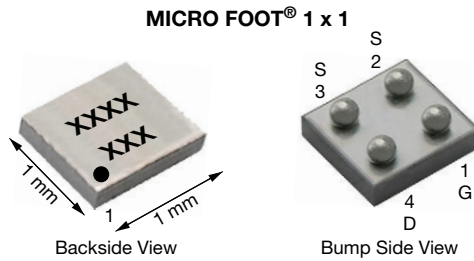




**THE DATASHEET OF
SI8466EDB-T2-E1**



N-Channel 8 V (D-S) MOSFET



Marking code: xxxx = 8466

PRODUCT SUMMARY	
V_{DS} (V)	8
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 4.5$ V	0.043
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 2.5$ V	0.046
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 1.5$ V	0.060
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 1.2$ V	0.090
Q_g typ. (nC)	6.8
I_D (A) ^{a, e}	5.4
Configuration	Single

FEATURES

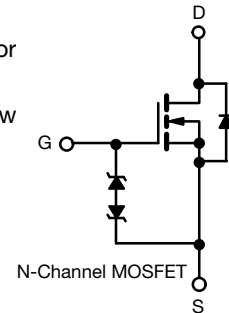
- TrenchFET[®] power MOSFET
- Typical ESD protection 3000 V HBM
- Ultra small 1 mm x 1 mm maximum outline
- Ultra thin 0.548 mm maximum height
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Low on-resistance load switch for portable devices
 - Low power consumption, low voltage drop
 - Increased battery life
 - Space savings on PCB



ORDERING INFORMATION	
Package	MICRO FOOT
Lead (Pb)-free and halogen-free	Si8466EDB-T2-E1

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-source voltage	V_{DS}	8	V
Gate-source voltage	V_{GS}	± 5	
Continuous drain current ($T_J = 150$ °C)	I_D	$T_A = 25$ °C	5.4 ^a
		$T_A = 70$ °C	4.4 ^a
		$T_A = 25$ °C	3.6 ^b
		$T_A = 70$ °C	2.9 ^b
Pulsed drain current ($t = 300$ μ s)	I_{DM}	20	A
Continuous source-drain diode current	I_S	$T_C = 25$ °C	
		$T_A = 25$ °C	0.65 ^b
Maximum power dissipation	P_D	$T_A = 25$ °C	1.8 ^a
		$T_A = 70$ °C	1.1 ^a
		$T_A = 25$ °C	0.78 ^b
		$T_A = 70$ °C	0.5 ^b
Operating junction and storage temperature range	T_J, T_{stg}	-55 to +150	°C
Package reflow conditions ^c	VPR	260	
	IR/convection	260	

THERMAL RESISTANCE RATINGS					
PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum junction-to-ambient ^{f, g}	$t = 10$ s	R_{thJA}	55	70	°C/W
Maximum junction-to-ambient ^{h, i}	$t = 10$ s		125	160	

Notes

- Surface mounted on 1" x 1" FR4 board with full copper, $t = 10$ s
- Surface mounted on 1" x 1" FR4 board with minimum copper, $t = 10$ s
- Refer to IPC/JEDEC[®] (J-STD-020), no manual or hand soldering
- In this document, any reference to case represents the body of the MICRO FOOT device and foot is the bump
- Based on $T_A = 25$ °C
- Surface mounted on 1" x 1" FR4 board with full copper
- Maximum under steady state conditions is 100 °C/W
- Surface mounted on 1" x 1" FR4 board with minimum copper
- Maximum under steady state conditions is 190 °C/W



SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V_{DS}	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	8	-	-	V
V_{DS} temperature coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\text{ }\mu\text{A}$	-	3.5	-	mV/ $^\circ\text{C}$
$V_{GS(th)}$ temperature coefficient	$\Delta V_{GS(th)}/T_J$		-	-3	-	
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	0.35	-	0.7	V
Gate-source leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 5\text{ V}$	-	-	± 3	μA
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 8\text{ V}$, $V_{GS} = 0\text{ V}$	-	-	1	μA
		$V_{DS} = 8\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 70\text{ }^\circ\text{C}$	-	-	10	
On-state drain current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = 4.5\text{ V}$	10	-	-	A
Drain-source on-state resistance ^a	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}$, $I_D = 2\text{ A}$	-	0.035	0.043	Ω
		$V_{GS} = 2.5\text{ V}$, $I_D = 1\text{ A}$	-	0.037	0.046	
		$V_{GS} = 1.5\text{ V}$, $I_D = 1\text{ A}$	-	0.045	0.060	
		$V_{GS} = 1.2\text{ V}$, $I_D = 0.5\text{ A}$	-	0.055	0.090	
Forward transconductance ^a	g_{fs}	$V_{DS} = 4\text{ V}$, $I_D = 2\text{ A}$	-	30	-	S
Dynamic ^b						
Input capacitance	C_{ISS}	$V_{DS} = 4\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$	-	710	-	pF
Output capacitance	C_{OSS}		-	270	-	
Reverse transfer capacitance	C_{RSS}		-	192	-	
Total gate charge	Q_g	$V_{DS} = 4\text{ V}$, $V_{GS} = 4.5\text{ V}$, $I_D = 2\text{ A}$	-	8.5	13	nC
Gate-source charge	Q_{GS}		-	0.9	-	
Gate-drain charge	Q_{GD}		-	1.6	-	
Gate resistance	R_g	$V_{GS} = 0.1\text{ V}$, $f = 1\text{ MHz}$	-	6	-	Ω
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 4\text{ V}$, $R_L = 2\text{ }\Omega$, $I_D \approx 2\text{ A}$, $V_{GEN} = 4.5\text{ V}$, $R_g = 1\text{ }\Omega$	-	10	20	ns
Rise time	t_r		-	15	30	
Turn-off delay time	$t_{d(off)}$		-	40	80	
Fall time	t_f		-	10	20	
Drain-Source Body Diode Characteristics						
Continuous source-drain diode current	I_S	$T_A = 25\text{ }^\circ\text{C}$	-	-	1.5	A
Pulse diode forward current	I_{SM}		-	-	20	
Body diode voltage	V_{SD}	$I_S = 1.5\text{ A}$, $V_{GS} = 0\text{ V}$	-	0.7	1.2	V
Body diode reverse recovery time	t_{rr}	$I_F = 2\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $T_J = 25\text{ }^\circ\text{C}$	-	30	60	ns
Body diode reverse recovery charge	Q_{rr}		-	7	15	nC
Reverse recovery fall time	t_a		-	15	-	ns
Reverse recovery rise time	t_b		-	15	-	

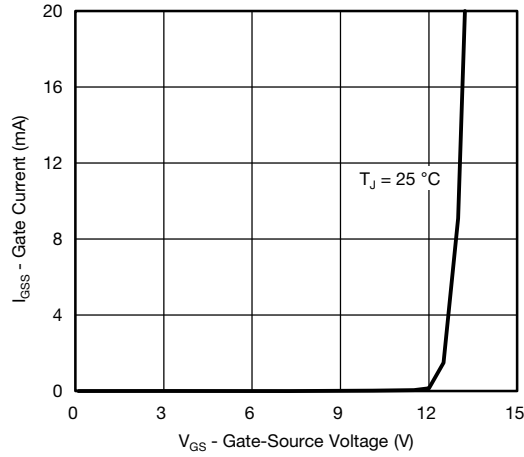
Notes

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing

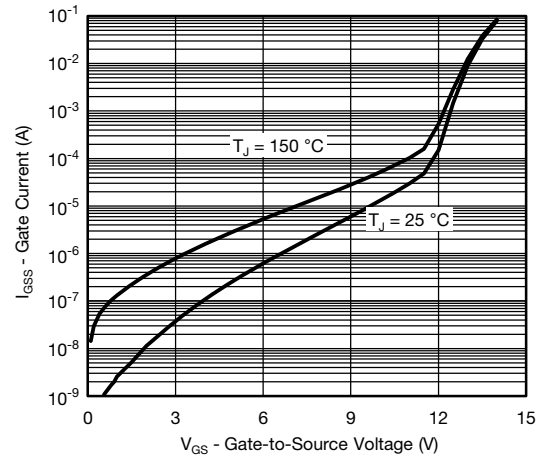
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



