Ordering number : ENN8199

SANYO Semiconductors
DATA SHEET

SOP8901

PNP Epitaxial Planar Silicon Transistor
N-Channel Silicon MOSFET

Motor Bridge Circuit Applications

Features

- Composite type with a PNP transistor and an N-ch Sillicon MOSFET contained in one package facilitating high-density mounting.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
[TR]				
Collector-to-Base Voltage	V_{CBO}		−30	V
Collector-to-Emitter Voltage	V_{CEO}		−30	V
Emitter-to-Base Voltage	V_{EBO}		−5	V
Collector Current	I_C		−3	A
Collector Current (Pulse)	I_{CP}		−5	A
Collector Dissipation	P_C	Mounted on a ceramic board (2000mm²×0.8mm)1unit	1.4	W
		Tc=25°C	2.0	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		−55 to +150	°C
[FET]				
Drain-to-Source Voltage	V_{DSS}		30	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current	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 (2000mm²×0.8mm)1unit	1.4	W
		Tc=25°C	2.0	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C

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SANYO Electric Co.,Ltd. Semiconductor Company
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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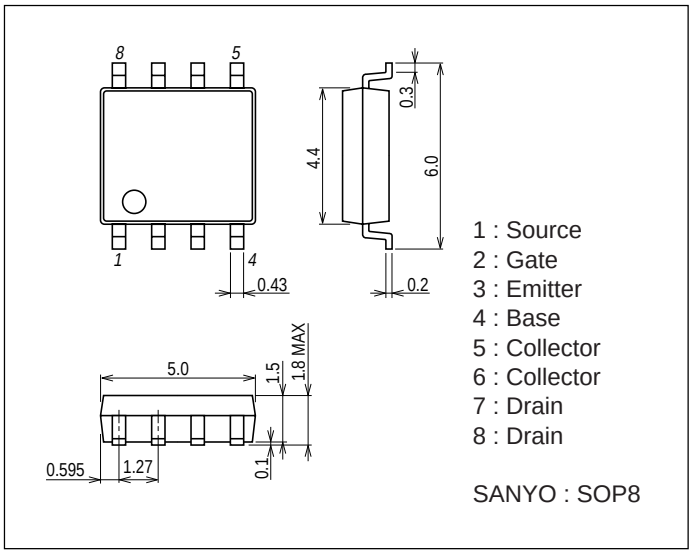
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[TR]						
Collector Cutoff Current	I_{CBO}	V_{CB}=–30V, I_E=0A			–100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=–4V, I_C=0A			–100	nA
DC Current Gain	h_{FE}	V_{CE}=–2V, I_C=–500mA	200		560	
Gain-Bandwidth Product	f_T	V_{CE}=–10V, I_C=–500mA		400		MHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		25		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=–1.5A, I_B=–30mA		–180	–270	mV
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=–1.5A, I_B=–30mA		–0.83	–1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=–10μA, I_E=0A	–30			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=–1mA, R_{BE}=∞	–30			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=–10μA, I_C=0A	–5			V
Turn-ON Time	t_{on}	See specified Test Circuit.		50		ns
Storage Time	t_{stg}	See specified Test Circuit.		270		ns
Fall Time	t_f	See specified Test Circuit.		27		ns
[FET]						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0V	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, 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=250μA	1.2		2.5	V
Forward Transfer Admittance	|yfs|	V_{DS}=10V, I_D=3.5A	3.7	5.3		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=3.5A, V_{GS}=10V		64	84	mΩ
	R_{DS}(on)2	I_D=1.8A, V_{GS}=4.5V		105	150	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		180		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		42		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		25		pF
Turn-ON Delay Time	t_d(on)	See specified Test Circuit.		7		ns
Rise Time	t_r	See specified Test Circuit.		3		ns
Turn-OFF Delay Time	t_d(off)	See specified Test Circuit.		20		ns
Fall Time	t_f	See specified Test Circuit.		6		ns
Total Gate Charge	Qg	V_{DS}=10V, V_{GS}=10V, I_D=3.5A		5.0		nC
Gate-to-Source Charge	Qgs	V_{DS}=10V, V_{GS}=10V, I_D=3.5A		0.9		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=10V, V_{GS}=10V, I_D=3.5A		0.6		nC
Diode Forward Voltage	V_{SD}	I_S=3.5A, V_{GS}=0V		0.88	1.2	V

