

FDZ201N

N-Channel 2.5V Specified PowerTrench™ BGA MOSFET

General Description

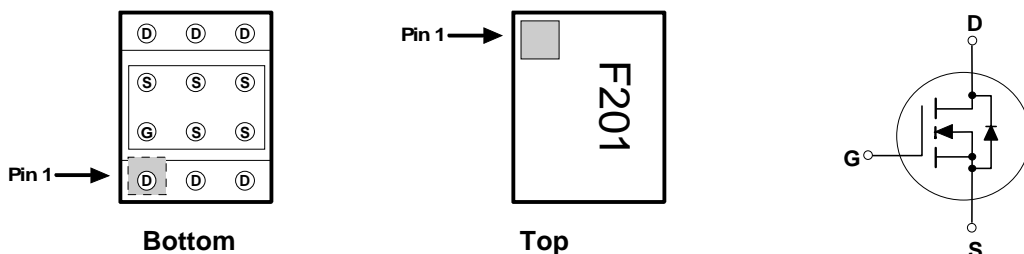
Combining Fairchild's advanced 2.5V specified PowerTrench process with state of the art BGA packaging, the FDZ201N minimizes both PCB space and $R_{DS(ON)}$. This BGA MOSFET embodies a breakthrough in packaging technology which enables the device to combine excellent thermal transfer characteristics, high current handling capability, ultra-low profile packaging, low gate charge, and low $R_{DS(ON)}$.

Applications

- Battery management
- Load switch
- Battery protection

Features

- 9 A, 20 V. $R_{DS(ON)} = 0.018 \Omega @ V_{GS} = 4.5 V$
 $R_{DS(ON)} = 0.030 \Omega @ V_{GS} = 2.5 V.$
- Occupies only 5 mm² of PCB area. Only 55% of the area of SSOT-6
- Ultra-thin package: less than 0.70 mm height when mounted to PCB
- Outstanding thermal transfer characteristics: 4 times better than SSOT-6
- Ultra-low $Q_g \times R_{DS(ON)}$ figure-of-merit.
- High power and current handling capability.



Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{DSS}	Drain-Source Voltage	20	V
V_{GSS}	Gate-Source Voltage	± 12	V
I_D	Drain Current – Continuous (Note 1a)	9	A
		20	
P_D	Power Dissipation (Steady State) (Note 1a)	2.7	W
T_J, T_{sig}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ\text{C}$

Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1a)	55	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 1)	12	$^\circ\text{C/W}$

Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape width	Quantity
F201	FDZ201N	TBD	TBD	TBD

Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV_{DSS}	Drain–Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	20			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = 250\ \mu\text{A}$, Referenced to 25°C		14		mV/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}$			1	μA
I_{GSSF}	Gate–Body Leakage Current, Forward	$V_{GS} = 12\text{ V}, V_{DS} = 0\text{ V}$			100	nA
I_{GSSR}	Gate–Body Leakage Current, Reverse	$V_{GS} = -12\text{ V}, V_{DS} = 0\text{ V}$			-100	nA

On Characteristics (Note 2)

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	0.4	0.9	1.5	V
$R_{DS(on)}$	Static Drain–Source On–Resistance	$V_{GS} = 4.5\text{ V}, I_D = 9\text{ A}$ $V_{GS} = 2.5\text{ V}, I_D = 6.5\text{ A}$			0.018 0.030	Ω

Drain–Source Diode Characteristics and Maximum Ratings

I_S	Maximum Continuous Drain–Source Diode Forward Current				2.3	A
V_{SD}	Drain–Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 2.3\text{ A}$ (Note 2)		0.77	1.2	V