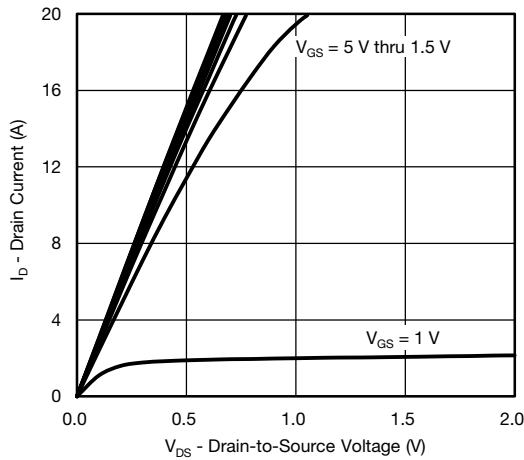
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



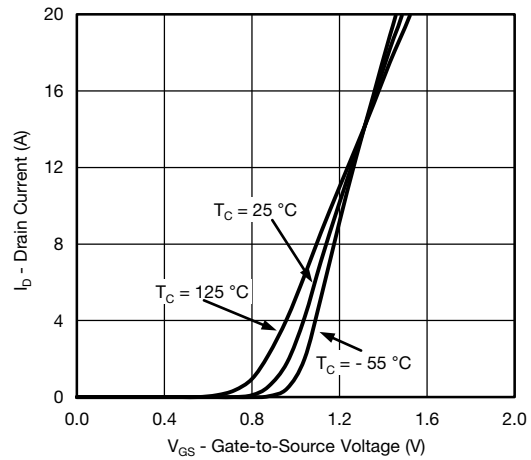
Output Characteristics



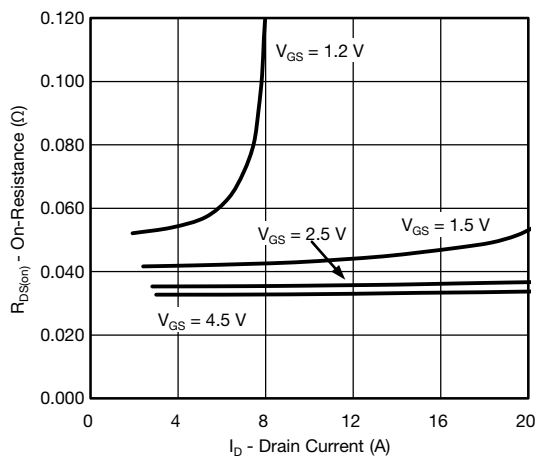
On-Resistance vs. Drain Current and Gate Voltage



