Ordering number : ENA1445

SANYO Semiconductors

DATA SHEET

P-Channel Silicon MOSFET

EMH2308 — General-Purpose Switching Device Applications

Features

- The EMH2308 incorporates a P-channel MOSFET that feature low ON-resistance and ultrahigh-speed switching, thereby enabling high-density mounting.
- 1.8V drive.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		−20	V
Gate-to-Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		−3	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	−20	A
Allowable Power Dissipation	P_D	When mounted on ceramic substrate (900mm^2×0.8mm) 1unit	1.0	W
Total Dissipation	P_T	When mounted on ceramic substrate (900mm^2×0.8mm)	1.2	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}=0V	−20			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=−20V, V_{GS}=0V			−1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0V			±10	μA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=−10V, I_D=−1mA	−0.4		−1.3	V
Forward Transfer Admittance	|yfs|	V_{DS}=−10V, I_D=−1.5A	2.1	3.6		S

Marking : MH

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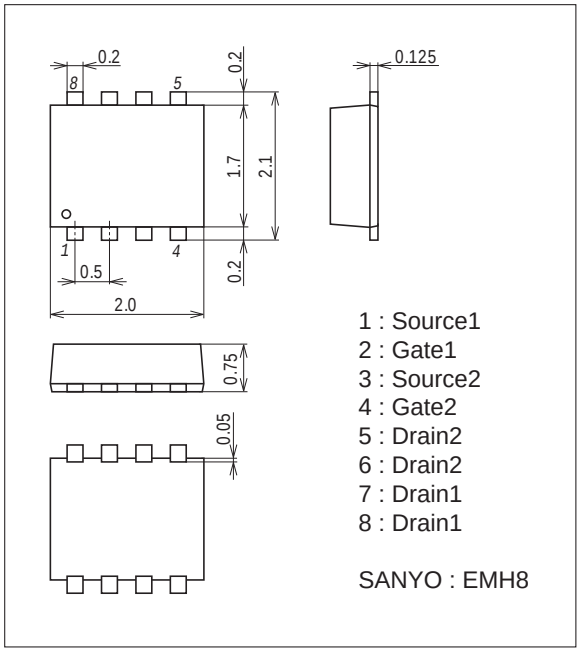
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Static Drain-to-Source On-State Resistance	$R_{DS}(on)1$	I_D=−3A, V_{GS}=−4.5V		65	85	mΩ
	$R_{DS}(on)2$	I_D=−1.0A, V_{GS}=−2.5V		98	137	mΩ
	$R_{DS}(on)3$	I_D=−0.5A, V_{GS}=−1.8V		155	235	mΩ
Input Capacitance	Ciss	V_{DS}=−10V, f=1MHz		320		pF
Output Capacitance	Coss	V_{DS}=−10V, f=1MHz		66		pF
Reverse Transfer Capacitance	Crss	V_{DS}=−10V, f=1MHz		50		pF
Turn-ON Delay Time	$t_d(on)$	See specified Test Circuit.		7.1		ns
Rise Time	t_r	See specified Test Circuit.		21		ns
Turn-OFF Delay Time	$t_d(off)$	See specified Test Circuit.		37		ns
Fall Time	t_f	See specified Test Circuit.		32		ns
Total Gate Charge	Qg	V_{DS}=−10V, V_{GS}=−4.5V, I_D=−3A		4.0		nC
Gate-to-Source Charge	Qgs	V_{DS}=−10V, V_{GS}=−4.5V, I_D=−3A		0.6		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=−10V, V_{GS}=−4.5V, I_D=−3A		1.1		nC
Diode Forward Voltage	V_{SD}	I_S=−3A, V_{GS}=0V		−0.83	−1.2	V

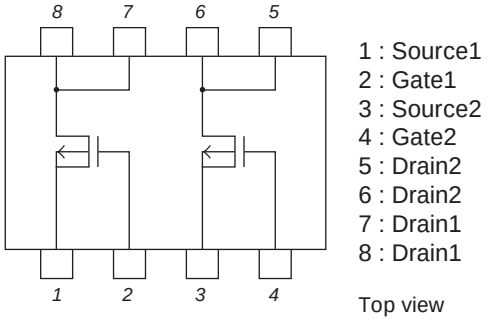
Package Dimensions

unit : mm (typ)

