

HM40SDN02Q

Dual Asymmetric N-Channel Enhancement Mode MOSFET

➤ Features

VDS	VGS	RDS(on) Typ.	ID
20V	±20V	5.2mR@10V	40A
		6.8mR@4V5	

➤ Description

This device uses advanced trench technology to provide excellent RDS(on) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

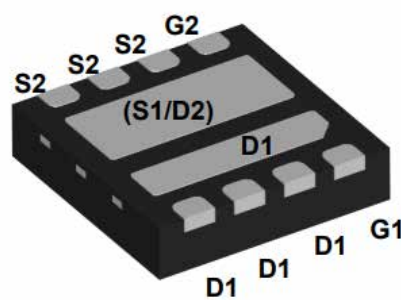
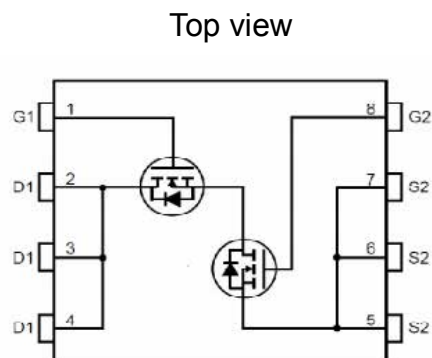
➤ Applications

- Power Management in notebook computer
- Portable Equipment
- Battery Powered Systems

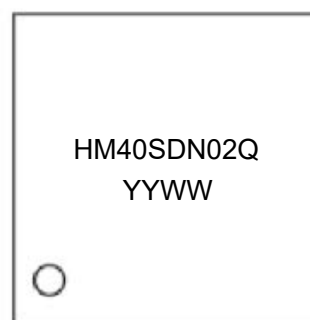
➤ Ordering Information

Device	Package	Shipping
HM40SDN02Q	DFN3X3	5000/Reel

➤ Pin configuration



Bottom View



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		± 20	V
I_D	Continuous Drain Current	$TC=25^{\circ}\text{C}$	40	A
		$TC=100^{\circ}\text{C}$	28	A
I_{DM}	Pulsed Drain Current ^b		120	A
I_{DSM}	Continuous Drain Current ^a	$TA=25^{\circ}\text{C}$	14	A
		$TA=70^{\circ}\text{C}$	9	A
P_D	Power Dissipation ^c	$TC=25^{\circ}\text{C}$	25	W
		$TC=100^{\circ}\text{C}$	10	W
P_{DSM}	Power Dissipation ^a	$TA=25^{\circ}\text{C}$	2.5	W
		$TA=70^{\circ}\text{C}$	0.9	W
I_{AS}	Avalanche Current		40	A
E_{AS}	Avalanche Energy, $L=0.05\text{mH}$		16	mJ
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 ^a		55	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Junction-to-Case Thermal Resistance		6	

