

Power MOSFET and Schottky Diode

General Description

The HM5853 uses advanced trench technology to provide excellent RDSON and low gate charge. Featuring a MOSFET and Schottky Diode, Independent Pin out to each Device to Ease Circuit Design.

Features

- Leadless SMD Package Featuring a MOSFET and Schottky Diode
- 40% Smaller than TSOP-6 Package
- Leadless SMD Package Provides Great Thermal Characteristics
- Independent Pinout to each Device to Ease Circuit Design
- Trench P-Channel for Low On Resistance
- Ultra Low VF Schottky
- Pb-Free Packages are Available

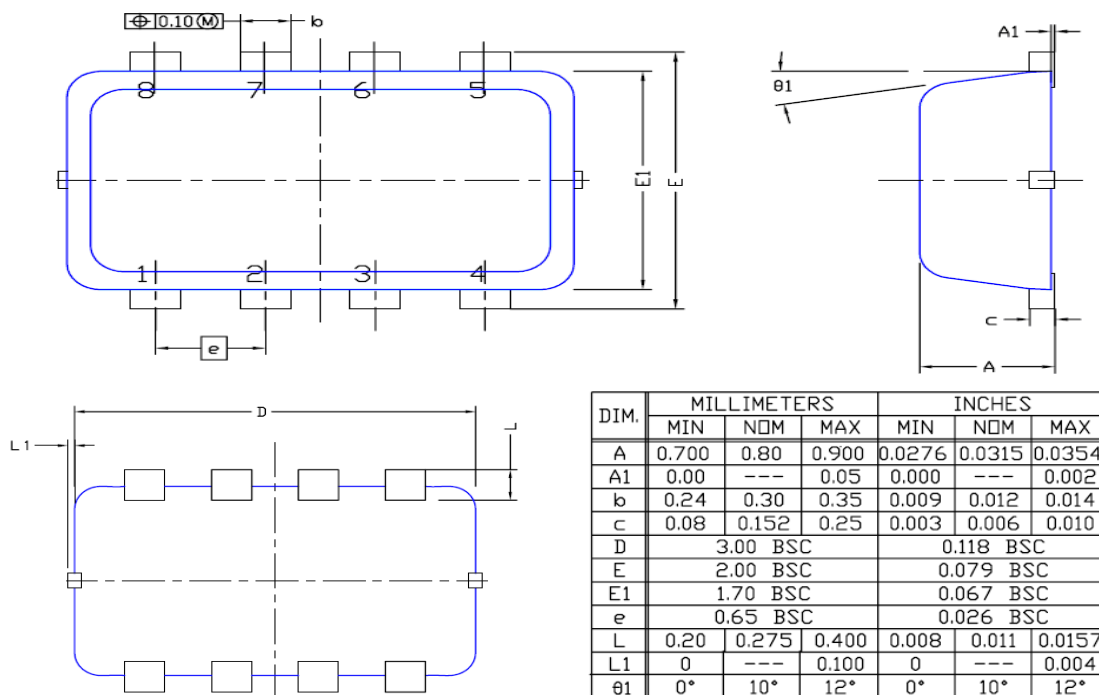
MOSFET		
$V_{(BR)DSS}$	$R_{DS(ON)}$ TYP	I_D MAX
-22V	79mΩ@-4.5V	-3A
	110mΩ@-2.5V	
SHOTTKY DIODE		
V_R MAX	V_F TYP	I_F MAX
20V	0.47V	3A

Applications

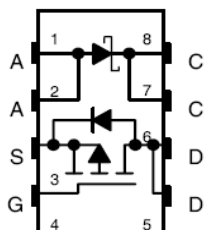
- Li-Ion Battery Charging
- High Side DC-DC Conversion Circuits
- High Side Drive for Small Brushless DC Motors
- Power Management in Portable, Battery Powered Products

