Ordering number : ENN7784

SANYO Semiconductors
DATA SHEET

P-Channel Silicon MOSFET

FW156 — General-Purpose Switching Device Applications

Features

- For DC / DC converters, Motor drives, Inverters.
- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.

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		–3.5	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	–14	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1200mm²×0.8mm) 1unit, PW≤10s	2.0	W
Total Dissipation	P_T	Mounted on a ceramic board (1200mm²×0.8mm), PW≤10s	2.3	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			–1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}= ±16V, V_{DS}=0			±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=–2A	3	4.6		S
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=–2A, V_{GS}=–10V		110	145	mΩ
	$R_{DS}(on)2$	I_D=–2A, V_{GS}=–4V		150	210	mΩ
Input Capacitance	Ciss	V_{DS}=–20V, f=1MHz		990		pF
Output Capacitance	Coss	V_{DS}=–20V, f=1MHz		110		pF
Reverse Transfer Capacitance	Crss	V_{DS}=–20V, f=1MHz		76		pF

Marking : W156

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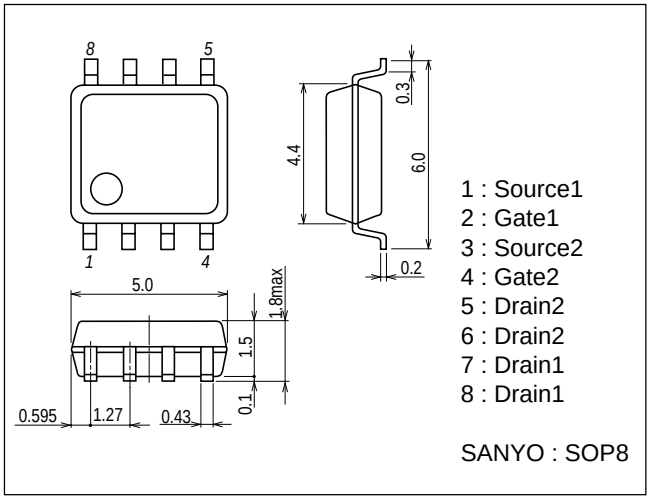
Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		12		ns
Rise Time	t_{r}	See specified Test Circuit.		50		ns
Turn-OFF Delay Time	t_{d}(off)	See specified Test Circuit.		100		ns
Fall Time	t_{f}	See specified Test Circuit.		65		ns
Total Gate Charge	Qg	V_{DS}=−30V, V_{GS}=−10V, I_{D}=−3.5A		22		nC
Gate-to-Source Charge	Qgs	V_{DS}=−30V, V_{GS}=−10V, I_{D}=−3.5A		4		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−30V, V_{GS}=−10V, I_{D}=−3.5A		4		nC
Diode Forward Voltage	V_{SD}	I_{S}=−3.5A, V_{GS}=0		−0.86	−1.2	V

