

P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A)
-20	0.054 @ V _{GS} = -4.5 V	-5.9
	0.075 @ V _{GS} = -2.5 V	-5.0

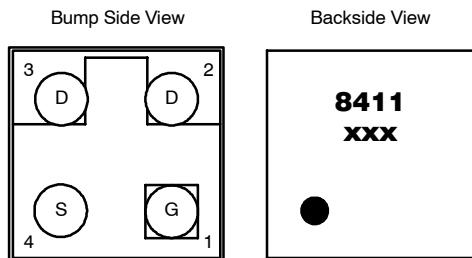
FEATURES

- TrenchFET® Power MOSFET
- New MICRO FOOT® Chipscale Packaging
Reduces Footprint Area Profile (0.62 mm) and On-Resistance Per Footprint Area

APPLICATIONS

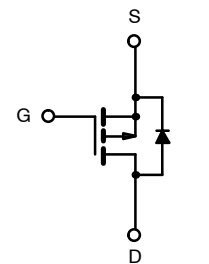
- Load Switch
- Battery Switch
- Charger Switch
- PA Switch

MICRO FOOT



Device Marking: 8411
xxx = Date/Lot Traceability Code

Ordering Information: Si8411DB-T1



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 secs	Steady State	Unit	
Drain-Source Voltage	V _{DS}	-20		V	
Gate-Source Voltage	V _{GS}	±12			
Continuous Drain Current (T _J = 150°C) ^a	I _D	T _A = 25°C	-5.9	-4.3	A
		T _A = 70°C	-4.7	-3.4	
Pulsed Drain Current	I _{DM}	-25		A	
continuous Source Current (Diode Conduction) ^a	I _S	-2.5	-1.3		
Maximum Power Dissipation ^a	P _D	T _A = 25°C	2.77	1.47	W
		T _A = 70°C	1.77	0.94	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150		°C	
Package Reflow Conditions ^b	VPR	215			
	IR/Convection	220			

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R _{thJA}	t ≤ 5 sec	35	45	°C/W
		Steady State	72	85	
Maximum Junction-to-Foot (drain)	R _{thJF}	16	20		

Notes

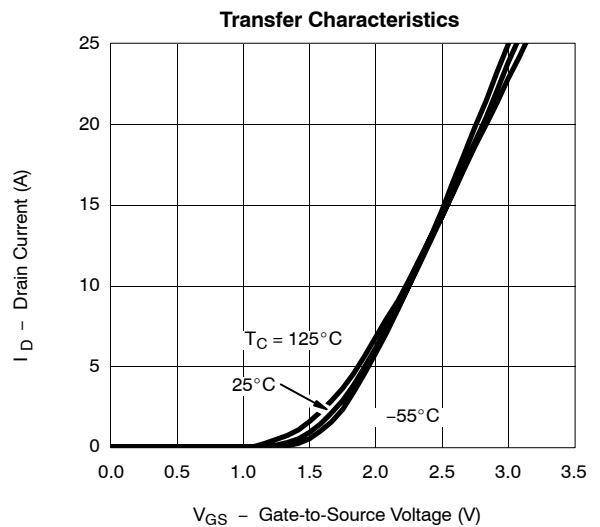
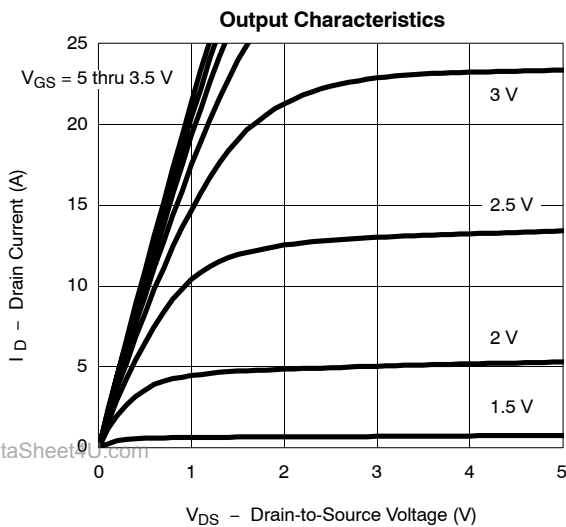
- Surface Mounted on 1" x 1" FR4 Board.
- Refer to IPC/JEDEC (J-STD-020A), no manual or hand soldering.

SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-0.6		-1.4	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±12 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -20 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -20 V, V _{GS} = 0 V, T _J = 70 °C			-5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≤ -5 V, V _{GS} = -4.5 V	-5			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = -4.5 V, I _D = -1 A		0.045	0.054	Ω
		V _{GS} = -2.5 V, I _D = -1 A		0.065	0.075	
Forward Transconductance ^a	g _{fs}	V _{DS} = -10 V, I _D = -1 A		7		S
Diode Forward Voltage ^a	V _{SD}	I _S = -1 A, V _{GS} = 0 V		-0.8	-1.1	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = -10 V, V _{GS} = -4.5 V, I _D = -1 A		14	21	nC
Gate-Source Charge	Q _{gs}			1.7		
Gate-Drain Charge	Q _{gd}			5.1		
Gate Resistance	R _g			18		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = -10 V, R _L = 10 Ω I _D ≅ -1 A, V _{GEN} = -4.5 V, R _G = 6 Ω		31	50	ns
Rise Time	t _r			50	75	
Turn-Off Delay Time	t _{d(off)}			105	160	
Fall Time	t _f			90	135	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = -1 A, di/dt = 100 A/μs		85	130	

Notes

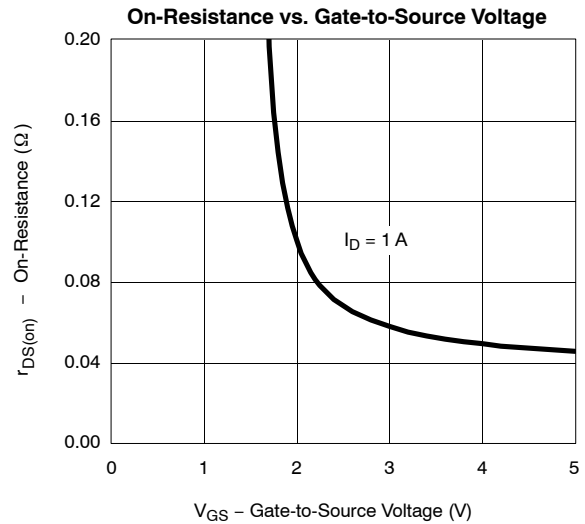
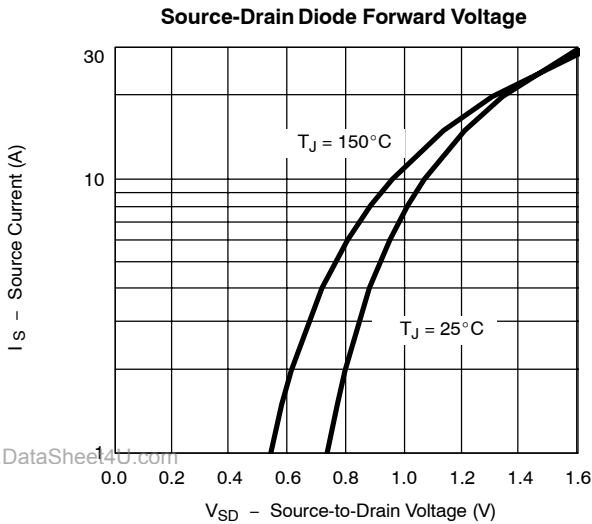
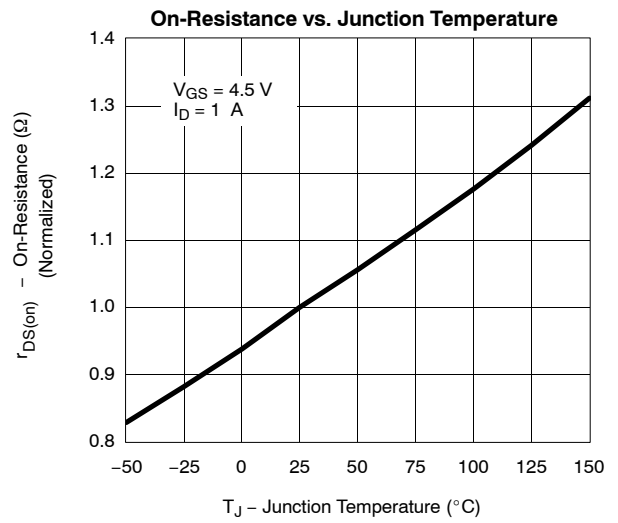
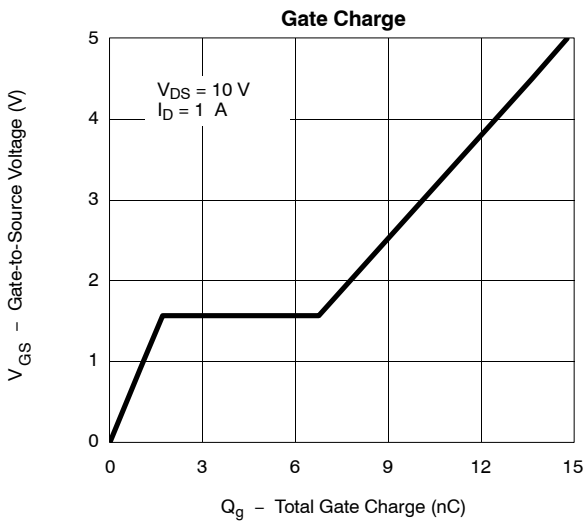
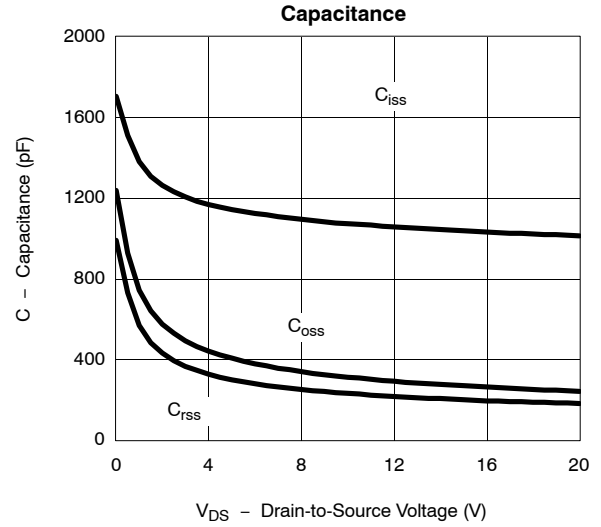
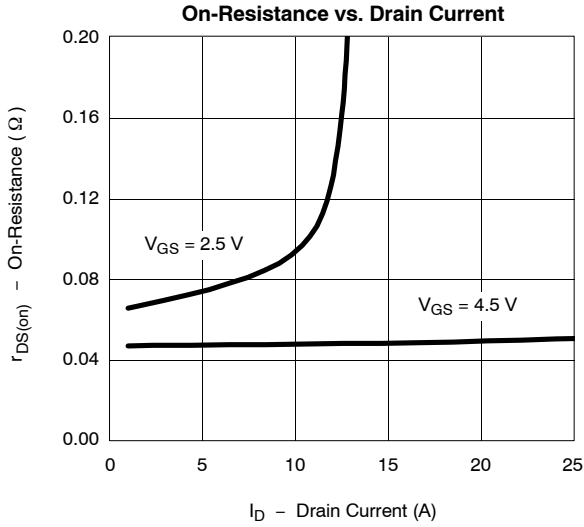
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