Package Information

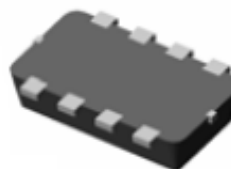
DFN3x2-8L PAXKAGE OUTLINE DIMENSIONS



PIN CONFIGURATION

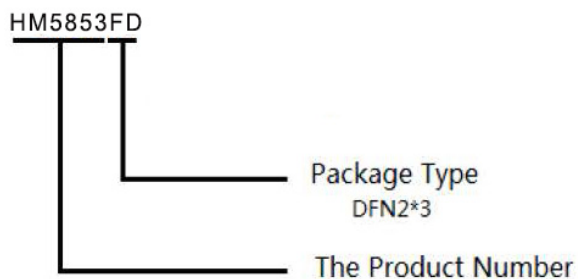


Pin connections



DFN2x3-8L

Ordering Information



● **Absolute Maximum Ratings** (TA = 25°C unless otherwise noted)

Parameter	symbol	value	units
Drain-Source voltage	$V_{(BR)DSS}$	-22	V
Gate-Source Voltage	V_{GS}	8	V
Continuous Drain Current	I_D	-3.0	A
Drain Current-Pulsed	I_{DM}	-12	A
Power Dissipation	P_D	1.1	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{stg}	-55~150	°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	110	°C/W

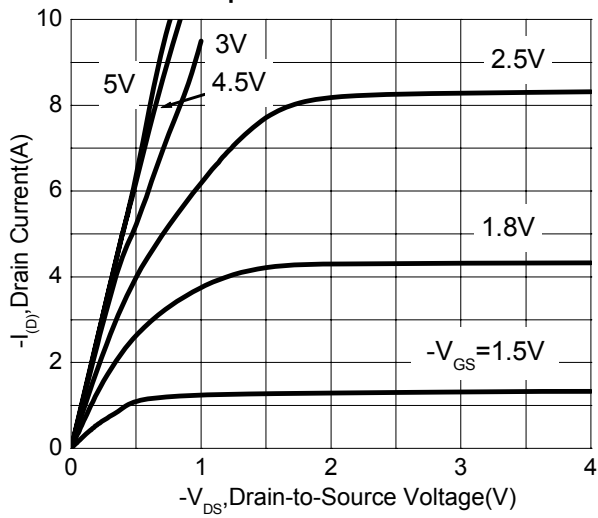
Electrical Characteristics (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250uA	-20			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250uA	-0.5	-0.69	-1	V
Gate-Body Leakage	I _{GSS}	V _{DS} =0V, V _{GS} =8V		5	100	nA
		V _{DS} =0V, V _{GS} =-8V		-6	-100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V V _{GS} =0V		6	100	nA
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-4.5V,I _D =-3.4A		79	115	mΩ
		V _{GS} =-2.5V,I _D =-2.5A		110	145	mΩ
		V _{GS} =-1.8V,I _D =-1.5A		215	250	mΩ
Forward Transconductance	g _{FS}	V _{DS} = 5V,I _D =4.5A		10		S
Source-drain (diode forward) voltage	V _{SD}	V _{GS} =0V,I _D =0.9A		0.62	1.0	V
Dynamic Characteristics						
Input Capacitance	Ciss	V _{DS} =8 V, V _{GS} =0 V, F=1MHz		580		pF
Output Capacitance	Coss			110		
Reverse Transfer Capacitance	Crss			70		
Switching Characteristics						
Turn-On Delay Time	td(on)	V _{DD} =10 V, R _L =10 Ω I _D =1 A, V _{GEN} =4.5 V, Rg=6 Ω		8	20	ns
Rise Time	tr			10	25	
Turn-Off Delay Time	td(off)			35	70	
Fall-Time	tf			30	60	
Total Gate Charge	Qg	V _{DS} =10 V, V _{GS} =4.5 V, I _D =6A		10	15	nc
Gate-Source Charge	Qgs			2.3		
Gate-Drain Charge	Qgd			2.9		