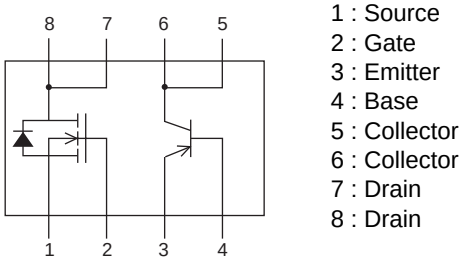
Package Dimensions

unit : mm

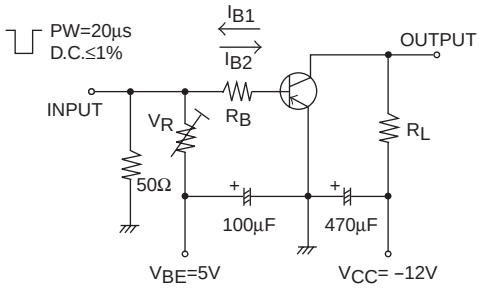
7005-011



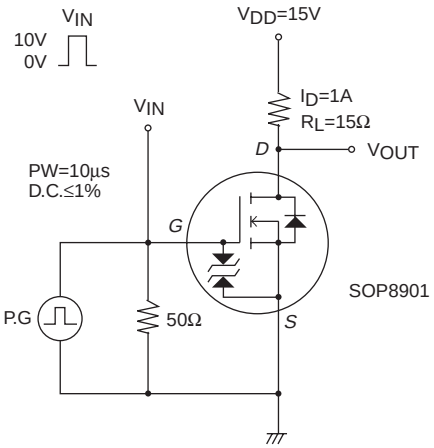
Electrical Connection

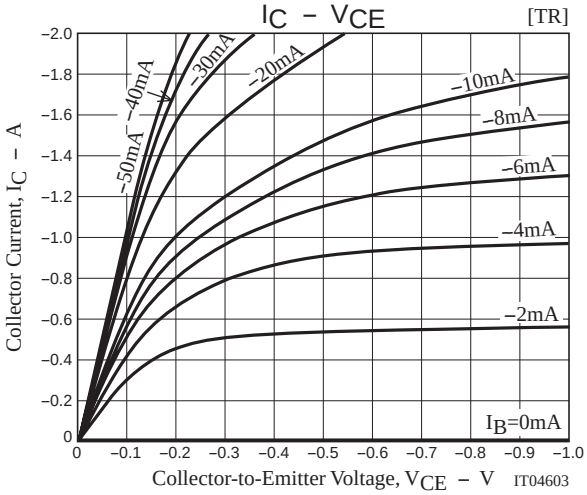


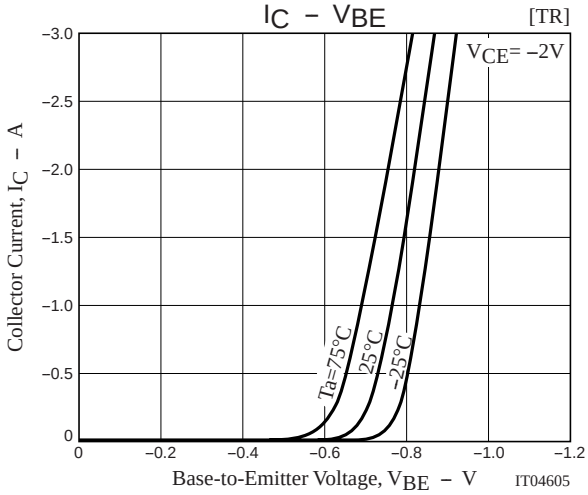
Switching Time Test Circuit

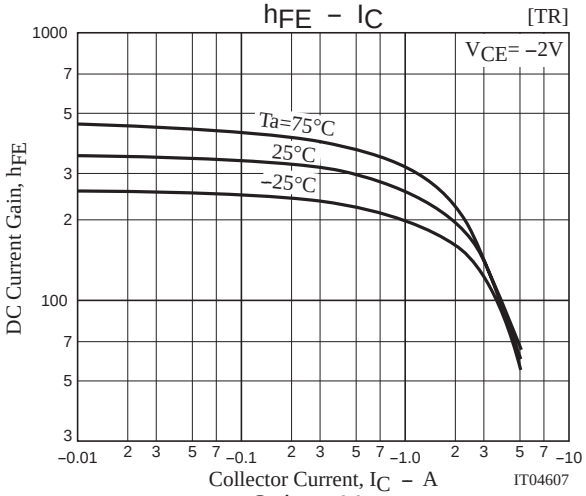


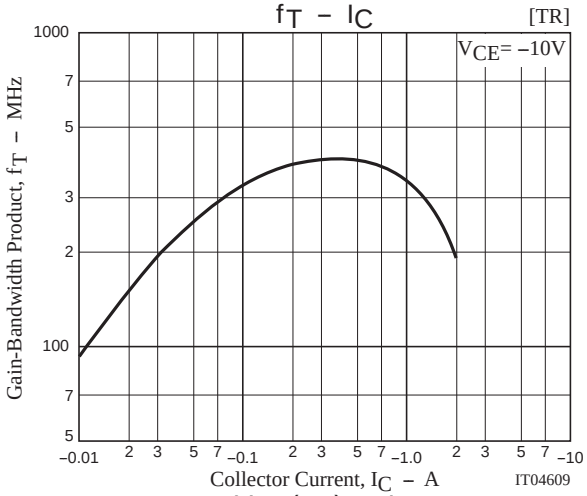
$I_C = 20I_{B1} = -20I_{B2} = -500mA$