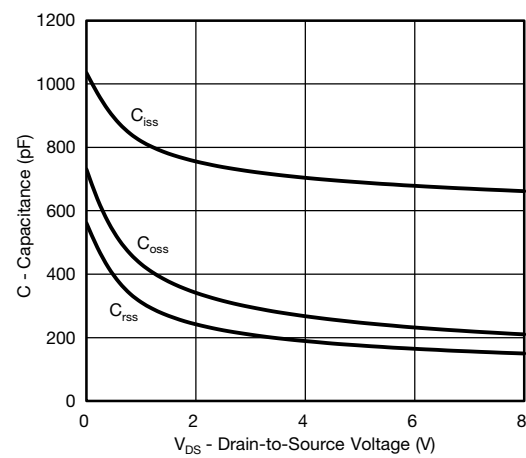
Output Characteristics



Transfer Characteristics



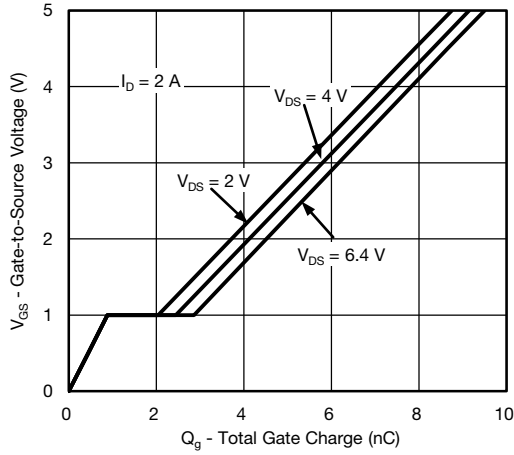
On-Resistance vs. Drain Current and Gate Voltage



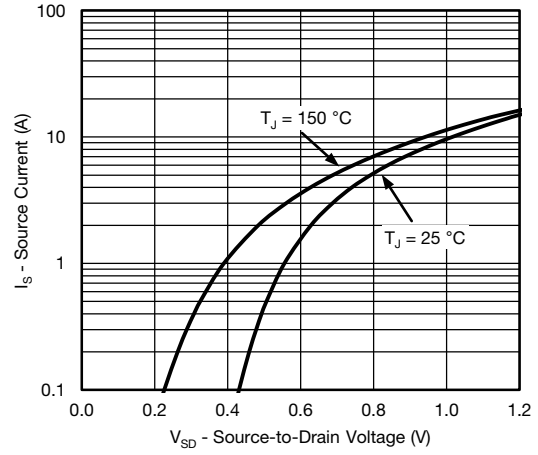
Capacitance



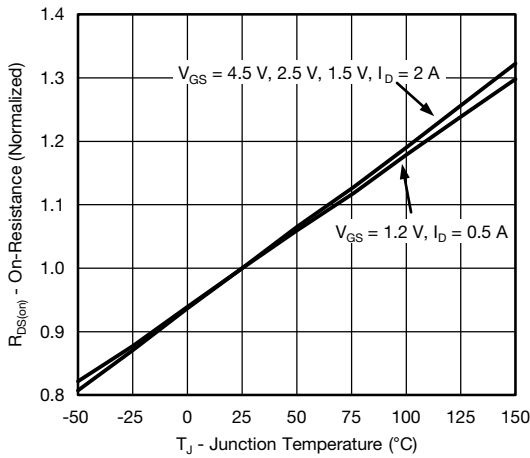
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



