

# EMH2407

## EMH2407 General-Purpose Switching Device Applications

### Features

- Low ON-Resistance
- Best Suited for LiB Charging and Discharging Switch
- Common-Drain Type
- 2.5 V Drive
- Protection Diode In

### ABSOLUTE MAXIMUM RATINGS at Ta = 25°C

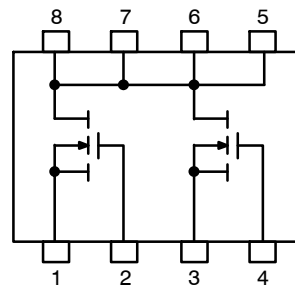
Symbol	Parameter	Conditions	Ratings	Unit
V <sub>DSS</sub>	Drain to Source Voltage		20	V
V <sub>GSS</sub>	Gate to Source Voltage		±12	V
I <sub>D</sub>	Drain Current (DC)		6	A
I <sub>DP</sub>	Drain Current (Pulse)	PW ≤ 10 μs, duty cycles ≤ 1%	40	A
P <sub>D</sub>	Allowable Power Dissipation	When mounted on ceramic substrate (900 mm <sup>2</sup> × 0.8 mm) 1 unit	1.3	W
P <sub>T</sub>	Total Dissipation	When mounted on ceramic substrate (900 mm <sup>2</sup> × 0.8 mm)	1.4	W
T <sub>CH</sub>	Channel Temperature		150	°C
T <sub>STG</sub>	Storage Temperature		-55 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

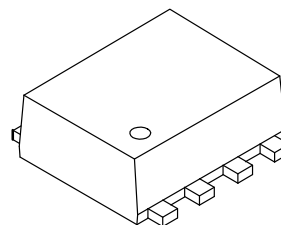


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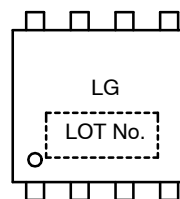


ELECTRICAL CONNECTION



EMH8  
CASE 419AT

### MARKING DIAGRAM



LG = Specific Device Code  
XX = Lot Number

### ORDERING INFORMATION

Device	Package	Memo	Shipping
EMH2407-TL-H	EMH8	Pb-Free/ Halogen Free	3000 Units/ Reel

## ELECTRICAL CHARACTERISTICS at Ta = 25°C

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	Drain to Source Breakdown Voltage	$I_D = 1 \text{ mA}$ , $V_{GS} = 0 \text{ V}$	20			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 20 \text{ V}$ , $V_{GS} = 0 \text{ V}$			1	$\mu\text{A}$
$I_{GSS}$	Gate to Source Leakage Current	$V_{GS} = \pm 8 \text{ V}$ , $V_{DS} = 0 \text{ V}$			$\pm 10$	$\mu\text{A}$
$V_{GS(off)}$	Cutoff Voltage	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$	0.5		1.3	V
$ y_{fs} $	Forward Transfer Admittance	$V_{DS} = 10 \text{ V}$ , $I_D = 3 \text{ A}$	3	5		S
$R_{DS(on)1}$	Static Drain to Source On-State Resistance	$I_D = 3 \text{ A}$ , $V_{GS} = 4.5 \text{ V}$	13	19	25	$\text{m}\Omega$
$R_{DS(on)2}$		$I_D = 3 \text{ A}$ , $V_{GS} = 4 \text{ V}$	14	20	26	$\text{m}\Omega$
$R_{DS(on)3}$		$I_D = 1.5 \text{ A}$ , $V_{GS} = 2.5 \text{ V}$	16	28	39	$\text{m}\Omega$
$C_{iss}$	Input Capacitance	$V_{DS} = 10 \text{ V}$ , $f = 1 \text{ MHz}$		580		pF
$C_{oss}$	Output Capacitance			95		pF
$C_{rss}$	Reverse Transfer Capacitance			75		pF
$t_d(on)$	Turn-ON Delay Time	See specified Test Circuit.		310		ns
$t_r$	Rise Time			1020		ns
$t_d(off)$	Turn-OFF Delay Time			3000		ns
$t_f$	Fall Time			2250		ns
$Q_g$	Total Gate Charge	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 4.5 \text{ V}$ , $I_D = 6 \text{ A}$		6.3		nC
$Q_{gs}$	Gate to Source Charge			0.83		nC
$Q_{gd}$	Gate to Drain "Miller" Charge			1.9		nC
$V_{SD}$	Diode Forward Voltage	$I_S = 6 \text{ A}$ , $V_{GS} = 0 \text{ V}$		0.78		V

