HM5853

P-Channel Enhancement Mode MOSFET with Schottky Diode

➢ Features

P-Channel

VDS	VGS	RDSON Typ.	ID
-20V	±8V	130mR@-4V5	-2A
		170mR@-2V5	
		230mR@-1V8	

Schottky

VR	IR	VF Typ.	IO
20V	15uA	410mV @0.5A	1A

➢ Description

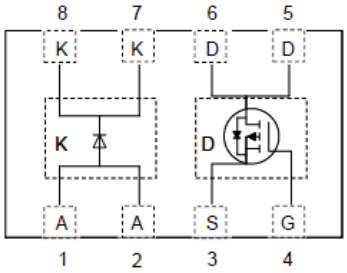
HM5853 combines an P-Channel enhancement mode power MOSFET which is produced with high cell density and DMOS trench technology and a low forward voltage schottky diode. The tiny and thin outline saves PCB consumption.

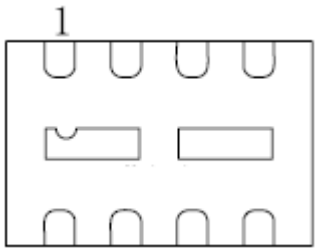
➢ Applications

- Li-Battery Charging
- High Side DC/DC Converter
- High Side Driver for Brushless DC motor
- Power Management in Portable, Battery Powered Devices

➢ Pin configuration

Top view





Bottom View

Marking

➢ Ordering Information

Device	Package	Shipping
HM5853	DFN3X2	3000/Reel

➢ **Absolute Maximum Ratings**(T_A=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Unit
P-MOS			
V_{DSS}	Drain-to-Source Voltage	-20	V
V_{GSS}	Gate-to-Source Voltage	±8	V
I_D	Continuous Drain Current	-2	A
I_{DM}	Pulsed Drain Current	-8	A
Schottky Diode			
V_R	Schottky Reverse Voltage	20	V
I_F	Schottky Continuous Forward Current	1	A
Power Dissipation and Temperature			
P_D	Power Dissipation	2.2	W
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)

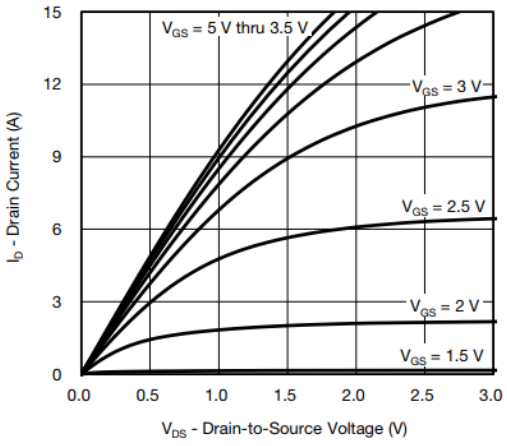
Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance	59	℃/W

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

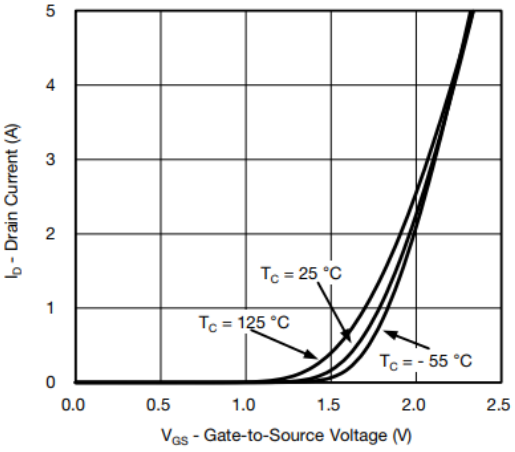
Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
Schottky						
BV	Reverse Breakdown Voltage	IR=100uA	20			V
VF	Forward Voltage Drop	IF=0.5A		0.41	0.45	V
IR	Maximum reverse leakage current	VR=20V		15	200	uA