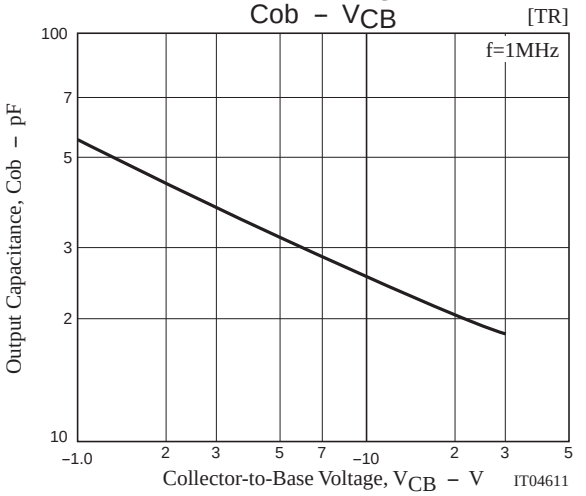


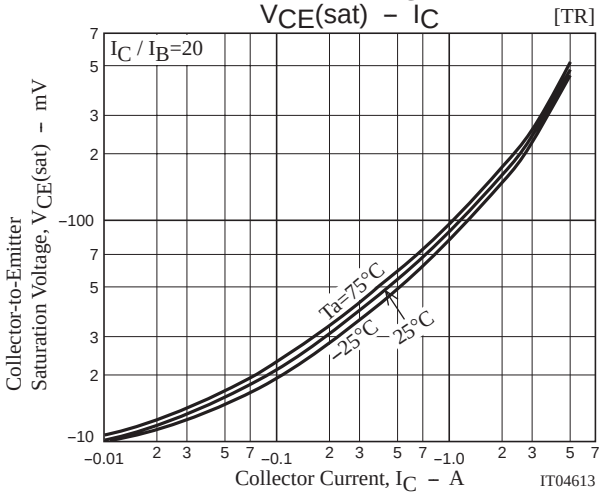


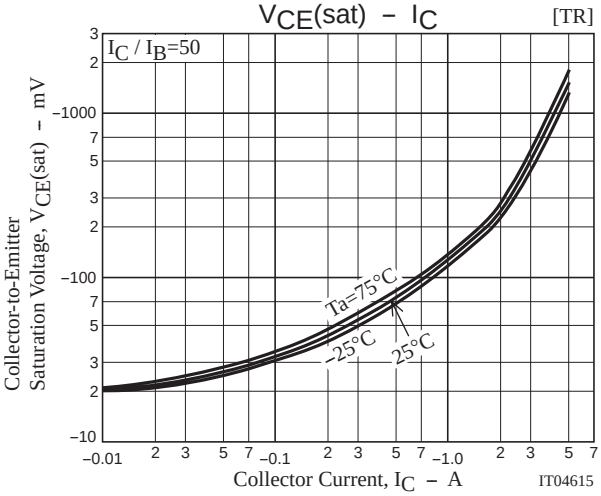


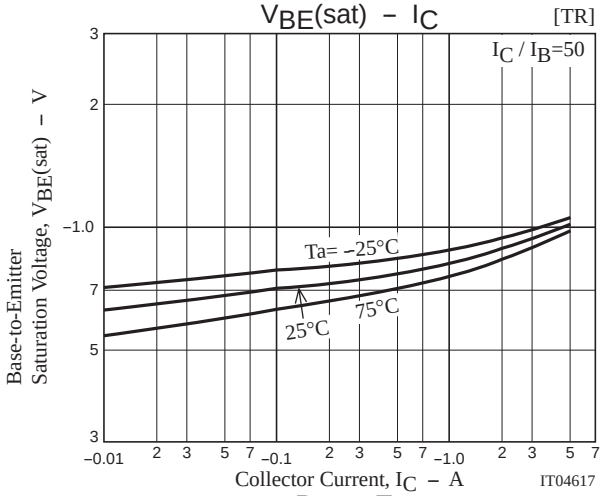


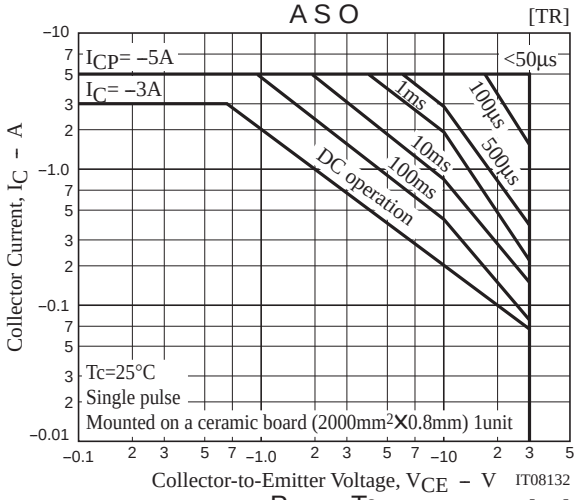


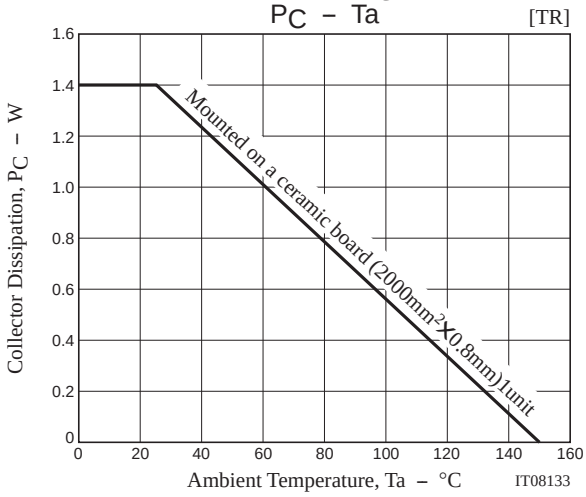


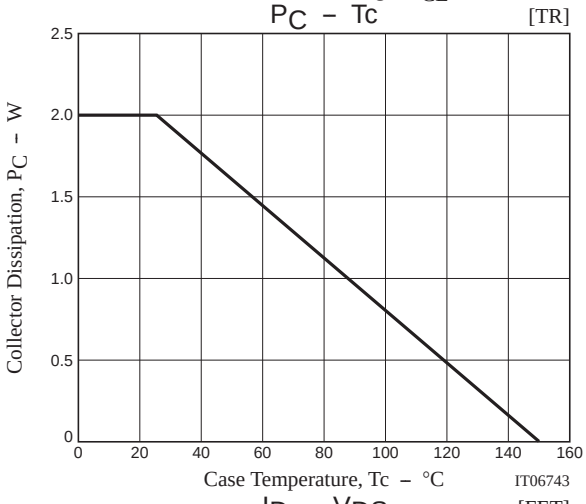


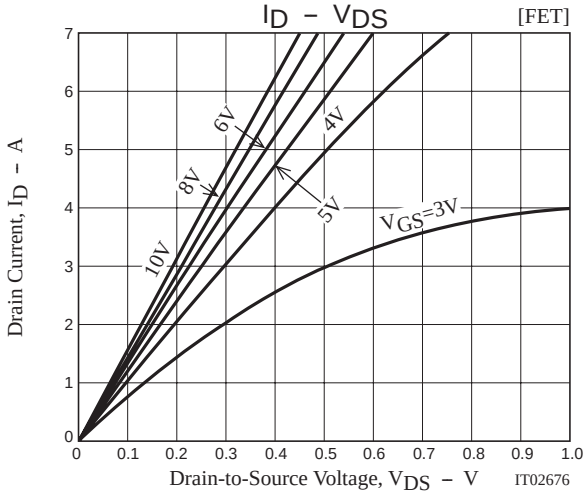

VCE(sat) – IC
[TR]
IC / IB=50
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Ta=75°C