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

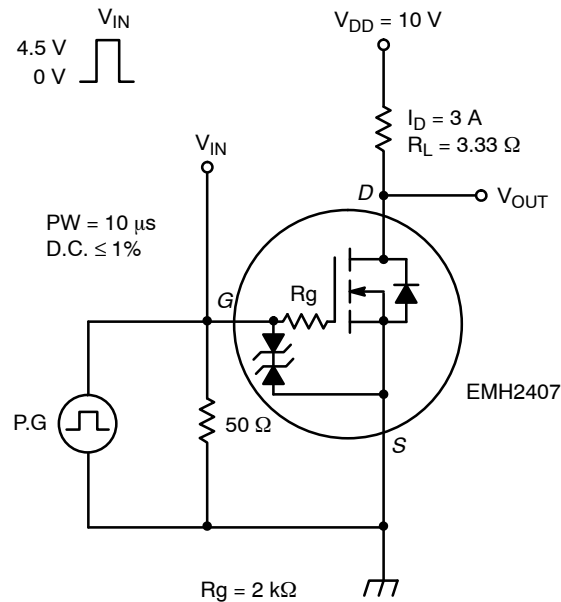


Figure 1. Switching Time Test Circuit

TYPICAL CHARACTERISTICS

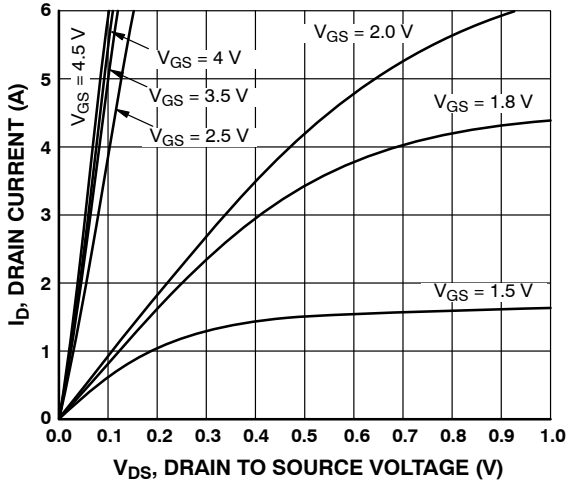


Figure 2.  $I_D - V_{DS}$

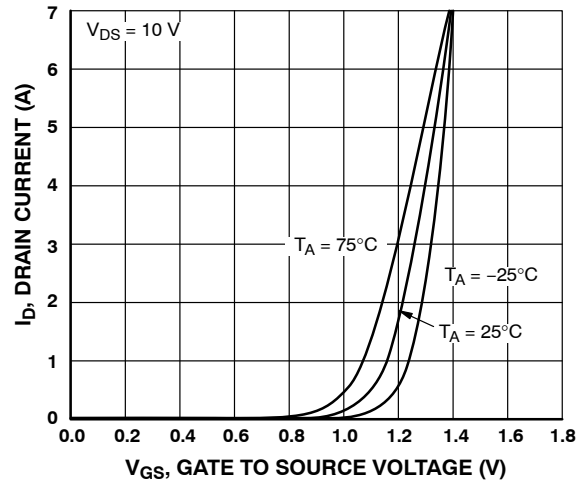


Figure 3.  $I_D - V_{GS}$