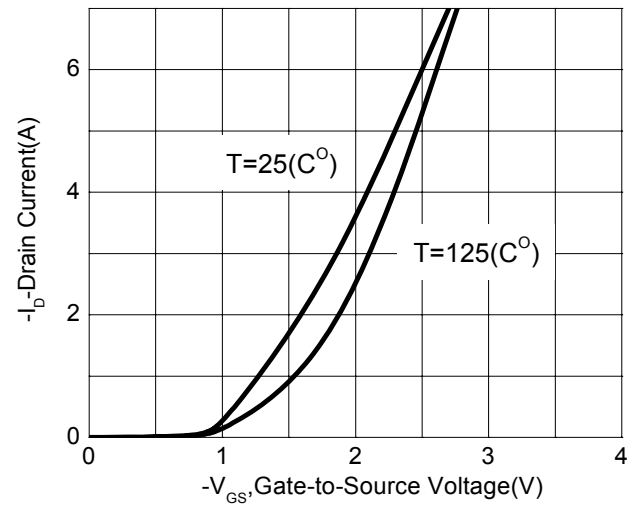
SCHOTTKY DIODE ELECTRICAL CHARACTERISTICS (Tj=25°C, Unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Forward voltage	V_F	$I_F=0.1A$		0.42		V
		$I_F=0.5A$		0.47		
		$I_F=1A$		0.53		
Reverse current	I_R	$V_R=10V$		1.5	4	μA
		$V_R=20V$		2.3	10	