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
P-Channel Enhancement Mode MOSFET						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	VGS=0V , ID=-250uA	-20			V
$V_{GS\ (th)}$	Gate Threshold Voltage	VDS=VGS , ID=-250uA	-0.5	-0.6	-1.2	V
$R_{DS(on)}$	Drain-Source On-Resistance	VGS=-4.5V,ID=-0.5A		130	190	mR
		VGS=-2.5V,ID=-0.5A		170	250	
		VGS=-1.8V,ID=-0.5A		230	500	
I_{DSS}	Zero Gate Voltage Drain Current	VDS=-20V , VGS=0V			-1	uA
I_{GSS}	Gate-Source leak current	VGS=±8V , VDS=0V			±100	nA
G_{FS}	Transconductance	VDS=-10V , ID=-1.7A		7		S
V_{SD}	Forward Voltage	VGS=0V , IS=-1A			1.3	V
Ciss	Input Capacitance	VDS=-10V, VGS=0V, f=1MHZ		476		pF
Coss	Output Capacitance			187		
Crss	Reverse Transfer Capacitance			78		
$T_{D(ON)}$	Turn-on delay time	VDS=-6V, VGS=-4.5V, RL=6R, RG=6R , ID=-1A		19		ns
Tr	Turn-on rise time			31		
$T_{D(OFF)}$	Turn-off delay time			168		
Tf	Turn-off fall time			102		

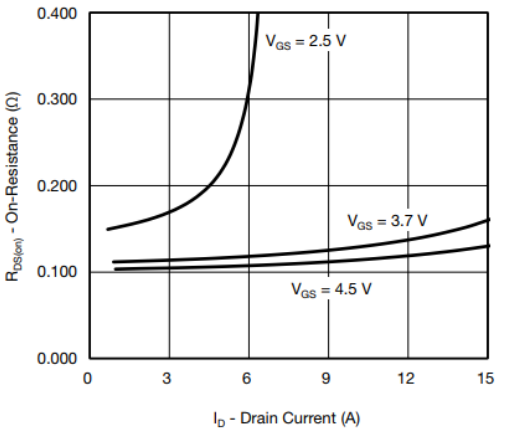
➢ Typical Characteristics(T_A=25℃ unless otherwise noted)