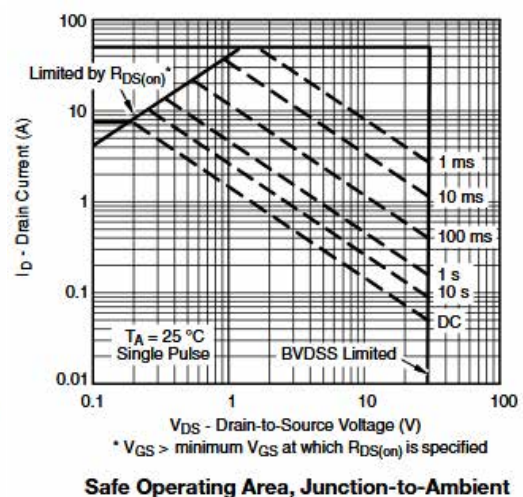
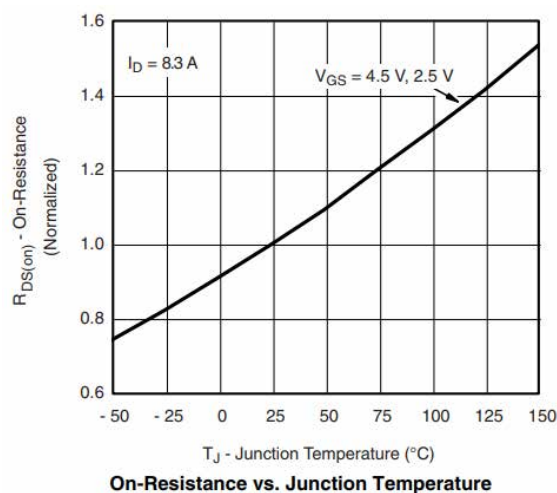
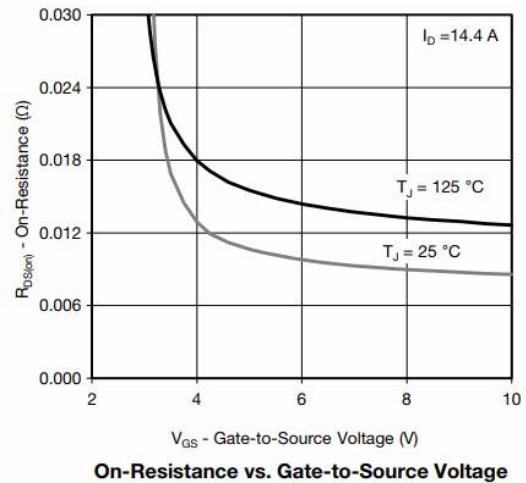
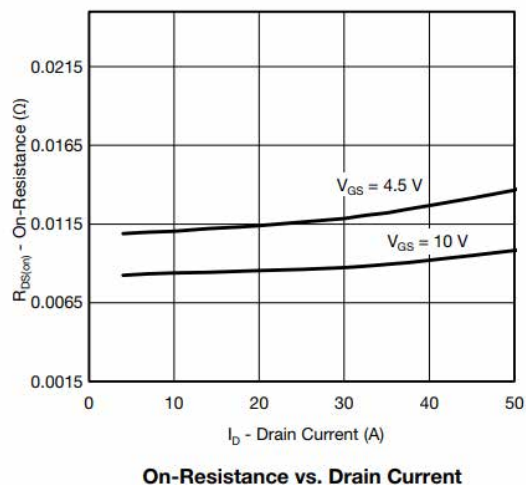
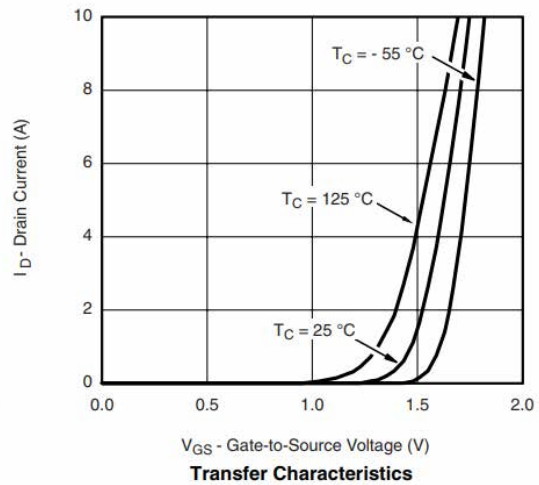
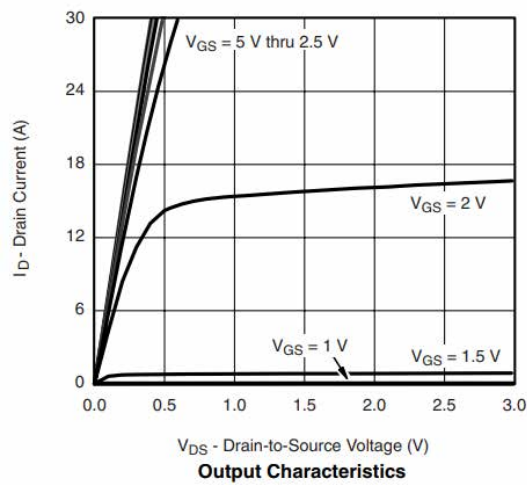
Note:

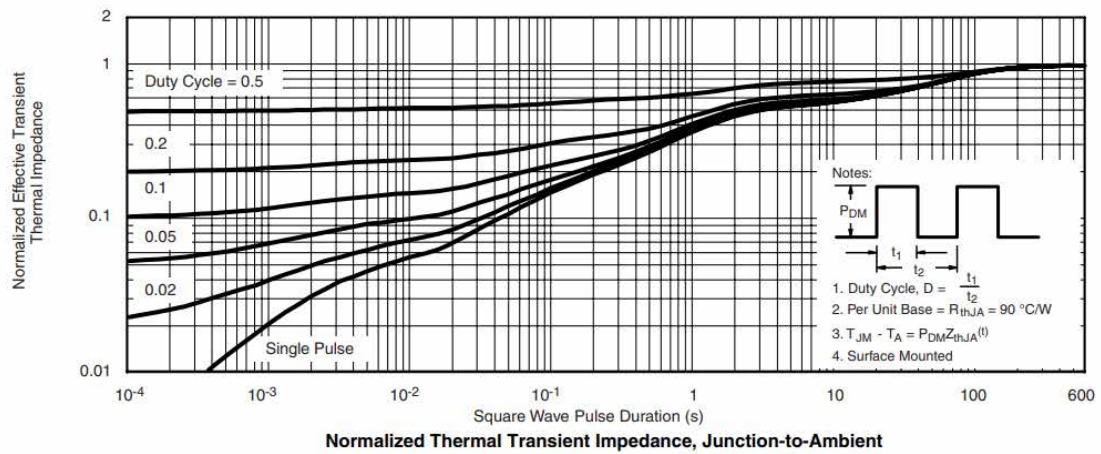
- The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2oz.copper,in a still air environment with $T_A=25^{\circ}\text{C}$.The value in any given application depends on the user is specific board design. The current rating is based on the $t \leq 10\text{s}$ thermal resistance rating.
- Repetitive rating, pulse width limited by junction temperature.
- The power dissipation P_D is based on $T_J(\text{MAX})=150^{\circ}\text{C}$, 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)