25°C
–25°C
Collector Current, IC – A
IT04615

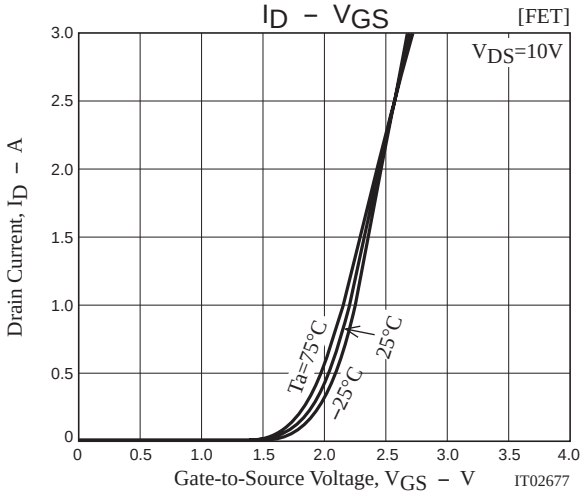

VBE(sat) – IC
[TR]
IC / IB=50
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Ta= –25°C
25°C
75°C
Collector Current, IC – A
IT04617


ASO
[TR]
ICP= –5A
IC= –3A
<50µs
1ms
100µs
10ms
500µs
100ms
DC operation
Tc=25°C
Single pulse
Mounted on a ceramic board (2000mm²×0.8mm) 1unit
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