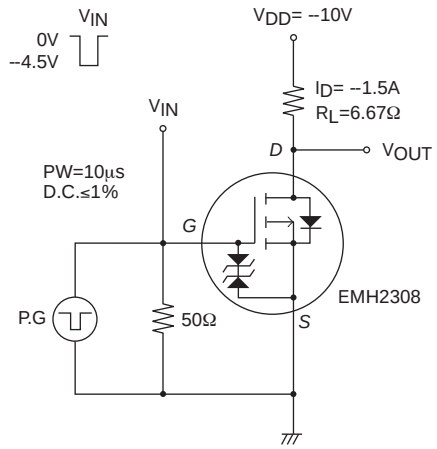
7045-002

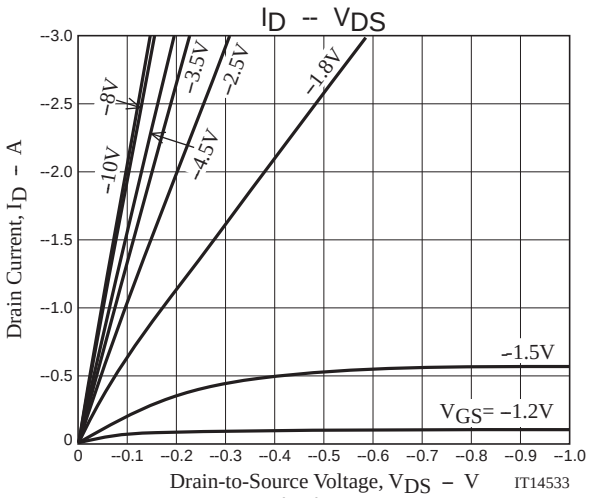


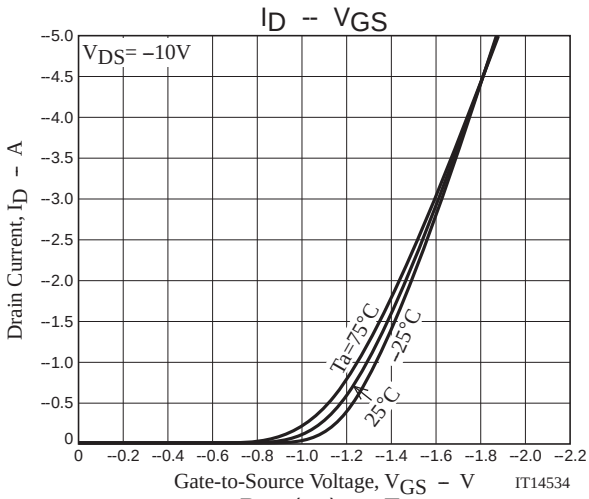
Electrical Connection

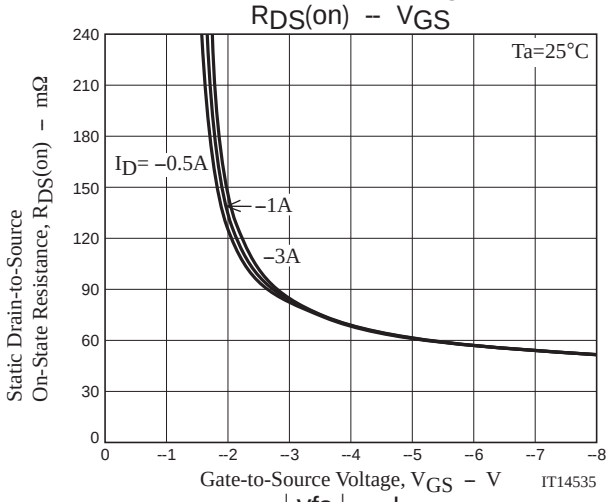


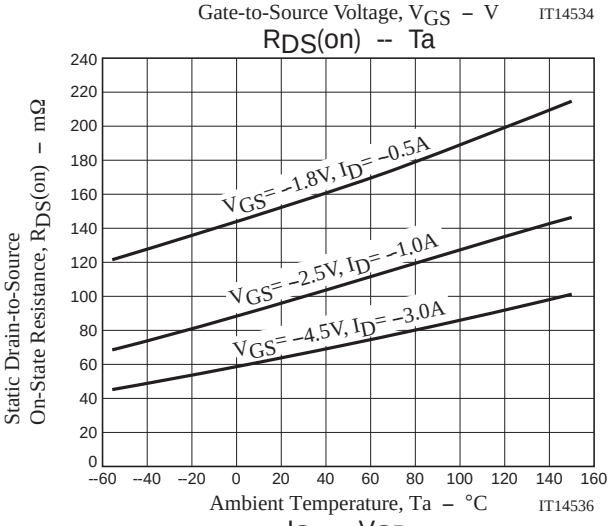
Switching Time Test Circuit

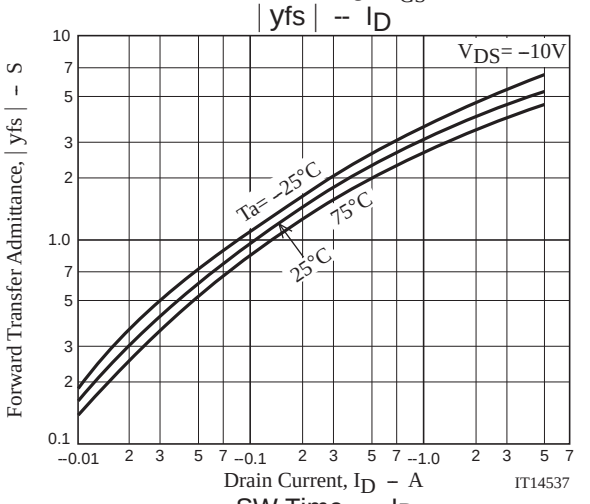


