diode Forward Voltage	V_{SD}	I_S=–14A, V_{GS}=0V		–1.0	–1.2	V

Package Dimensions

unit : mm (typ)

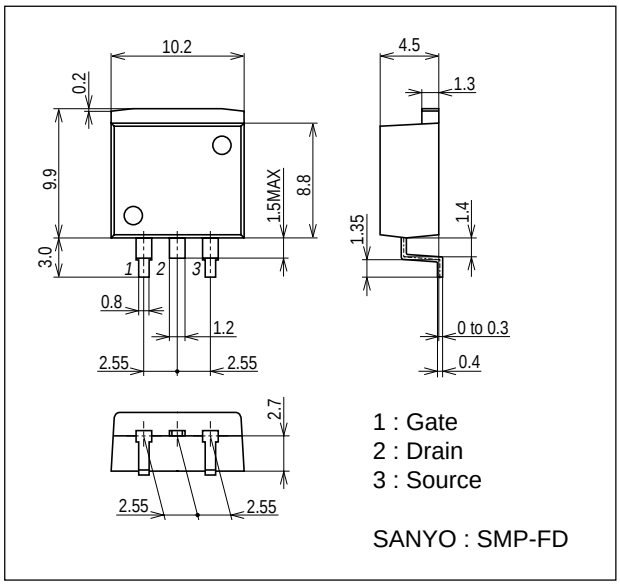
7513-002



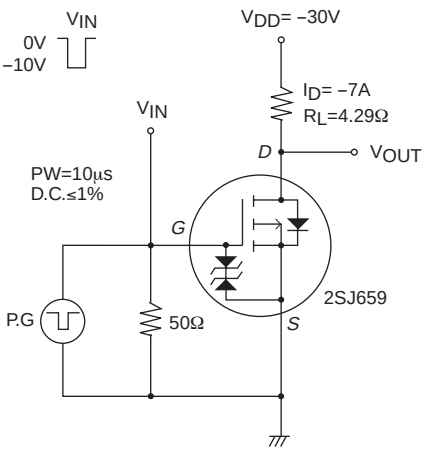
Package Dimensions

unit : mm (typ)