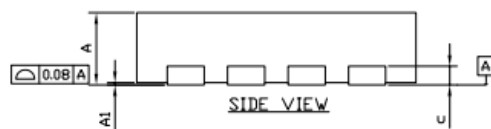
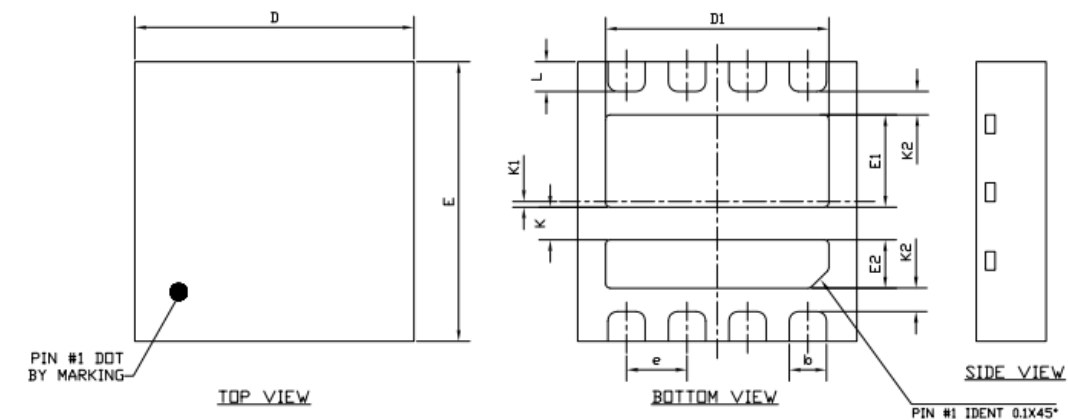
Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.7	0.9	V
$R_{DS(on)}$	Drain-Source On- Resistance	$V_{GS}=10V, I_D=20A$		5.2	6.5	mR
		$V_{GS}=4.5V, I_D=10A$		6.8	8.5	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$			1	μA
I_{GSS}	Gate-Source leak current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
V_{SD}	Forward Voltage	$V_{GS}=0V, I_S=0.5A$		0.8	1.3	V
G_{FS}	Transconductance	$V_{DS}=15V, I_D=10A$		55		S
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		650		pF
C_{oss}	Output Capacitance			220		
C_{rss}	Reverse Transfer Capacitance			105		
$T_{D(ON)}$	Turn-on delay time	$V_{GS}=10V,$ $V_{DS}=15V, R_G=3R, R_L=2.3R$		12		ns
T_r	Rise time			6		
$T_{D(OFF)}$	Turn-off delay time			22		
T_f	Fall time			9		
Q_g	Total Gate charge	$V_{GS}=10V, V_{DS}=15V, I_D=12A$		18		nC
Q_{gs}	Gate to Source charge			2.3		
Q_{gd}	Gate to Drain charge			3.2		

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





➤ Package Information



DFN3X3

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.032
A1	0.00	---	0.05	0.000	---	0.002
c	0.203 REF.			0.008 REF.		
b	0.35	0.40	0.45	0.014	0.016	0.018
D	2.90	3.00	3.10	0.114	0.118	0.122
D1	2.30	2.40	2.50	0.090	0.094	0.098
E	2.90	3.00	3.10	0.114	0.118	0.122
E1	0.89	0.99	1.09	0.035	0.039	0.043
E2	0.42	0.52	0.62	0.016	0.020	0.024
e	0.65 BSC			0.026 BSC		
L	0.27	0.32	0.37	0.011	0.013	0.015
K	0.35 REF.			0.014 REF.		
K1	0.06 REF.			0.002 REF.		
K2	0.25 REF.			0.010 REF.		