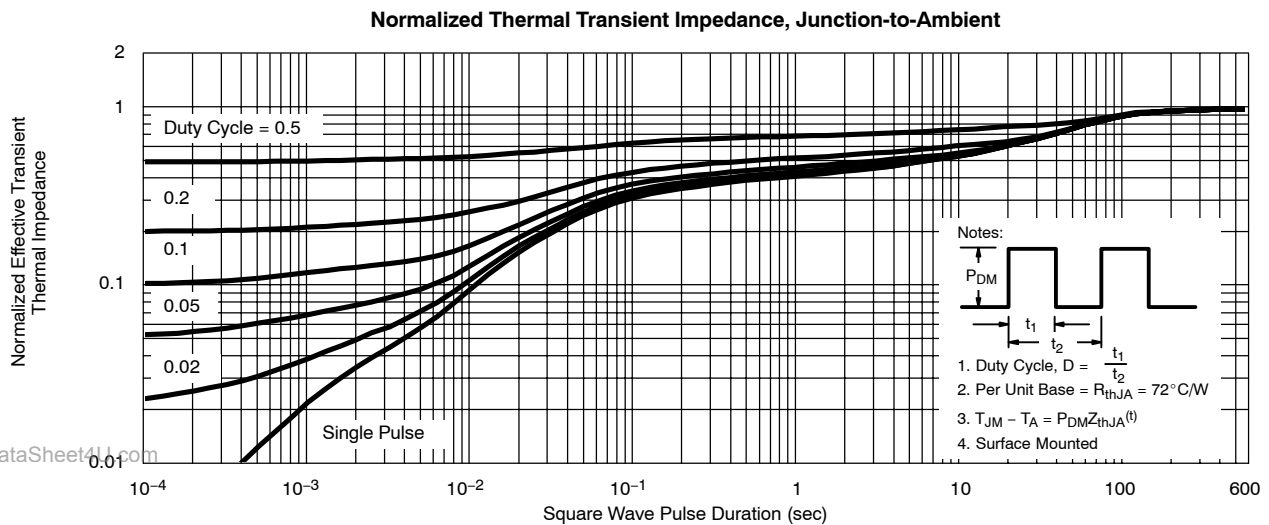
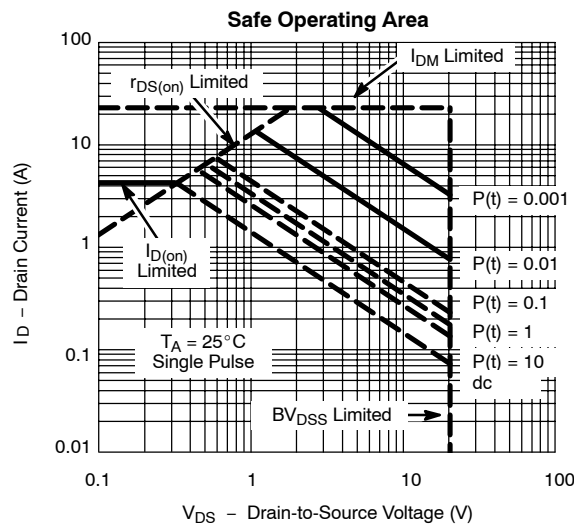
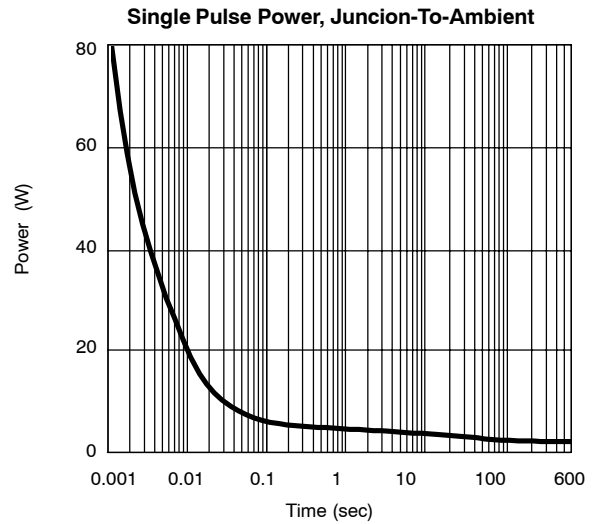
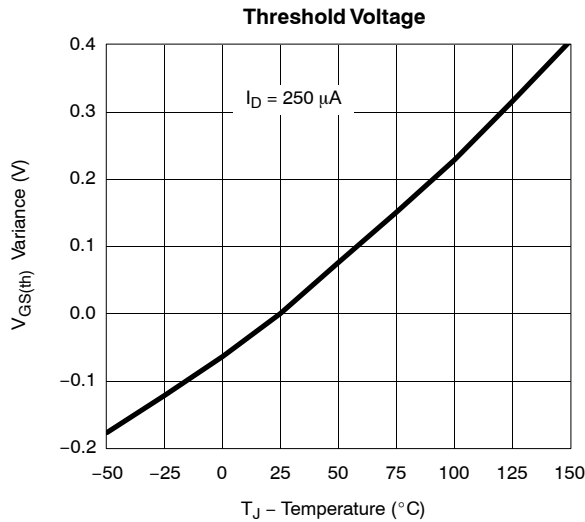