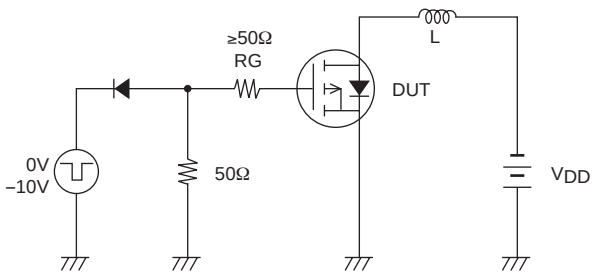
7001-003

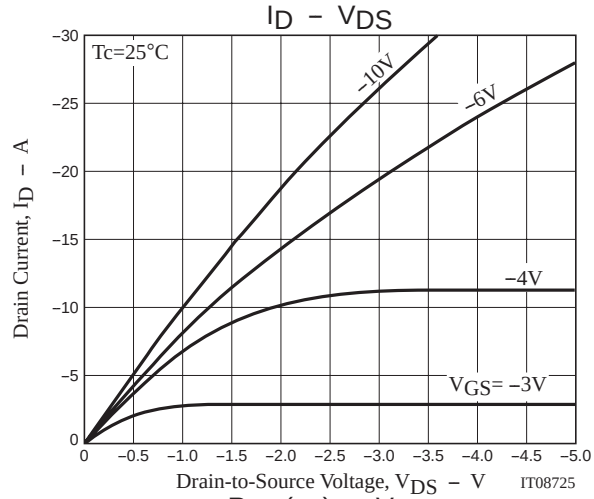


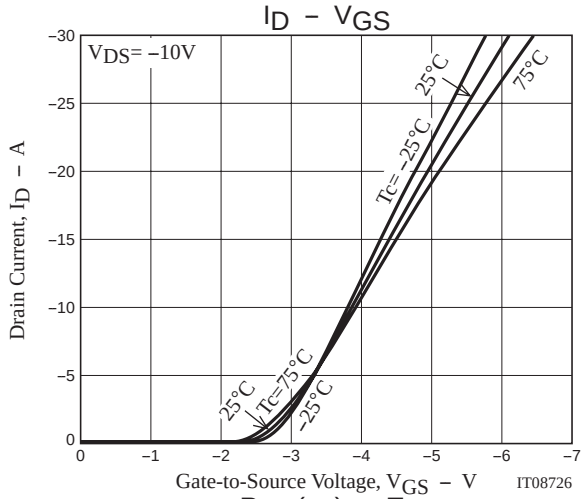
Switching Time Test Circuit

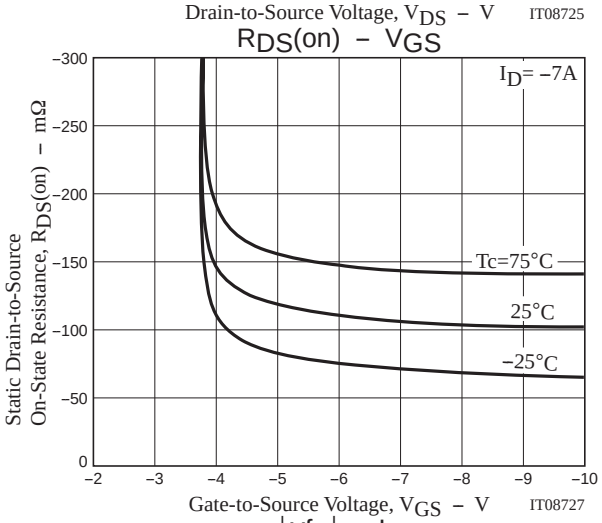


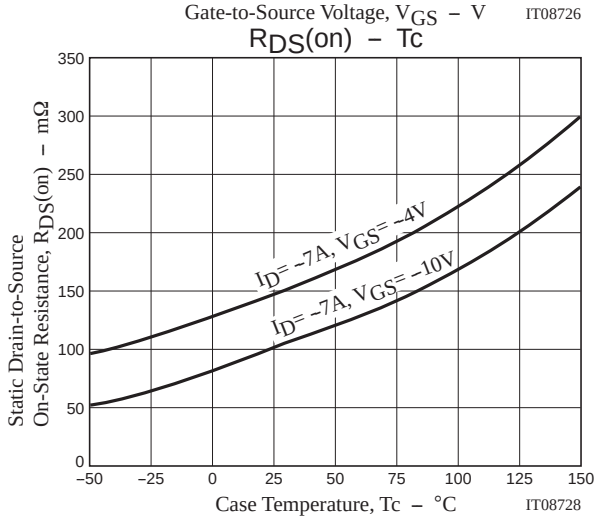
Avalanche Resistance Test Circuit

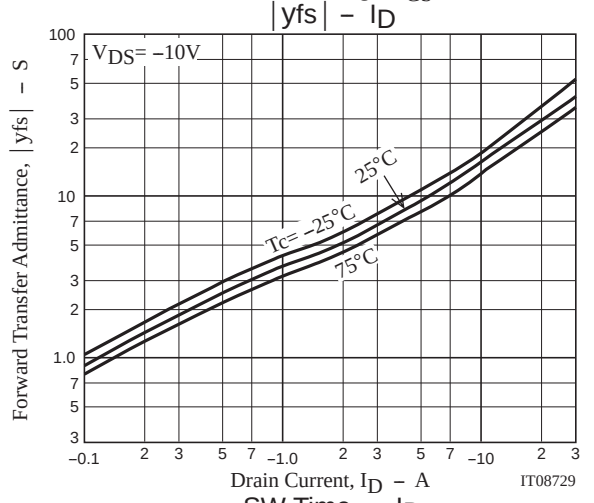


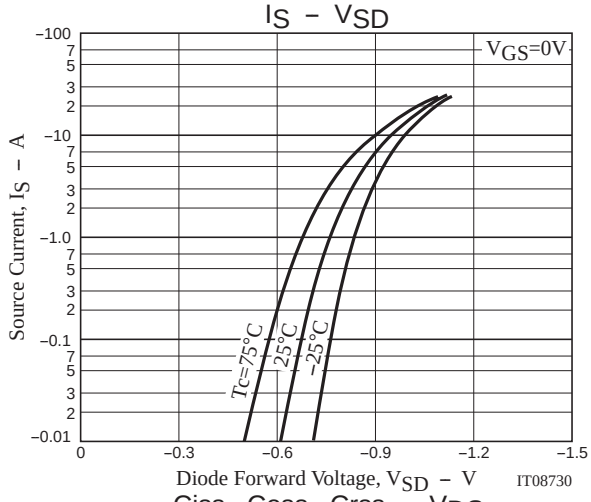

