HM40SDN02Q

Dual Asymmetric N-Channel Enhancement Mode MOSFET

➢ Features

VDS	VGS	RDSON Typ.	ID
20V	±20V	5.2mR@10V	40A
		6.8mR@4V5	

➢ Description

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

➢ Applications

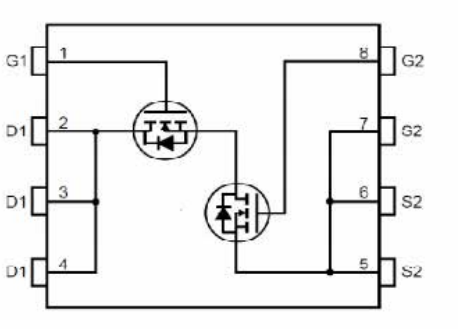
- Power Management in notebook computer
- Portable Equipment
- Battery Powered Systems

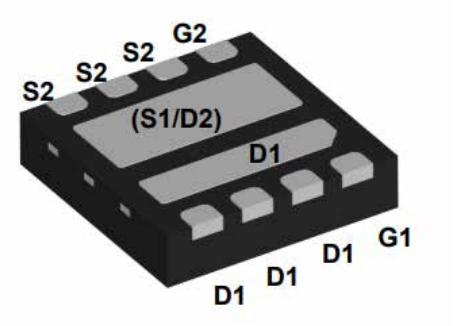
➢ Ordering Information

Device	Package	Shipping
HM40SDN02Q	DFN3X3	5000/Reel

➢ Pin configuration

Top view





Bottom View

Marking

➢ Absolute Maximum Ratings(T_A=25℃ 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=25C°	40	A
		TC=100C°	28	A
I_{DM}	Pulsed Drain Current [b]		120	A
I_{DSM}	Continuous Drain Current [a]	TA=25C°	14	A
		TA=70C°	9	A
P_D	Power Dissipation [c]	TC=25C°	25	W
		TC=100C°	10	W
P_{DSM}	Power Dissipation [a]	TA=25C°	2.5	W
		TA=70C°	0.9	W
I_{AS}	Avalanche Current		40	A
E_{AS}	Avalanche Energy, L=0.05mH		16	mJ
T_J	Operation junction temperature		-55 to 150	℃
T_{STG}	Storage temperature range		-55 to 150	℃

➢ Thermal Resistance Ratings(T_A=25℃ unless otherwise noted)

Symbol	Parameter	Typical	Maximum	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance [a]		55	℃/W
$R_{\theta JC}$	Junction-to-Case Thermal Resistance		6	

Note:

a. The value of RθJA is measured with the device mounted on 1 in^2 FR-4 board with 2oz.copper,in a still air environment with TA=25℃.The value in any given application depends on the user is specific board design. The current rating is based on the t≤10s thermal resistance rating.

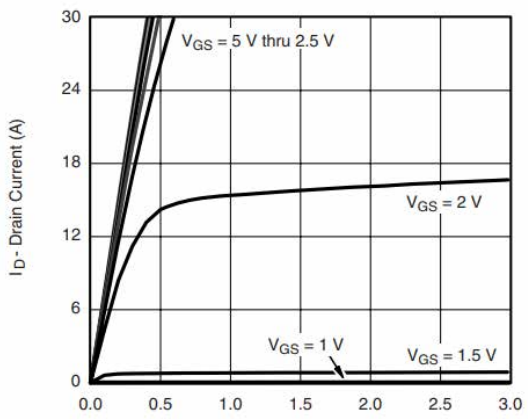
b. Repetitive rating, pulse width limited by junction temperature.

c. The power dissipation PD is based on TJ(MAX)=150°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.