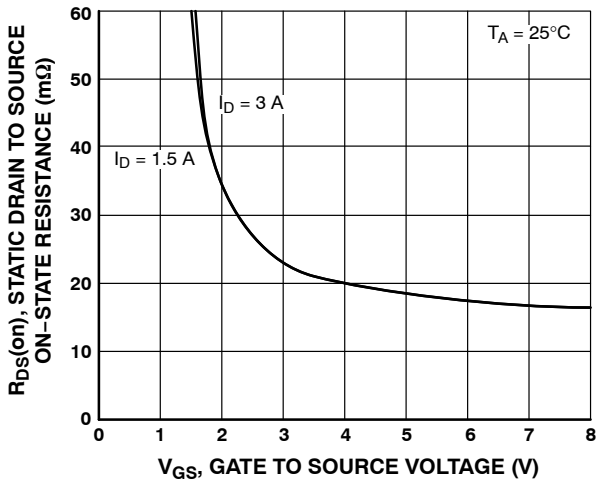


Figure 4.  $R_{DS(on)} - V_{GS}$

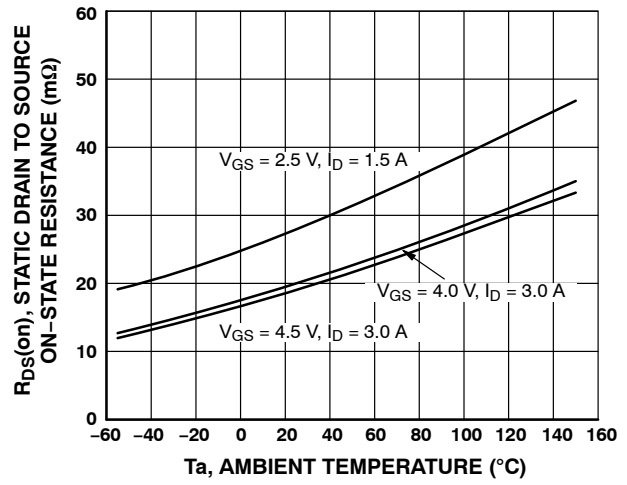


Figure 5.  $R_{DS(on)} - T_A$

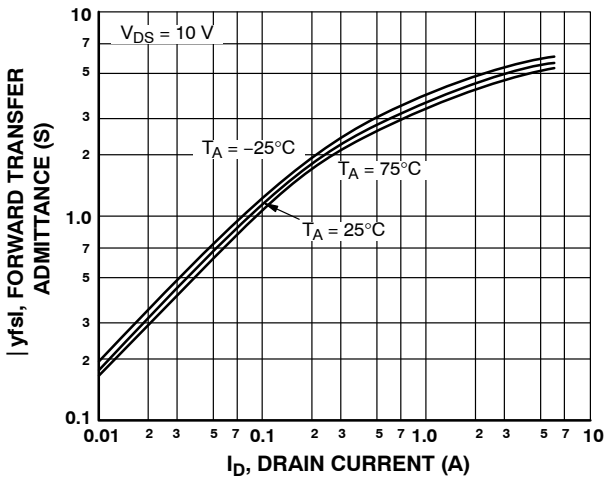


Figure 6.  $|y_{fs}| - I_D$

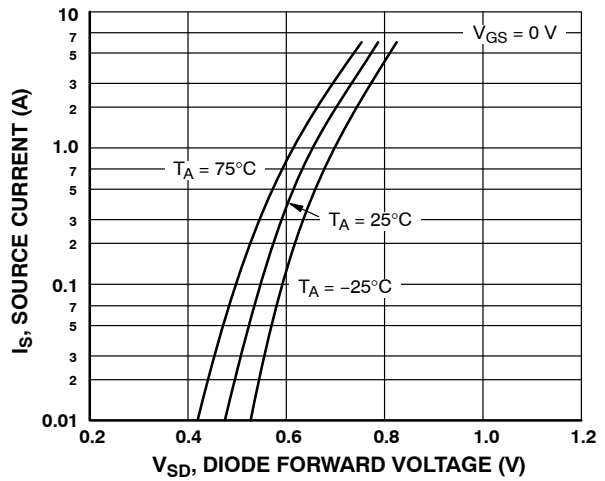


Figure 7.  $I_S - V_{SD}$

TYPICAL CHARACTERISTICS (continued)