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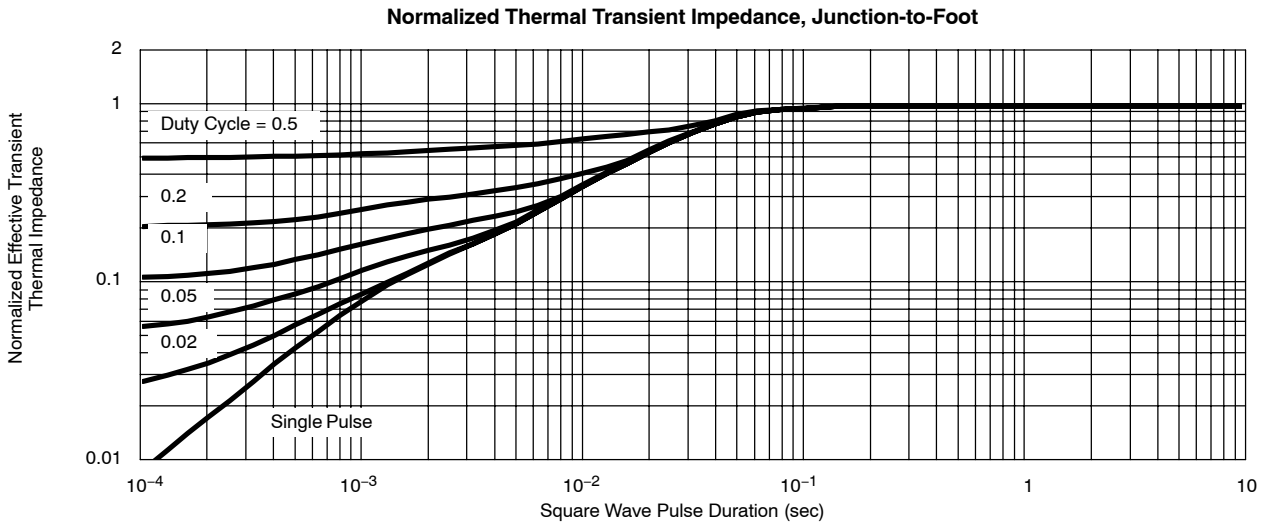