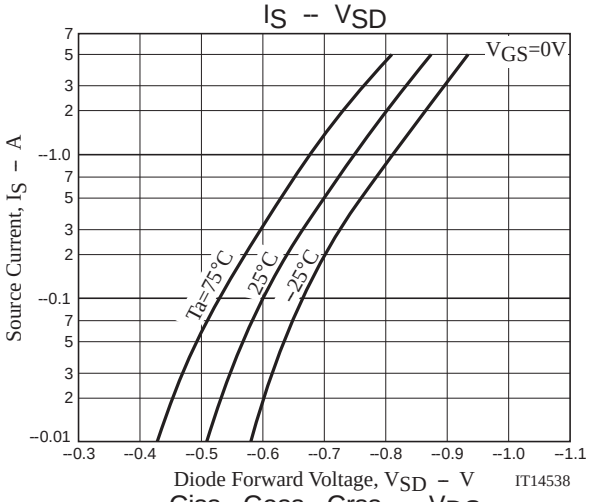

ID -- VDS
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT14533
–8V
–10V
–3.5V
–2.5V
–4.5V
–1.8V
–1.5V
VGS= –1.2V

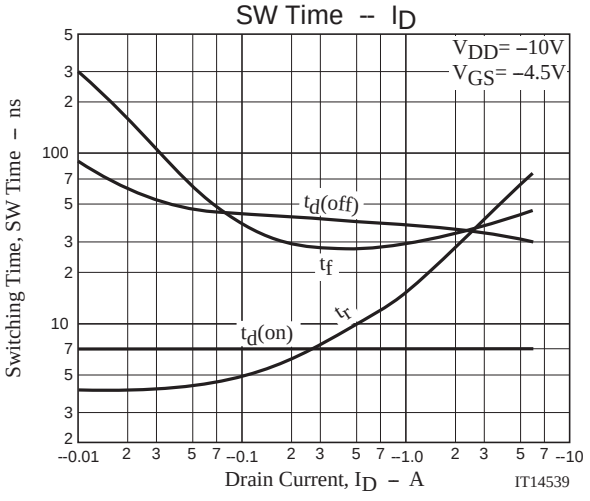

ID -- VGS
VDS= –10V
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT14534
Ta=75°C
25°C
–25°C