IT08132

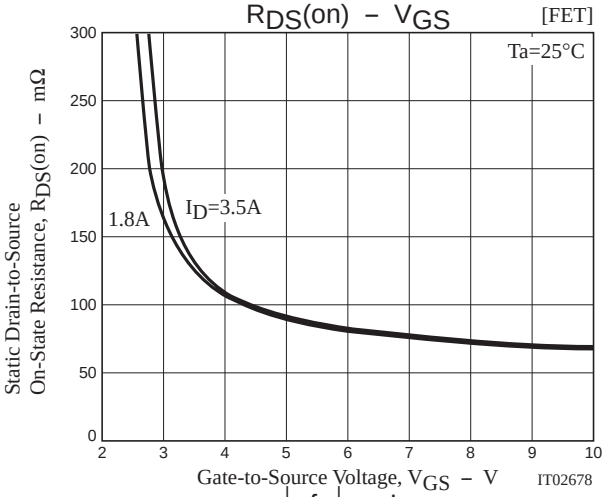

PC – Ta
[TR]
Mounted on a ceramic board (2000mm²×0.8mm)1unit
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT08133


PC – Tc
[TR]
Collector Dissipation, PC – W
Case Temperature, Tc – °C
IT06743

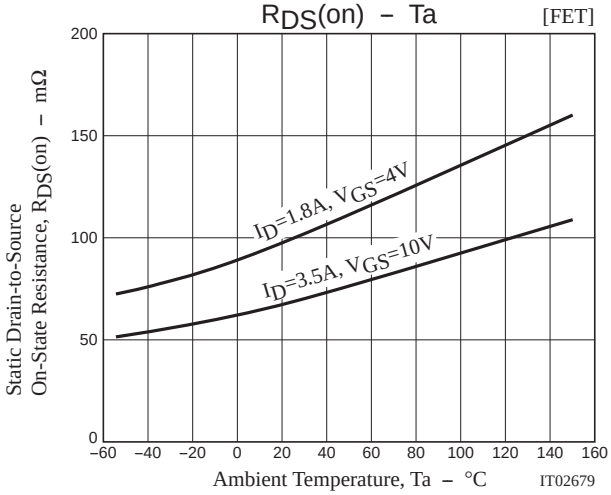

ID – VDS
[FET]
Drain Current, ID – A
10V
8V
6V
5V
4V
VGS=3V
Drain-to-Source Voltage, VDS – V
IT02676