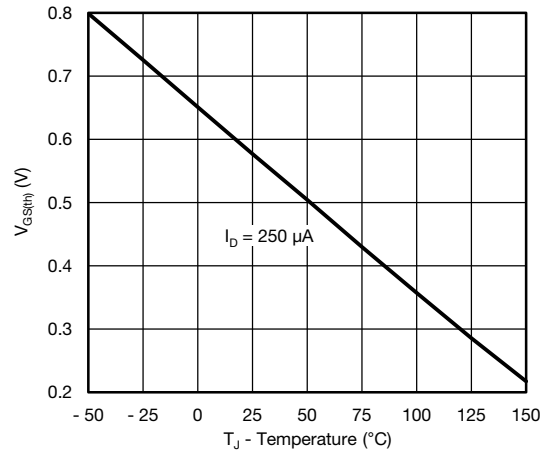
Gate Charge



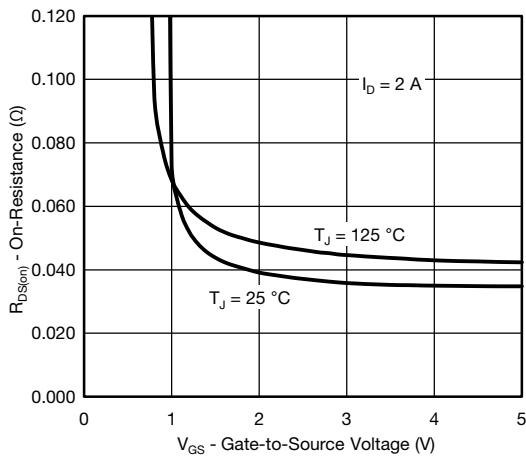
Source-Drain Diode Forward Voltage



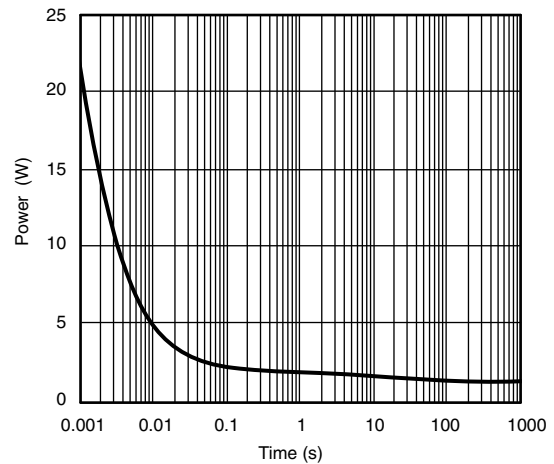
On-Resistance vs. Junction Temperature



Threshold Voltage

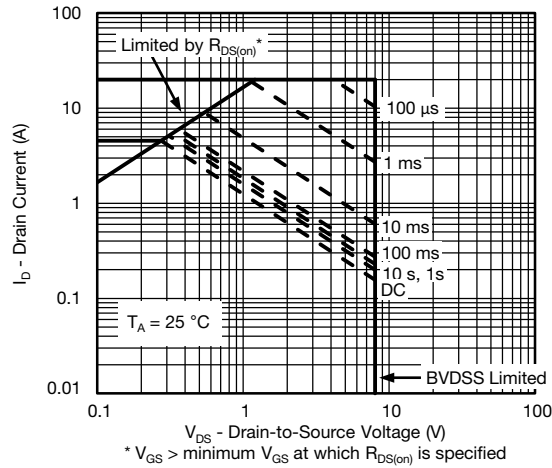


On-Resistance vs. Gate-to-Source Voltage

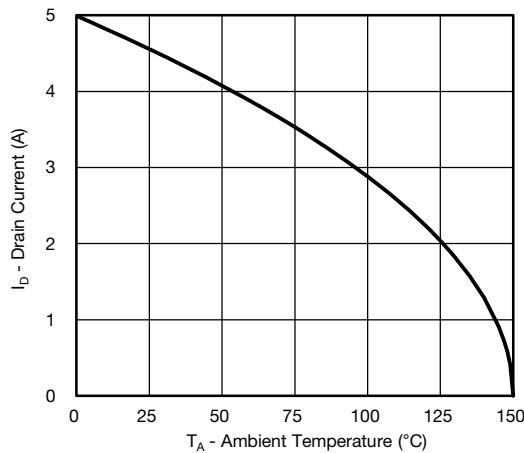


Single Pulse Power, Junction-to-Ambient

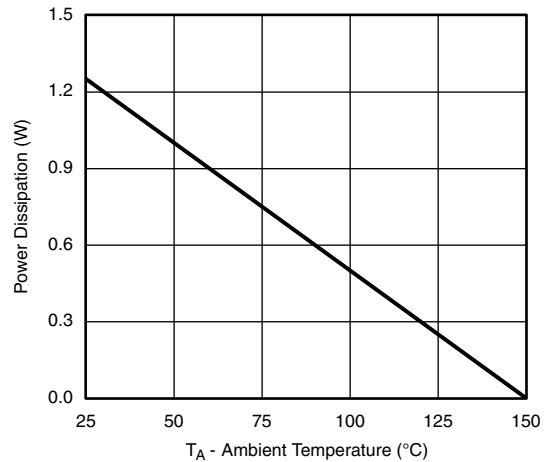
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Safe Operating Area, Junction-to-Ambient