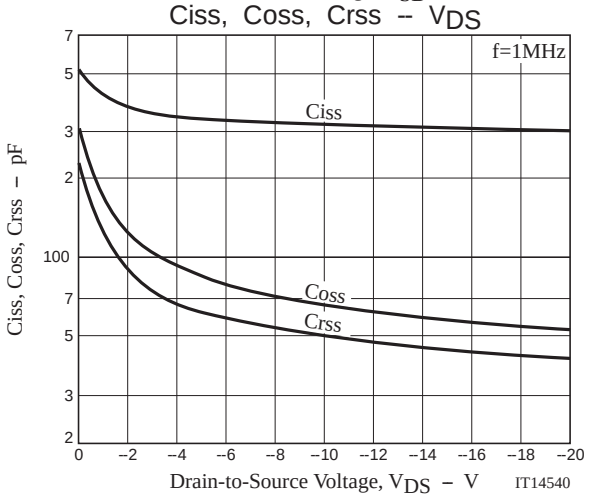

RDS(on) -- VGS
Ta=25°C
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT14535
ID= –0.5A
–1A
–3A

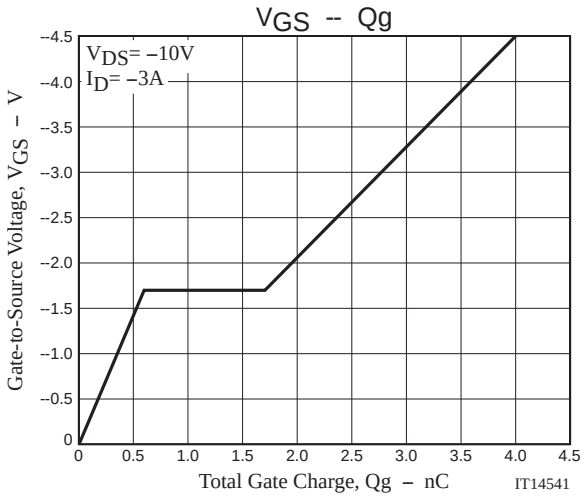

RDS(on) -- Ta
Static Drain-to-Source On-State Resistance, RDS(on) – mΩ
Ambient Temperature, Ta – °C
IT14536
VGS= –1.8V, ID= –0.5A
VGS= –2.5V, ID= –1.0A
VGS= –4.5V, ID= –3.0A

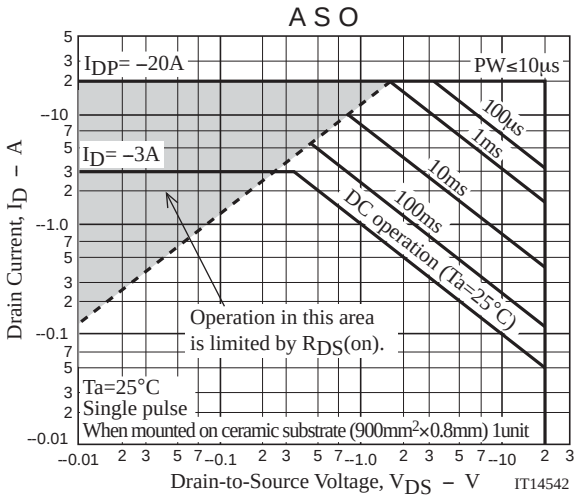

| yfs | -- ID
VDS= –10V
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT14537
Ta= –25°C
75°C
25°C

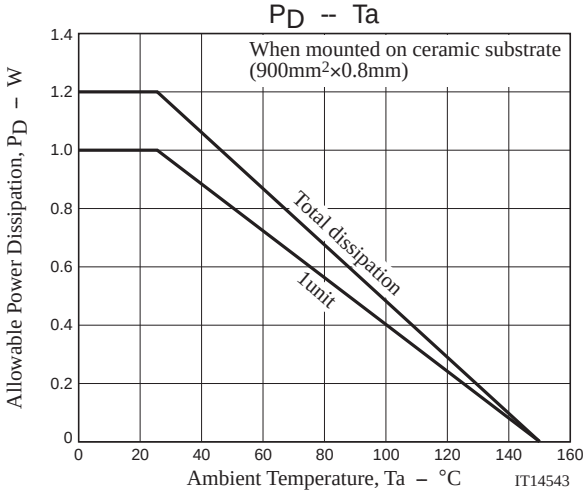

IS -- VSD
VGS=0V
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT14538
Ta=75°C
25°C
–25°C


SW Time -- ID
VDD= –10V
VGS= –4.5V
Switching Time, SW Time – ns
Drain Current, ID – A
IT14539
td(off)
tf
tr
td(on)


Ciss, Coss, Crss -- VDS
f=1MHz
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT14540
Ciss
Coss
Crss







Note on usage : Since the EMH2308 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.