ID – VGS
[FET]
VDS=10V
Drain Current, ID – A
Ta=75°C
25°C
–25°C
Gate-to-Source Voltage, VGS – V
IT02677

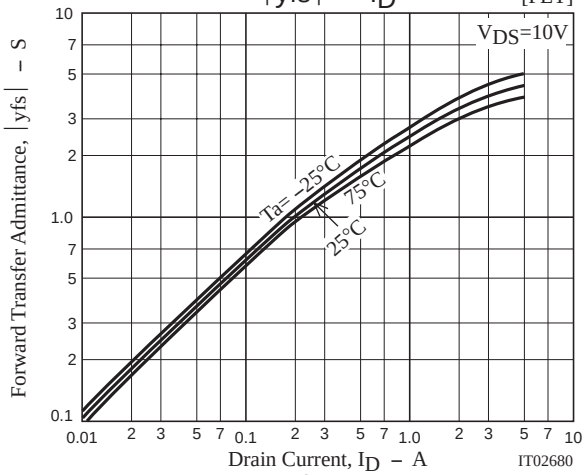
$R_{DS}(on)$ – V_{GS} [FET]



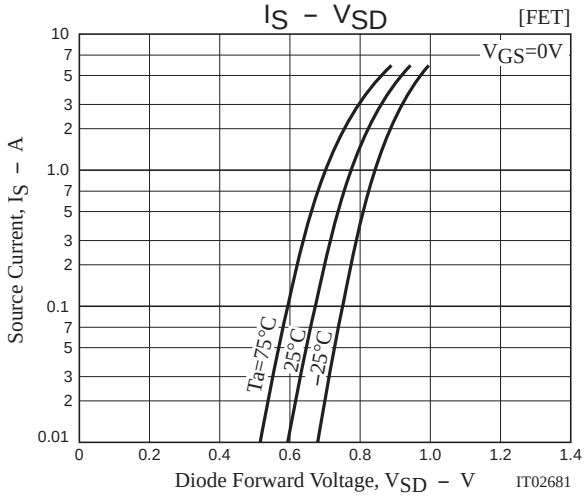
$R_{DS}(on)$ – Ta [FET]



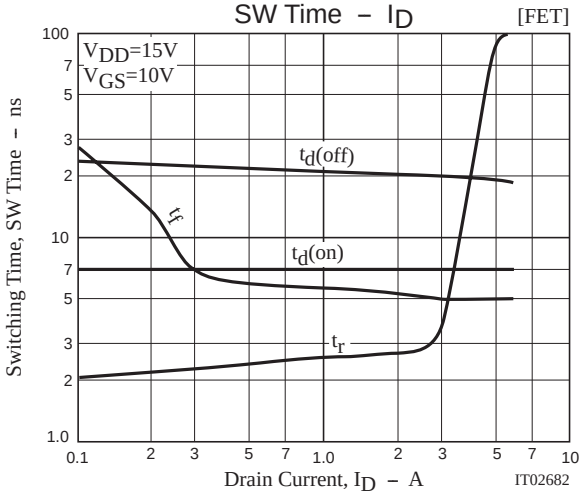
$|yfs|$ – I_D [FET]



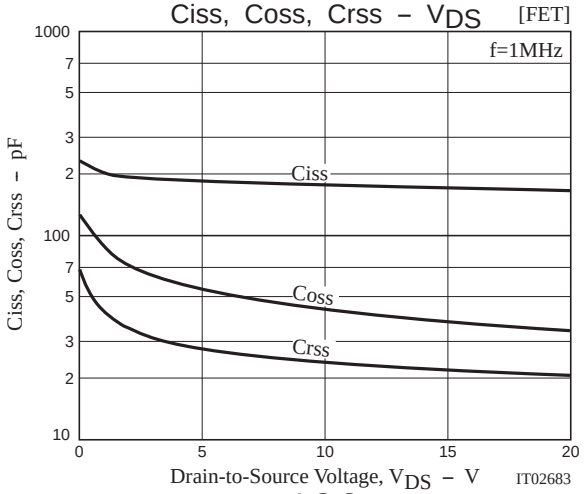
I_S – V_{SD} [FET]