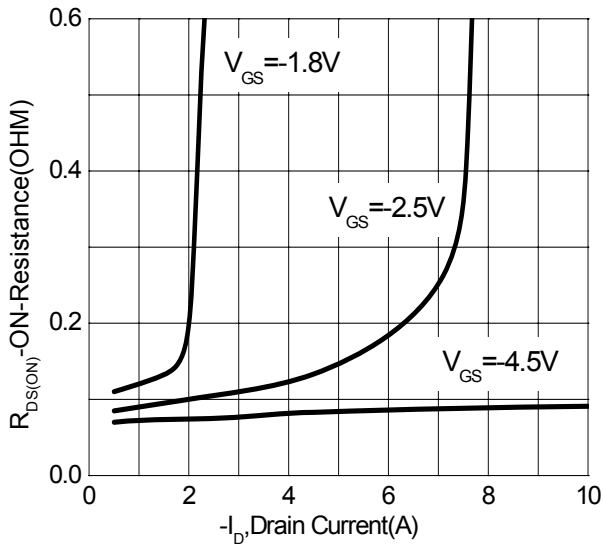
Output Characteristics



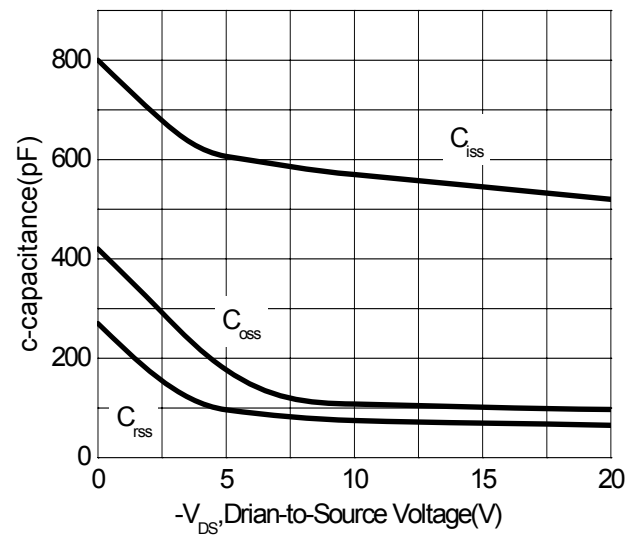
Transfer Characteristics



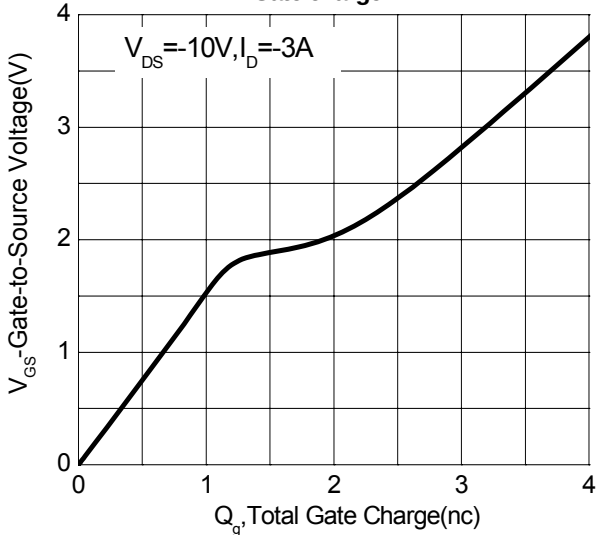
ON-Resistance VS. Drain Current



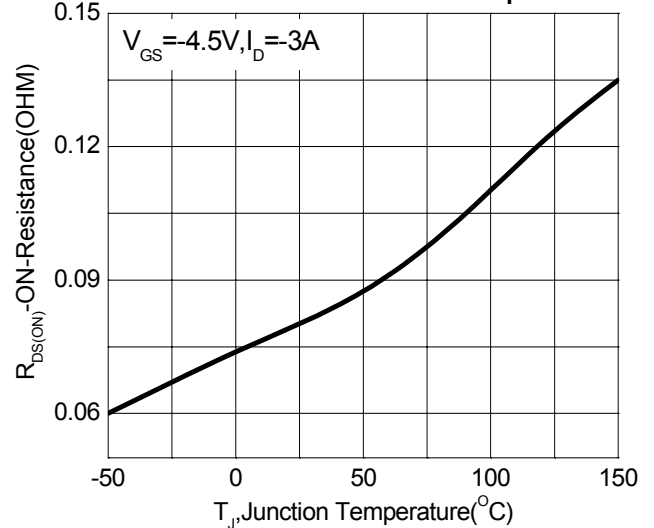
Capacitance



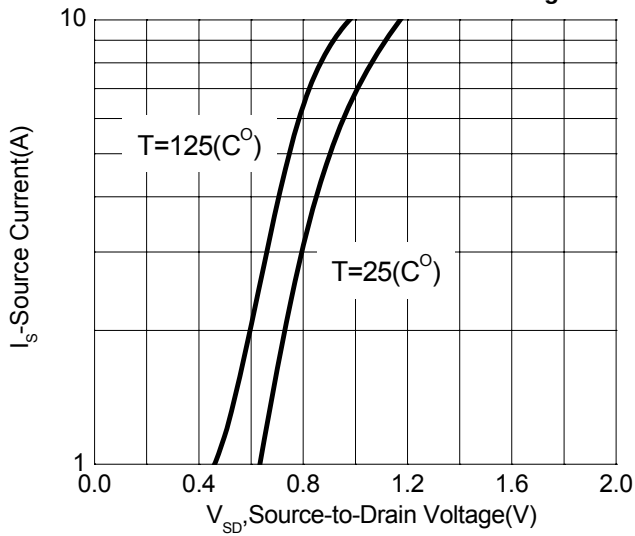
Gate charge



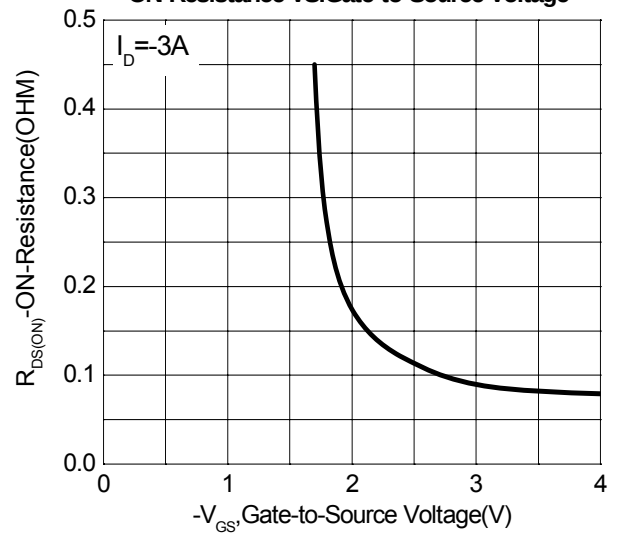