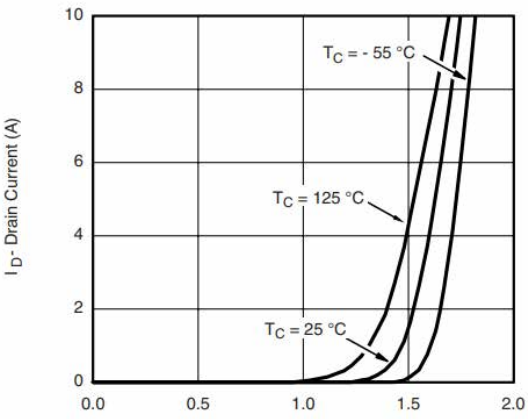
➢ **Electronics Characteristics**(T_A=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	VGS=0V,ID=250uA	20			V
$V_{GS\ (th)}$	Gate Threshold Voltage	VDS=VGS,ID=250uA	0.5	0.7	0.9	V
$R_{DS(on)}$	Drain-Source On-Resistance	VGS=10V,ID=20A		5.2	6.5	mR
		VGS=4.5V,ID=10A		6.8	8.5	
I_{DSS}	Zero Gate Voltage Drain Current	VDS=20V,VGS=0V			1	uA
I_{GSS}	Gate-Source leak current	VGS=±20V,VDS=0V			±100	nA
V_{SD}	Forward Voltage	VGS=0V,IS=0.5A		0.8	1.3	V
G_{FS}	Transconductance	VDS=15V,ID=10A		55		S
Ciss	Input Capacitance	VDS=15V, VGS=0V, f=1MHz		650		pF
Coss	Output Capacitance			220		
Crss	Reverse Transfer Capacitance			105		
$T_{D(ON)}$	Turn-on delay time	VGS=10V, VDS=15V, RG=3R,RL=2.3R		12		ns
Tr	Rise time			6		
$T_{D(OFF)}$	Turn-off delay time			22		
Tf	Fall time			9		
Qg	Total Gate charge	VGS=10V, VDS=15V, ID=12A		18		nC
Qgs	Gate to Source charge			2.3		
Qgd	Gate to Drain charge			3.2		

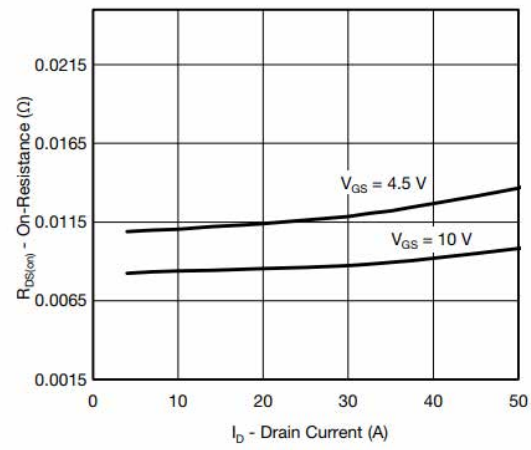
➢ **Typical Characteristics**(T_A=25℃ unless otherwise noted)