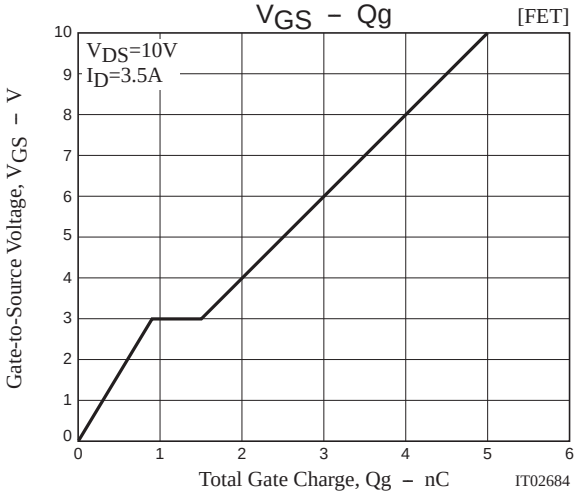
SW Time – I_D [FET]



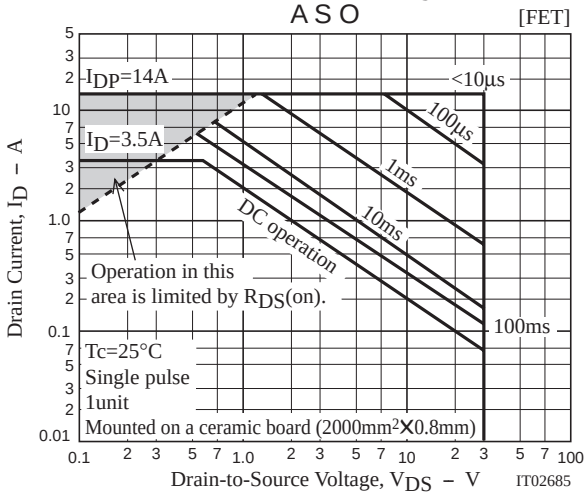
Ciss, Coss, Crss – V_{DS} [FET]

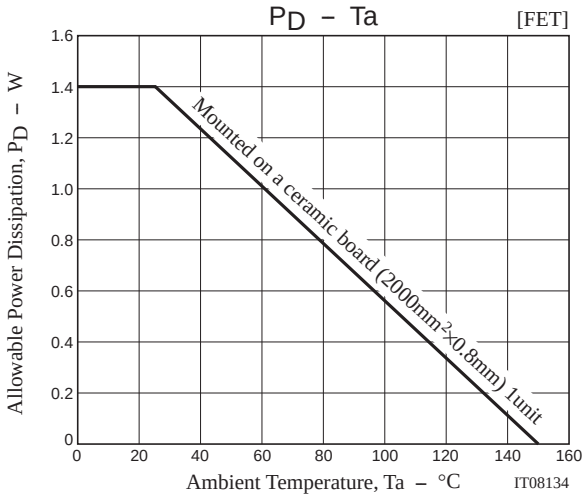


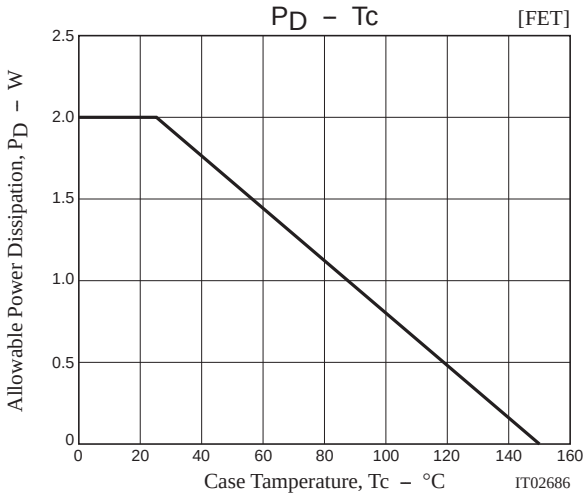
V_{GS} – Qg [FET]



A S O [FET]







Note on usage : Since the SOP8901 includes MOSFET, please avoid using this device in the vicinity of highly charged objects.

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