Current Derating ^a



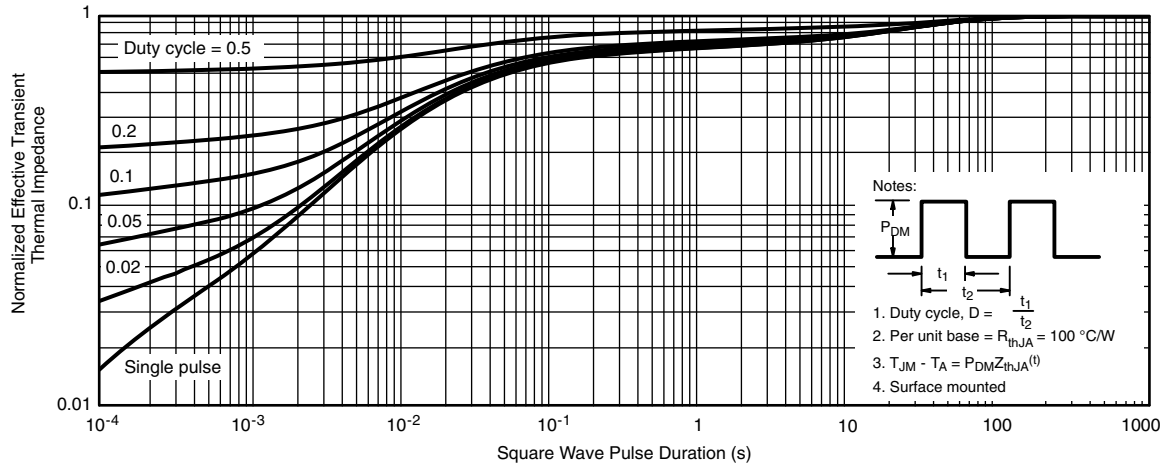
Power Derating

Notes

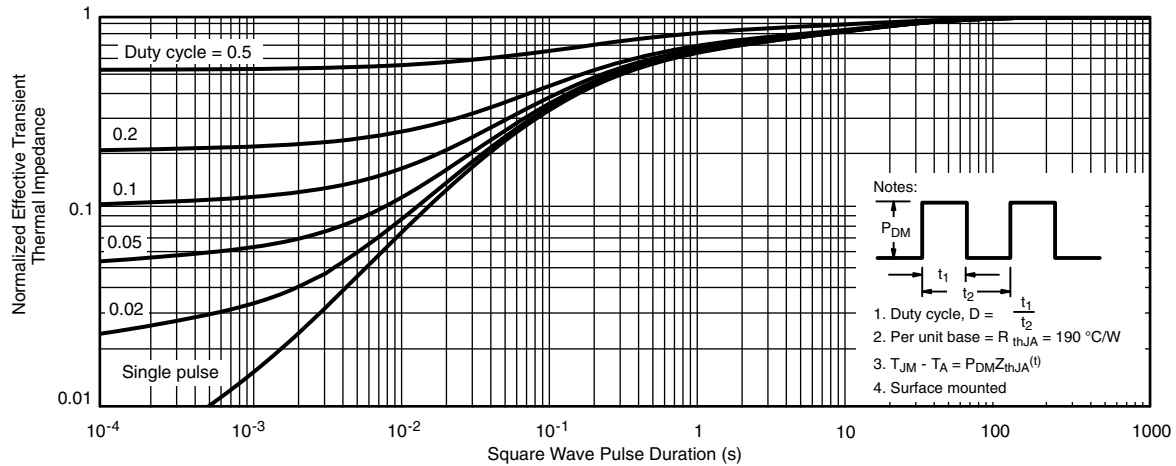
- When mounted on 1" x 1" FR4 with full copper
- a. The power dissipation P_D is based on $T_J \text{ max.} = 150 \text{ °C}$, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