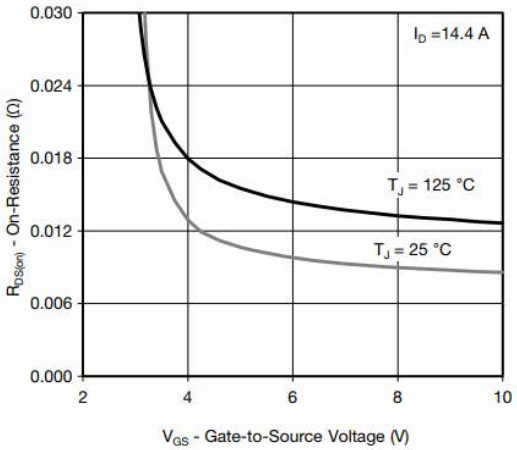
Output Characteristics



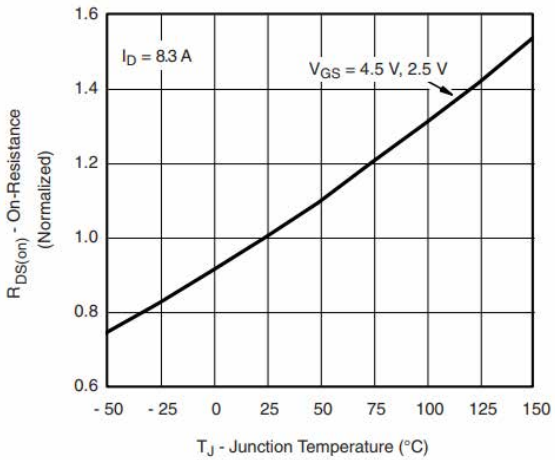
Transfer Characteristics



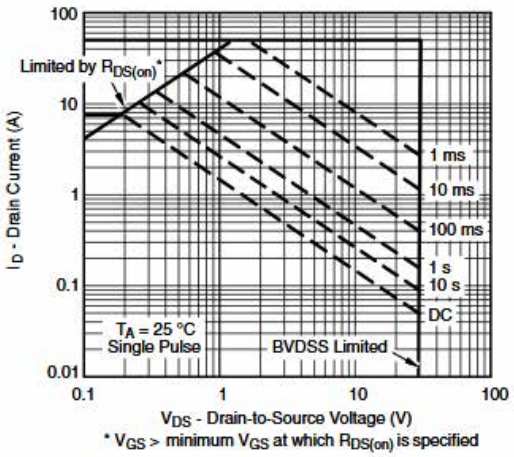
On-Resistance vs. Drain Current



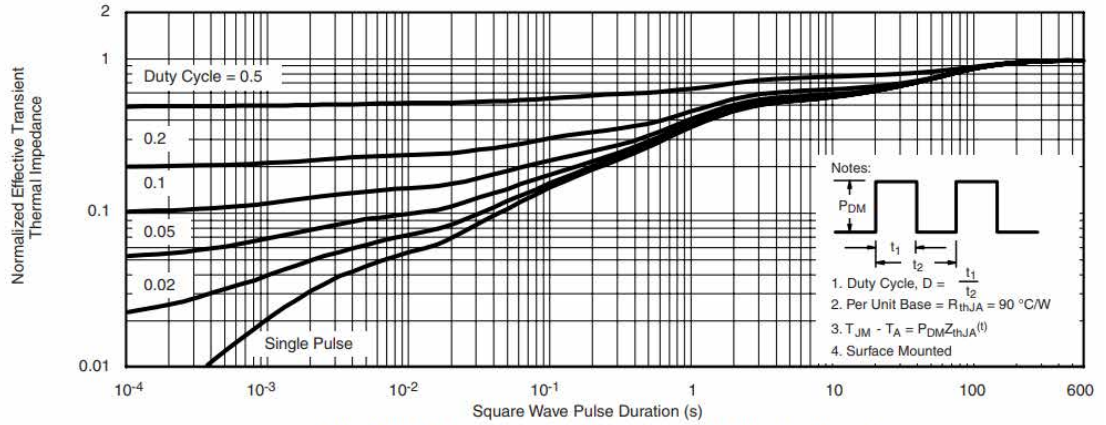
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Junction Temperature

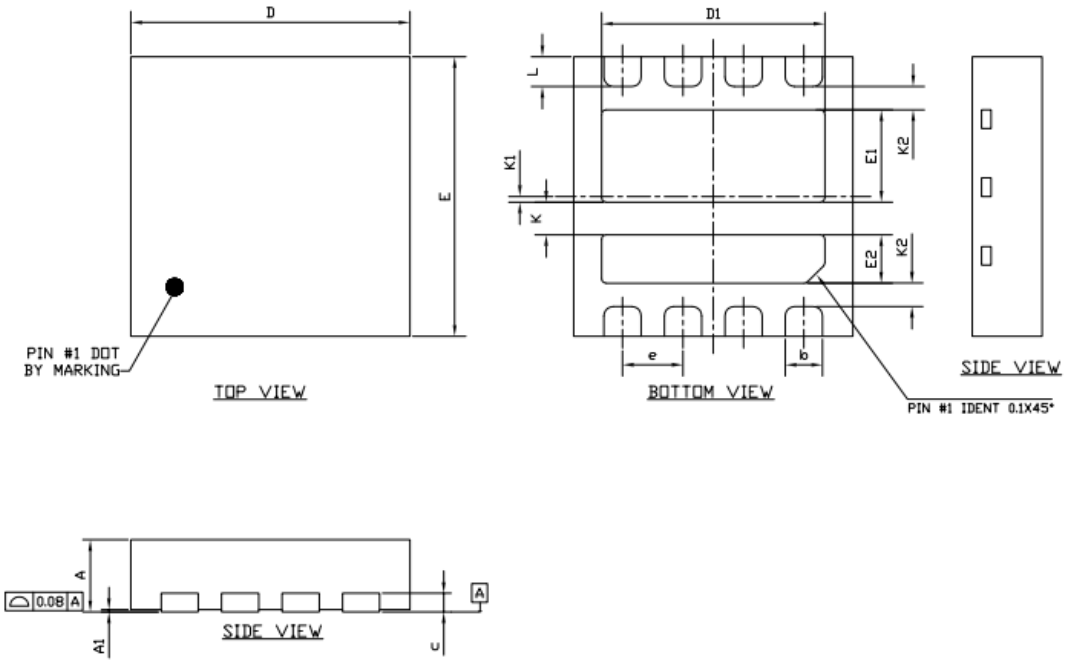


Safe Operating Area, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

➢ 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.		