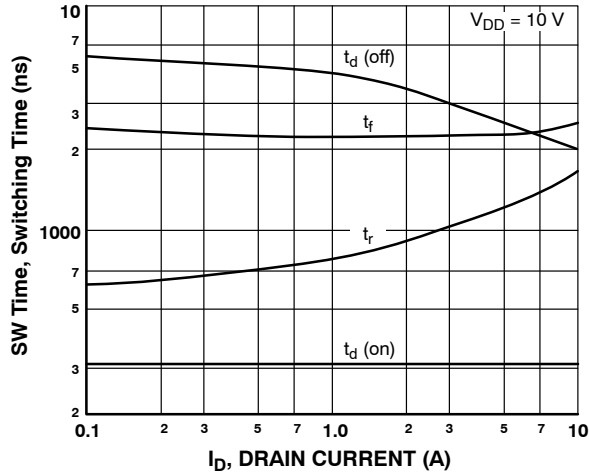


Figure 8. SW Time –  $I_D$

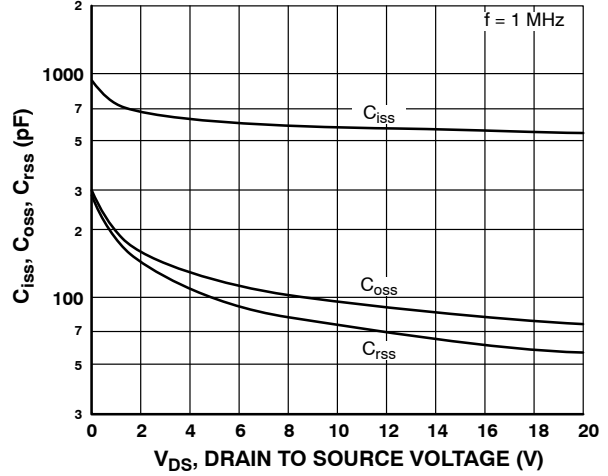


Figure 9.  $C_{iss}$ ,  $C_{oss}$ ,  $C_{rss}$  –  $V_{DS}$

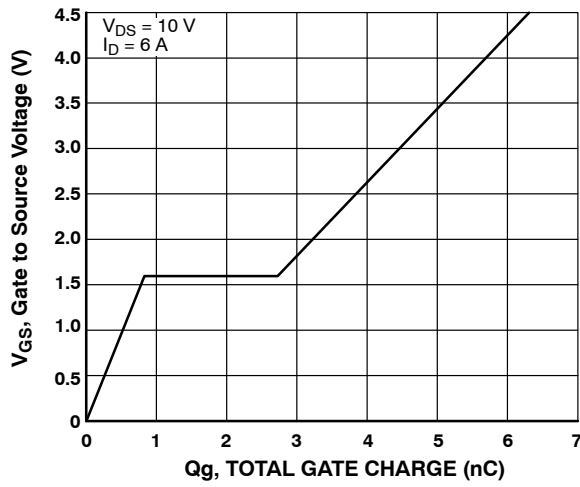


Figure 10.  $V_{GS}$  –  $Q_g$

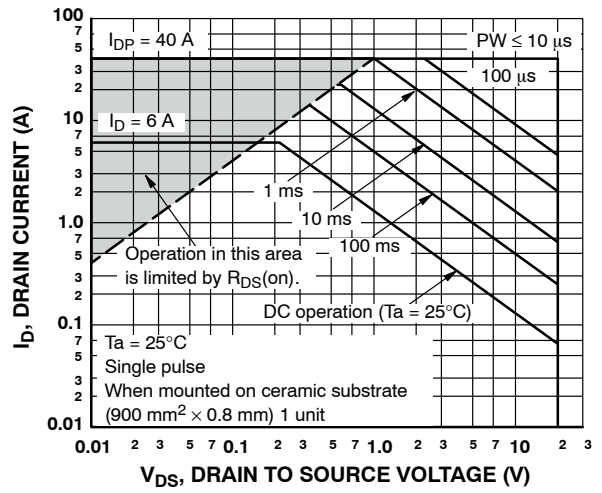


Figure 11. ASO

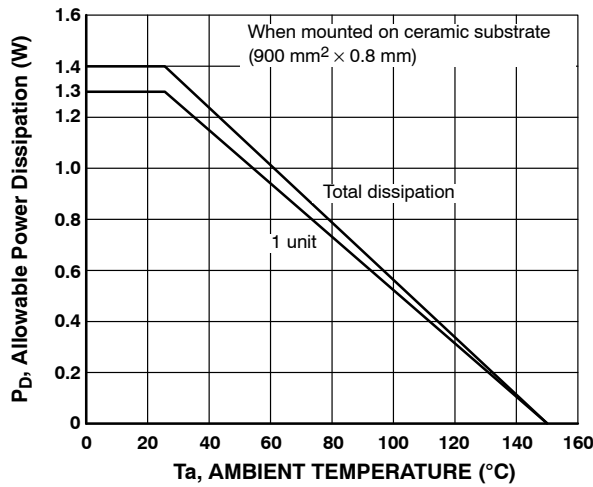



Figure 12.  $P_D$  –  $T_a$



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