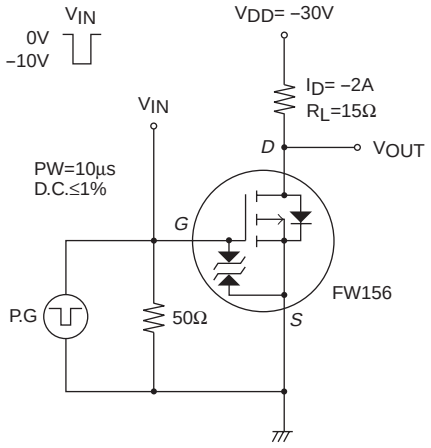
Package Dimensions

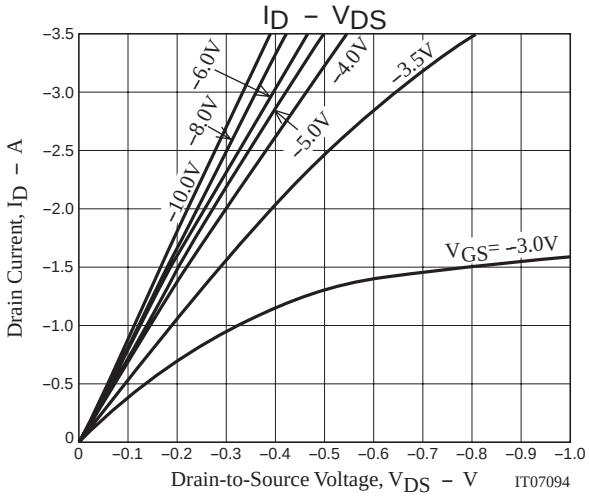
unit : mm

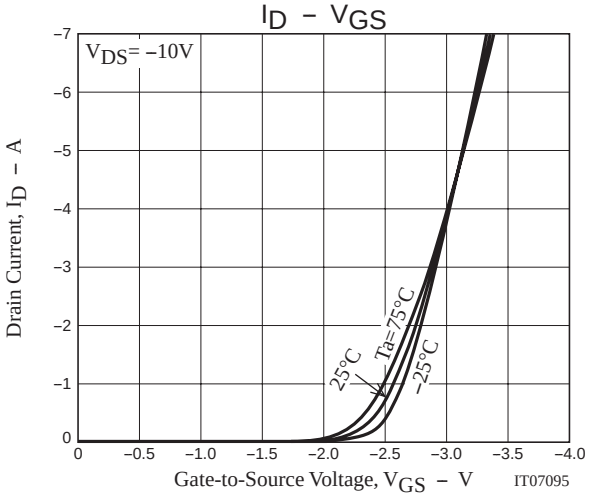
2129

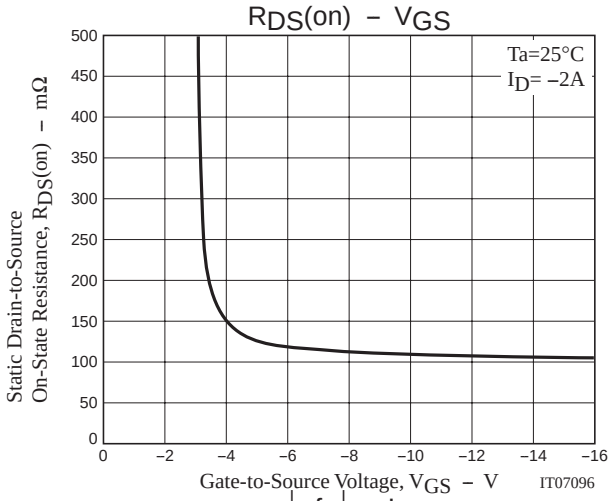


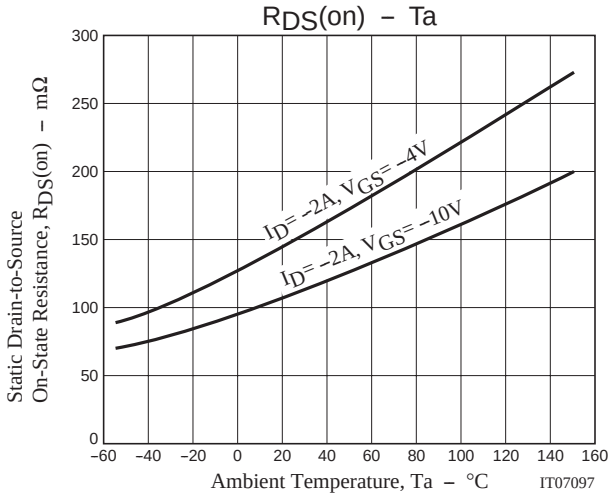
Switching Time Test Circuit

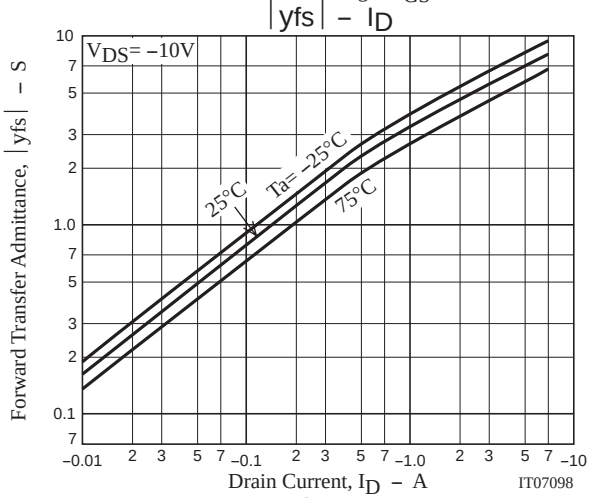


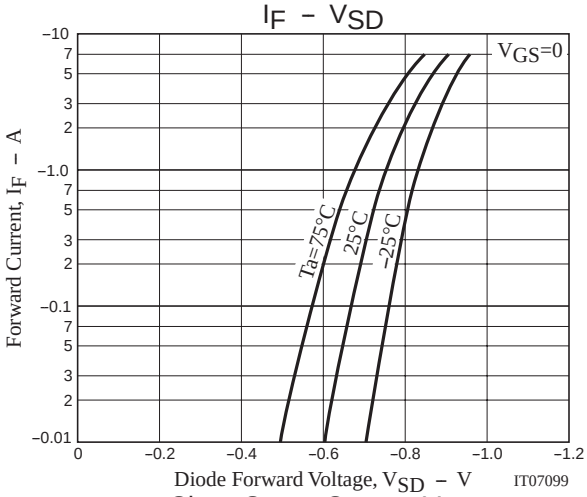


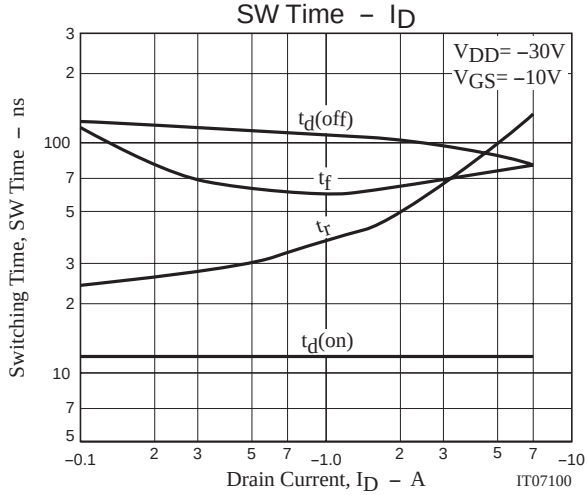


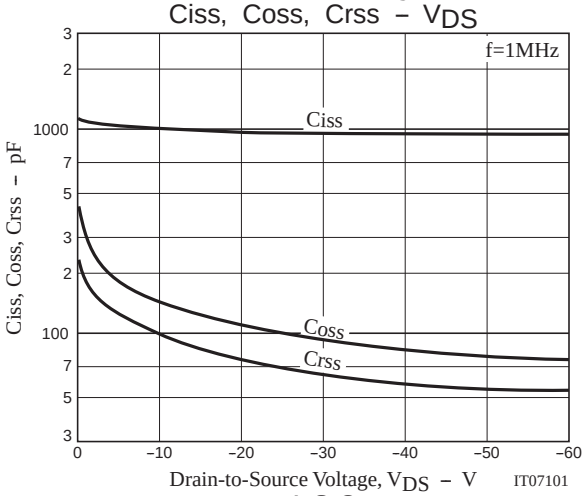

RDS(on) – VGS
Ta=25°C
ID= –2A
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT07096

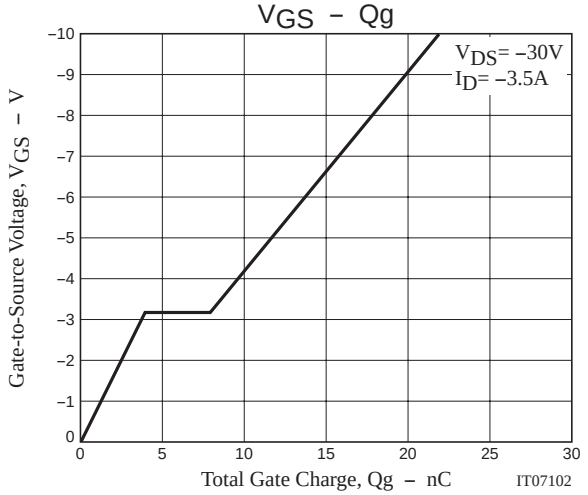

RDS(on) – Ta
ID= –2A, VGS= –4V
ID= –2A, VGS= –10V
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT07097

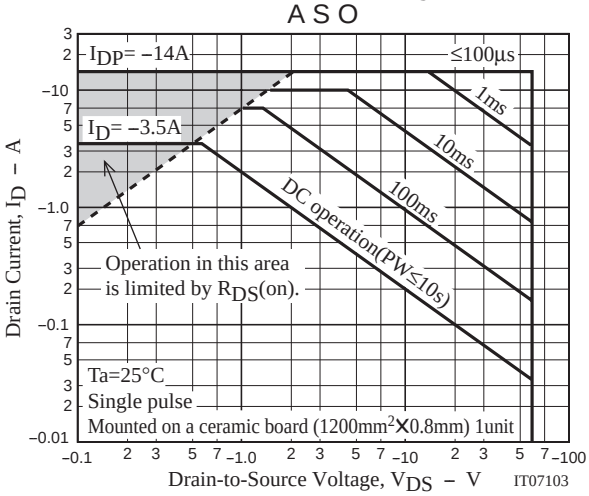

|yfs| – ID
VDS= –10V
25°C
Ta= –25°C
75°C
Forward Transfer Admittance, |yfs| – S
Drain Current, ID – A
IT07098


IF – VSD
VGS=0
Ta=75°C
25°C
–25°C
Forward Current, IF – A
Diode Forward Voltage, VSD – V
IT07099


SW Time – ID
VDD= –30V
VGS= –10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT07100


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT07101


VGS – Qg
VDS= –30V
ID= –3.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT07102


A S O
IDP= –14A
ID= –3.5A
≤100µs
1ms
10ms
100ms
DC operation(PW≤10s)
Operation in this area is limited by RDS(on).
Ta=25°C
Single pulse
Mounted on a ceramic board (1200mm2×0.8mm) 1unit
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT07103