

## HM2384

### N-Channel Enhancement Mode MOSFET

#### ➤ Features

VDS	VGS	RDSON Typ.	ID
20V	±12V	11.5mR@10V	7A
		13mR@4V5	
		15mR@2V5	

#### ➤ Description

This HM2384 combines advanced trench MOSFET technology with a low resistance package to provide extremely low RDSON. This device is ideal for load switch and battery protection applications.

#### ➤ Applications

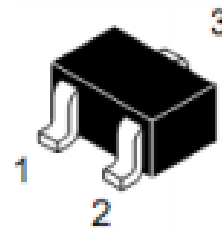
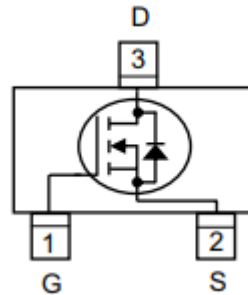
- Load Switch
- Li-ion battery protection

#### ➤ Ordering Information

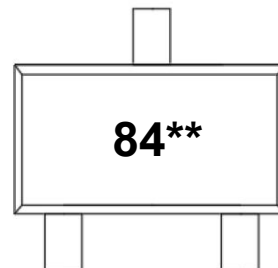
Device	Package	Shipping
HM2384	SOT23	3000/Reel

#### ➤ Pin configuration

Top view



SOT23



Marking

➤ **Absolute Maximum Ratings**( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Symbol	Parameter		Ratings	Unit
$V_{DSS}$	Drain-to-Source Voltage		20	V
$V_{GSS}$	Gate-to-Source Voltage		$\pm 12$	V
$I_D$	Continuous Drain Current <sup>a</sup>		7	A
$I_{DM}$	Pulsed Drain Current <sup>b</sup>		30	A
$P_D$	Power Dissipation <sup>c</sup>	$T_C=25^{\circ}\text{C}$	1.2	W
$P_{DSM}$	Power Dissipation <sup>a</sup>	$T_A=25^{\circ}\text{C}$	0.65	W
$T_J$	Operation junction temperature		-55 to 150	$^{\circ}\text{C}$
$T_{STG}$	Storage temperature range		-55 to 150	$^{\circ}\text{C}$

➤ **Thermal Resistance Ratings**( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Symbol	Parameter	Typical	Maximum	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance <sup>a</sup>		200	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Junction-to-Case Thermal Resistance		105	

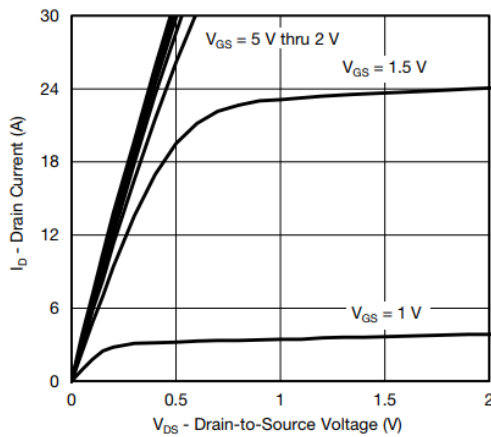
Note:

- The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz.copper,in a still air environment with  $T_A=25^{\circ}\text{C}$ .The value in any given application depends on the user is specific board design. The current rating is based on the  $t \leq 10\text{s}$  thermal resistance rating.
- Repetitive rating, pulse width limited by junction temperature.
- The power dissipation  $P_D$  is based on  $T_{J(MAX)}=150^{\circ}\text{C}$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.

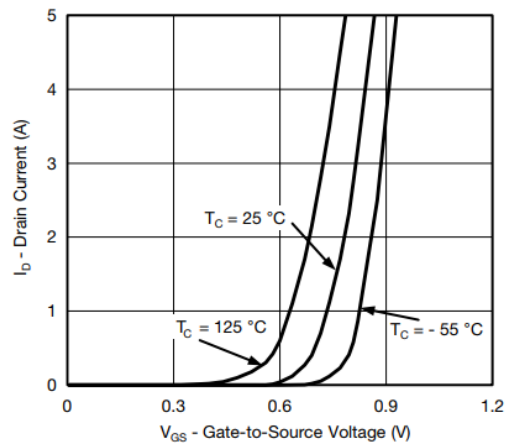
➤ **Electronics Characteristics**( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.7	1	V
$R_{DS(on)}$	Drain-Source On- Resistance	$V_{GS}=10V, I_D=4.5A$		11	15	mR
		$V_{GS}=4.5V, I_D=3.5A$		13	18	
		$V_{GS}=2.5V, I_D=2.5A$		15	22	
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=16V, V_{GS}=0V$			1	$\mu A$
$I_{GSS}$	Gate-Source leak current	$V_{GS}=\pm 12V, V_{DS}=0V$			$\pm 100$	nA
$G_{FS}$	Transconductance	$V_{DS}=5V, I_D=4.5A$		8		S
$V_{SD}$	Forward Voltage	$V_{GS}=0V, I_S=0.5A$		0.8	1.3	V
$C_{iss}$	Input Capacitance	$V_{DS}=8V, V_{GS}=0V, f=1MHz$		600		pF
$C_{oss}$	Output Capacitance			330		
$C_{rss}$	Reverse Transfer Capacitance			140		
$T_{D(ON)}$	Turn-on delay time	$V_{GEN}=4.5V, R_L=10R$ $V_{DS}=10V, R_G=6R, I_D=1A$		7		ns
$T_r$	Rise Time			13		
$T_{D(OFF)}$	Turn-off delay time			48		
$T_f$	Fall Time			22		
$Q_g$	Total Gate charge	$V_{GS}=4.5V, V_{DS}=10V, I_D=4A$		8.5		nC
$Q_{gs}$	Gate to Source charge			1.8		
$Q_{gd}$	Gate to Drain charge			2.2		