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



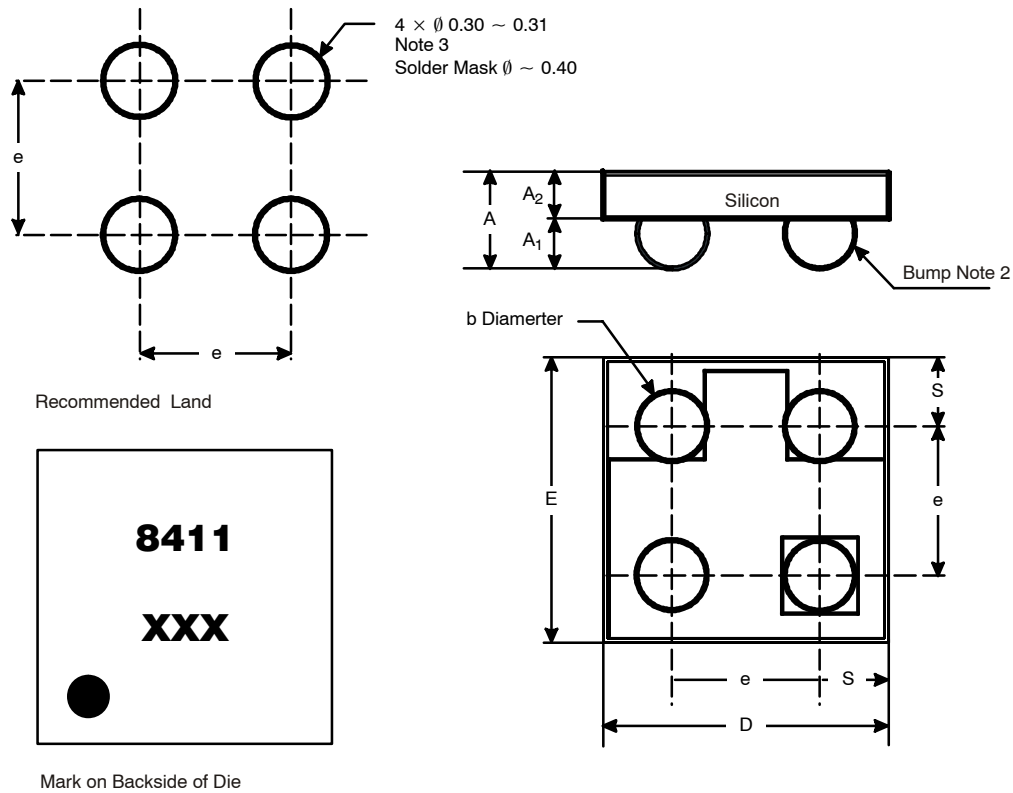


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



PACKAGE OUTLINE

MICRO FOOT: 4-BUMP (2 X 2, 0.8-mm PITCH)



NOTES (Unless Otherwise Specified):

1. Laser mark on the silicon die back, coated with a thin metal.
2. Bumps are Eutectic solder 63/57 Sn/Pb.
3. Non-solder mask defined copper landing pad.
4. The flat side of wafers is oriented at the bottom.

Dim	MILLIMETERS*		INCHES	
	Min	Max	Min	Max
A	0.600	0.650	0.0236	0.0256
A ₁	0.260	0.290	0.0102	0.0114
A ₂	0.340	0.360	0.0134	0.0142
b	0.370	0.410	0.0146	0.0161
D	1.520	1.600	0.0598	0.0630
E	1.520	1.600	0.0598	0.0630
e	0.750	0.850	0.0295	0.0335
S	0.370	0.380	0.0146	0.0150

* Use millimeters as the primary measurement.