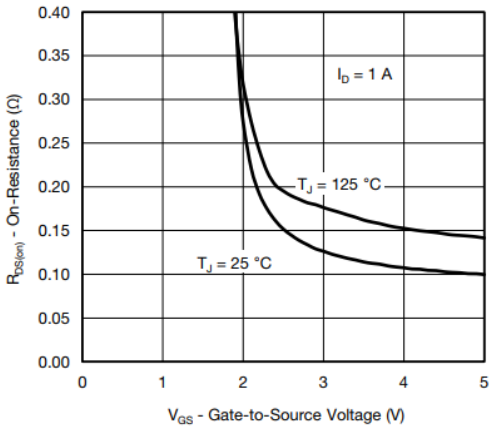
Output Characteristics



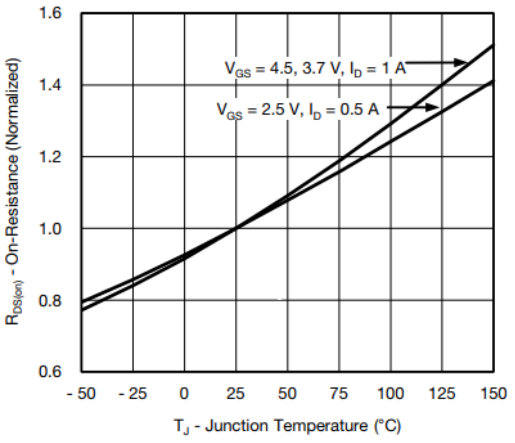
Transfer Characteristics



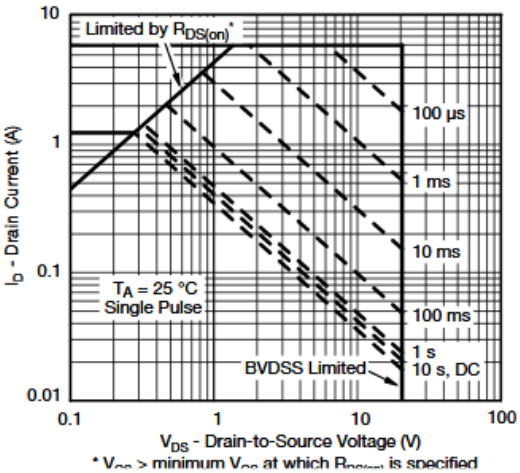
On-Resistance vs. Drain Current and Gate Voltage



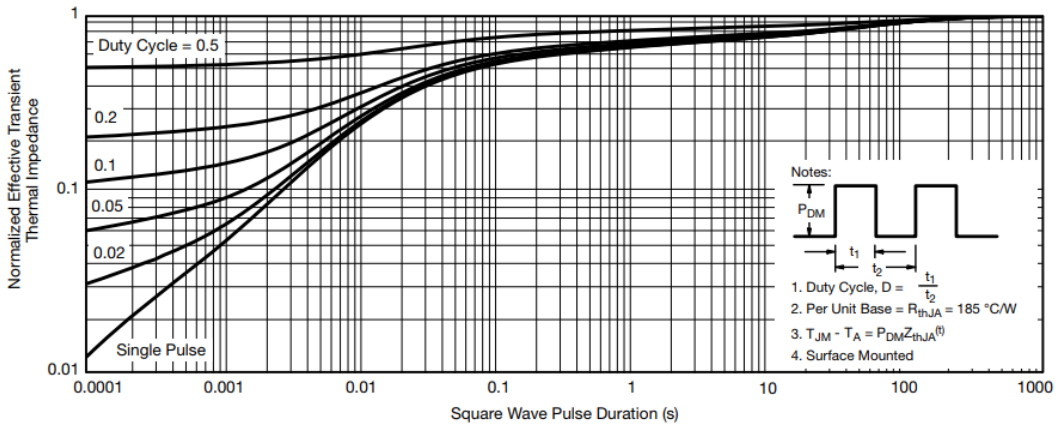
On-Resistance vs. Gate-to-Source Voltage