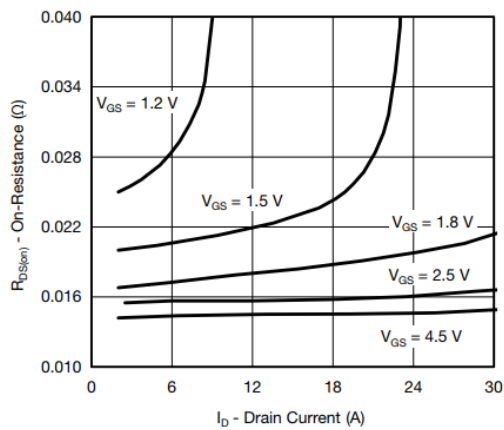
➤ Typical Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise noted)



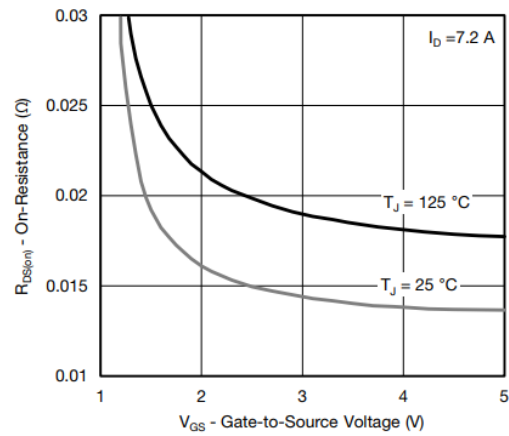
Output Characteristics



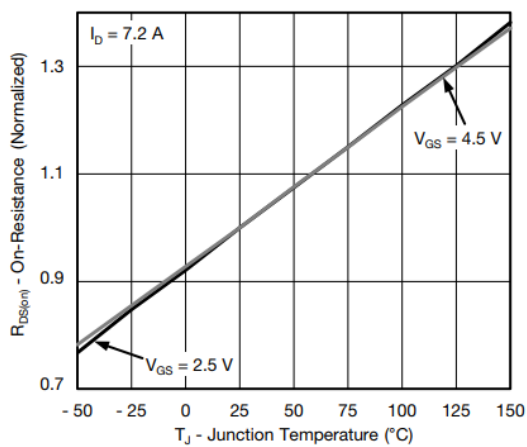
Transfer Characteristics



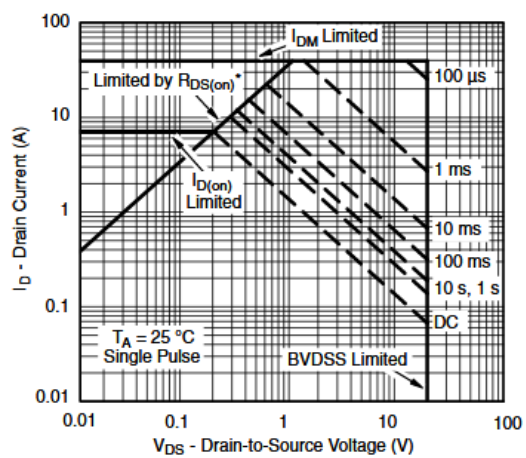
On-Resistance vs. Drain Current and Gate Voltage



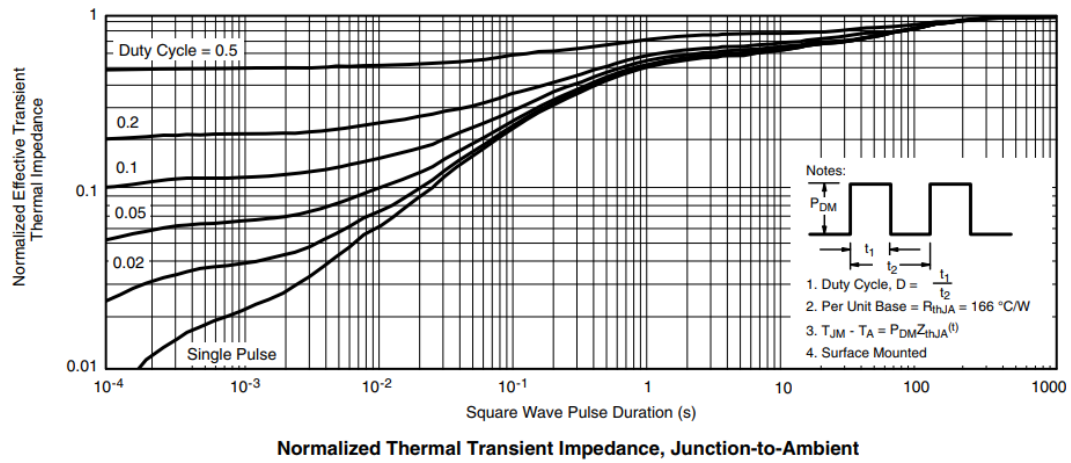
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Junction Temperature



\*  $V_{GS}$  > minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified  
Safe Operating Area, Junction-to-Ambient



## ➤ Package Information