ID – VDS
Tc=25°C
–10V
–6V
–4V
VGS= –3V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT08725

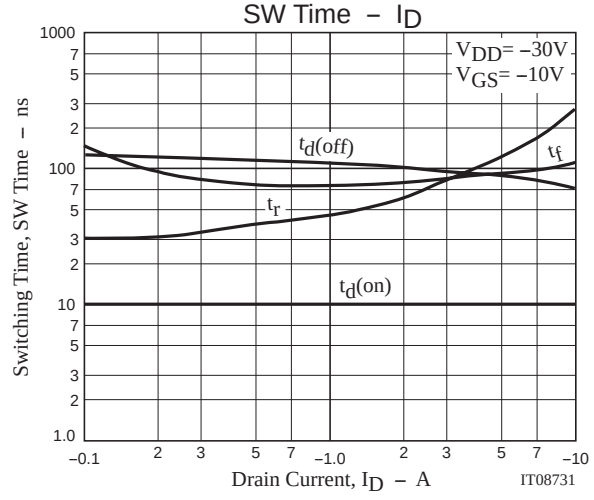

ID – VGS
VDS= –10V
25°C
75°C
Tc= –25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT08726

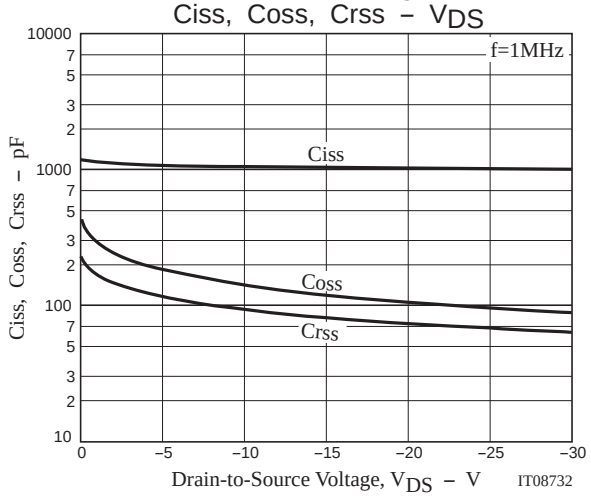

RDS(on) – VGS
ID= –7A
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT08727