ON-Resistance VS. Junction Temperature



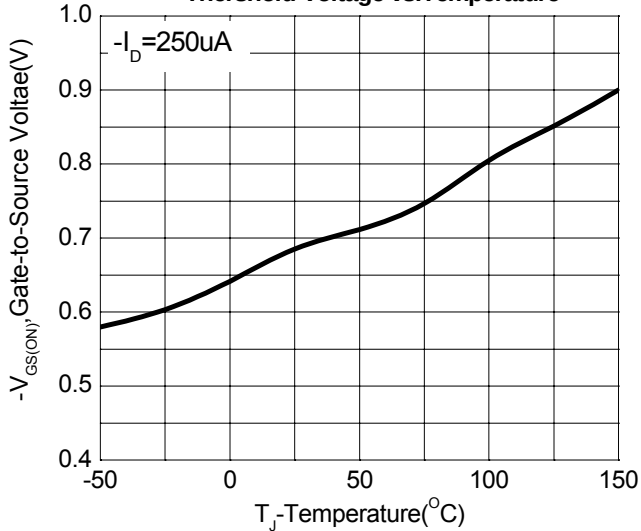
Source-Drain Diode Forward Voltage



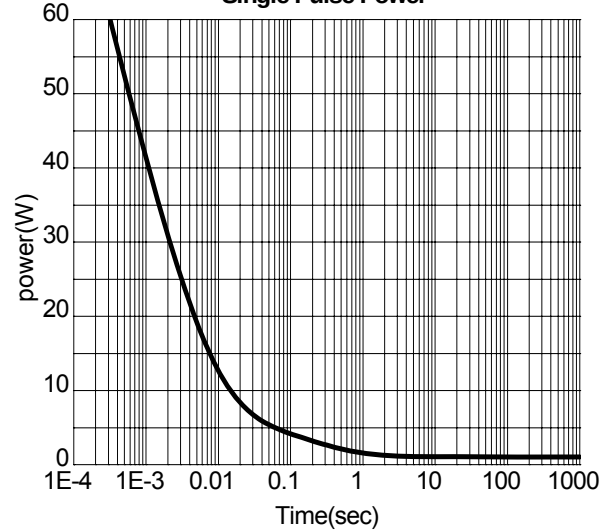
ON-Resistance VS. Gate-to-Source Voltage



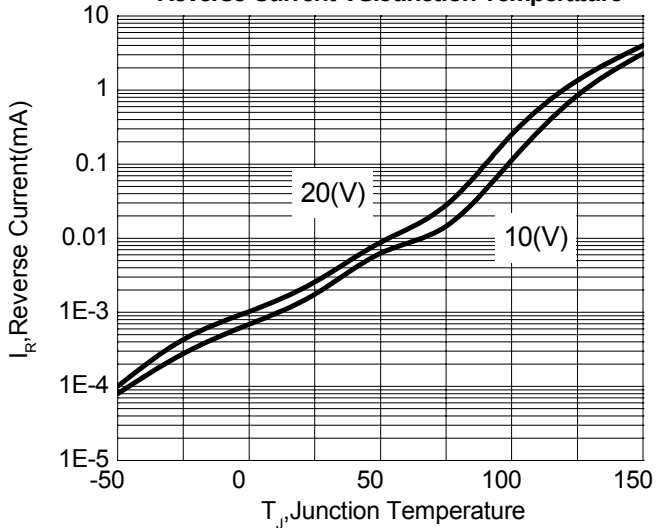
Threshold Voltage vs. Temperature



Single Pulse Power



Reverse Current VS. Junction Temperature



Schottky Capacitance Characteristics