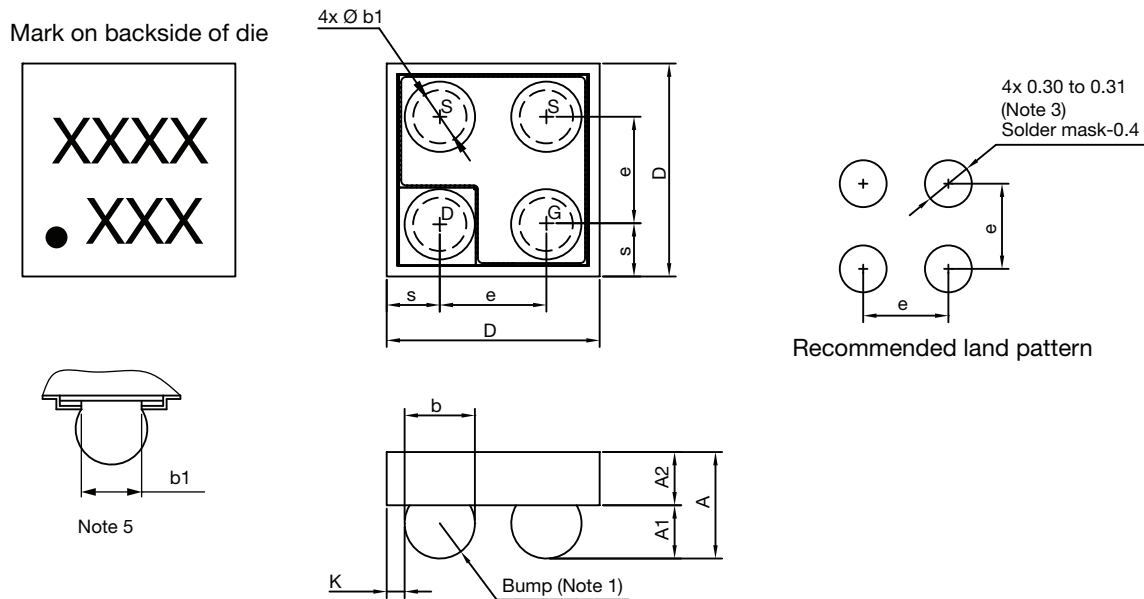
Normalized Thermal Transient Impedance, Junction-to-Ambient (1" x 1" FR4 Board with Full Copper)



Normalized Thermal Transient Impedance, Junction-to-Ambient (1" x 1" FR4 Board with Minimum Copper)

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MICRO FOOT[®]: 4-Bumps (1 mm x 1 mm, 0.5 mm Pitch, 0.286 mm Bump Height)


Notes

1. Bumps are 95.5/3.8/0.7 Sn/Ag/Cu.
2. Backside surface is coated with a Ti/Ni/Ag layer.
3. Non-solder mask defined copper landing pad.
4. Laser mark on the backside surface of die.
5. "b1" is the diameter of the solderable substrate surface, defined by an opening in the solder resist layer solder mask defined.
6. • is the location of pin 1

DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.458	0.504	0.550	0.0180	0.0198	0.0217
A1	0.214	0.250	0.286	0.0084	0.0098	0.0113
A2	0.244	0.254	0.264	0.0096	0.0100	0.0104
b	0.297	0.330	0.363	0.0117	0.0130	0.0143
b1	0.250			0.0098		
e	0.500			0.0197		
s	0.210	0.230	0.250	0.0083	0.0091	0.0096
D	0.920	0.960	1.000	0.0362	0.0378	0.0394
K	0.029	0.065	0.102	0.0011	0.0026	0.0040

Note

- Use millimeters as the primary measurement.

ECN: T15-0176-Rev. A, 27-Apr-15
DWG: 6039



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