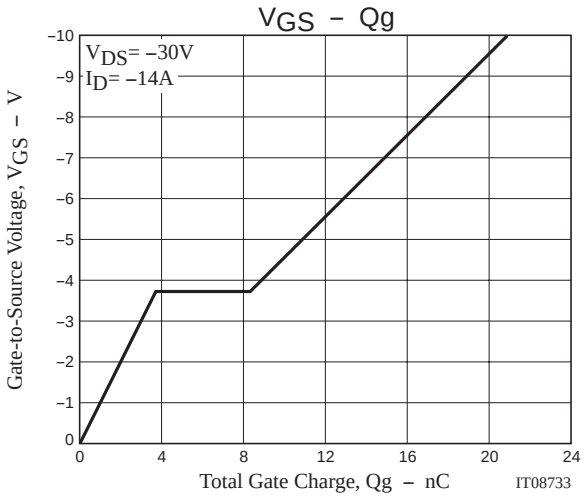

RDS(on) – Tc
ID= –7A, VGS= –4V
ID= –7A, VGS= –10V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT08728

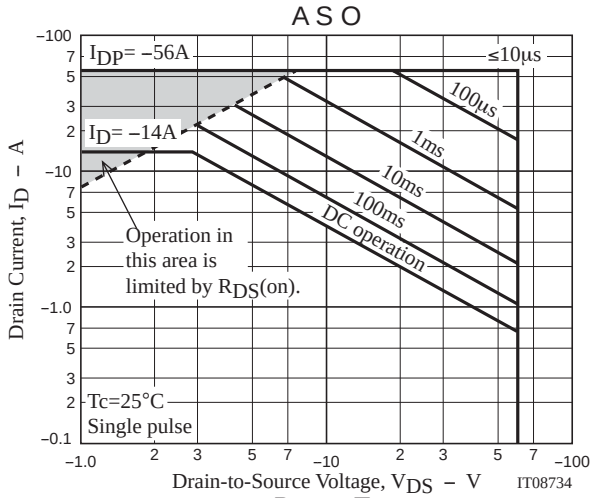

|yfs| – ID
VDS= –10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT08729

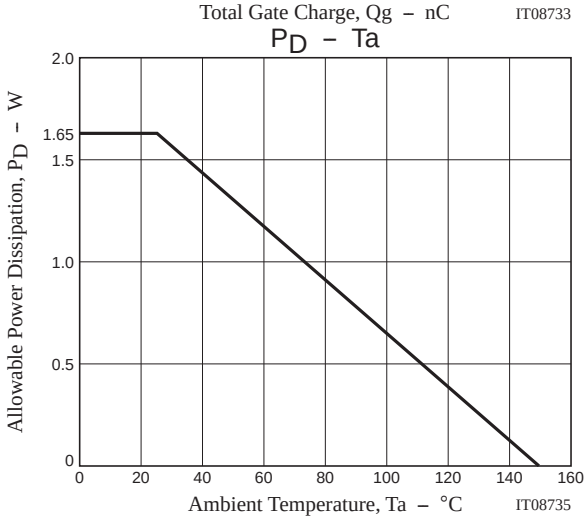

IS – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT08730

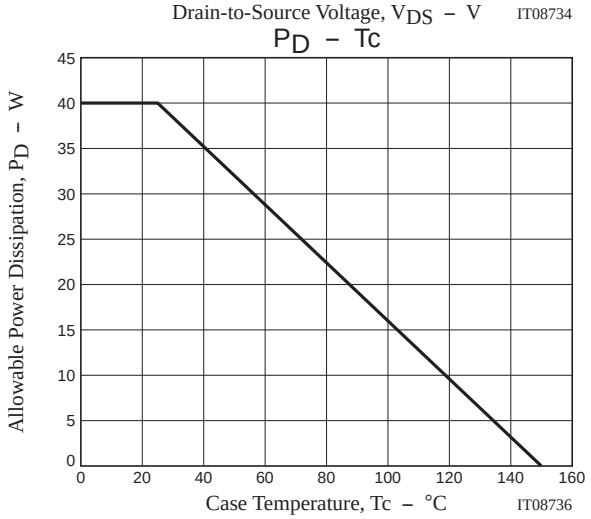

SW Time – ID
VDD= –30V
VGS= –10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT08731


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT08732









Note on usage : Since the 2SJ659 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.