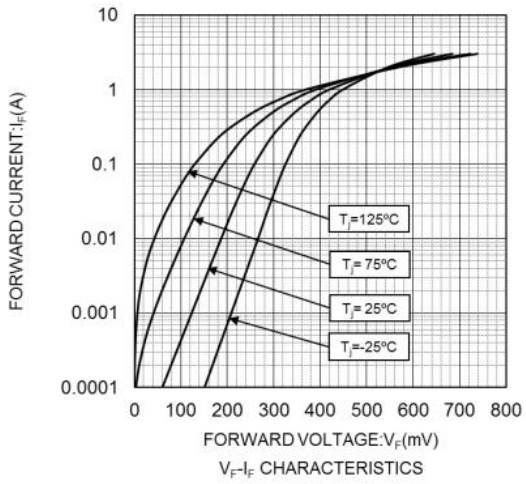
On-Resistance vs. Junction Temperature

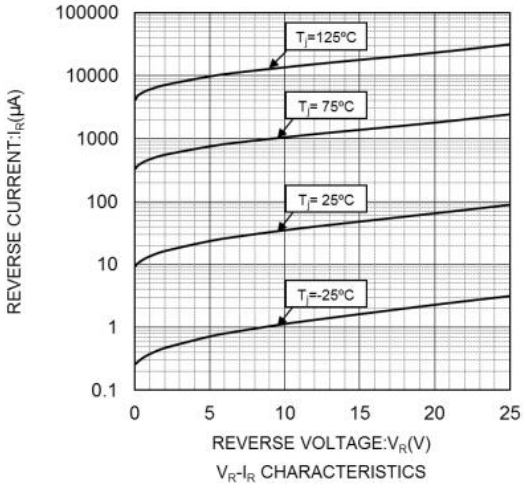


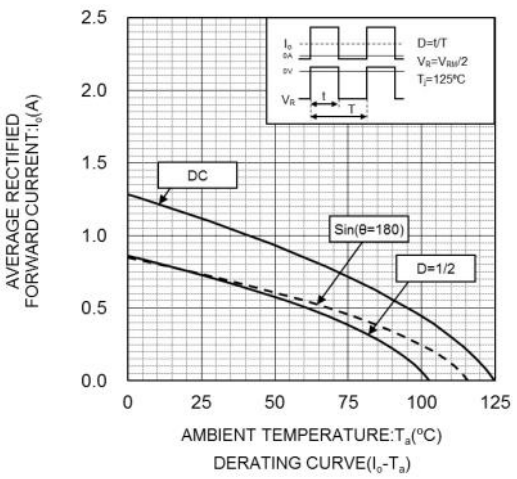
Safe Operating Area, Junction-to-Ambient

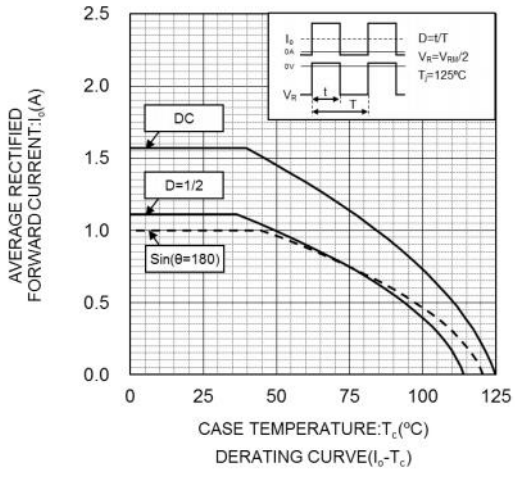


Normalized Thermal Transient Impedance, Junction-to-Ambient

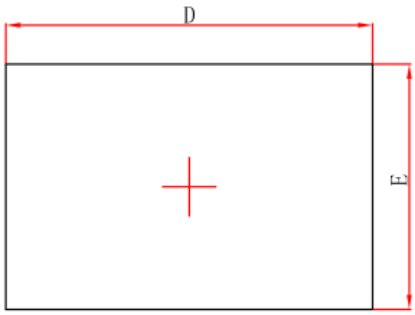




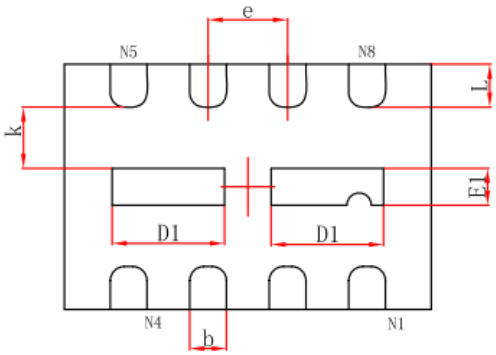




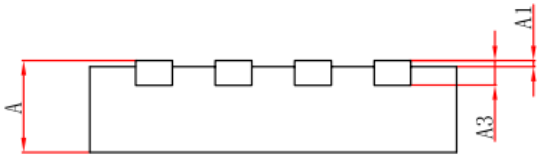
➢ Package Information



Top View



Bottom View



Side View

DFN3X2-8L

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700/0.800	0.800/0.900	0.028/0.031	0.031/0.035
A1	0.000	0.050	0.000	0.002
A3	0.153	0.253	0.006	0.010
D	2.9	3.1	0.114	0.122
E	1.9	2.1	0.075	0.083
D1	0.82	1.020	0.032	0.040
E1	0.200	0.400	0.008	0.016
k	0.300MIN.		0.010MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.250	0.350	0.010	0.014