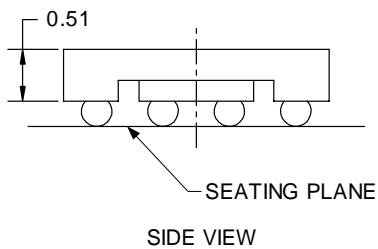
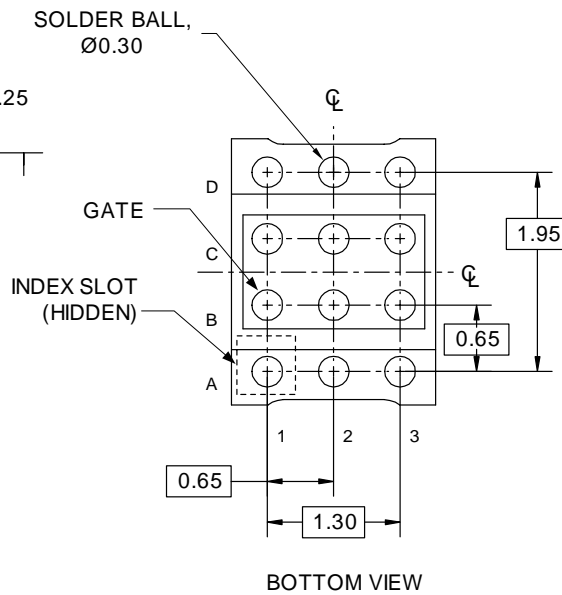
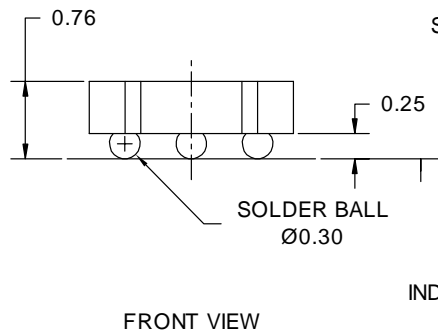
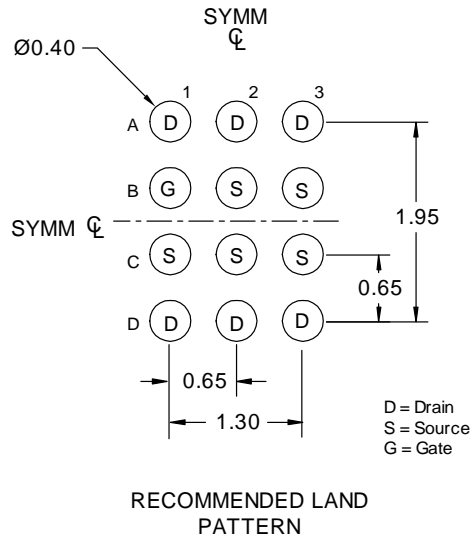
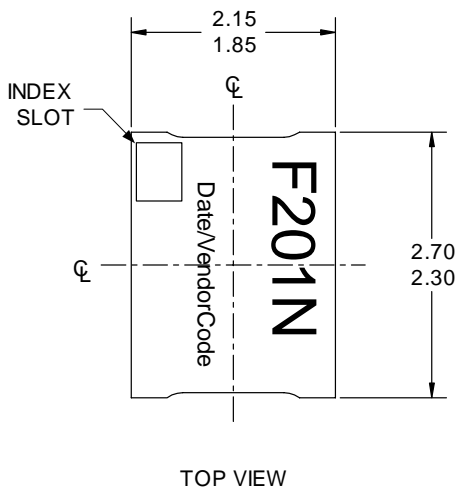
Notes:

- $R_{\theta JA}$ is a function of the junction-to-case ($R_{\theta JC}$), case-to-ambient ($R_{\theta CA}$) and the PC Board ($R_{\theta BA}$) thermal resistance where the case thermal reference is defined the top surface of the package. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ and $R_{\theta BA}$ are determined by the user's design.

(a). $R_{\theta JA} = 55^\circ\text{C/W}$ (steady-state) when mounted on 1 in² of 2 oz. copper.

- Pulse Test: Pulse Width < 300 μs , Duty Cycle < 2.0%

Dimensional Outline and Pad Layout



NOTES: UNLESS OTHERWISE SPECIFIED

- A) ALL DIMENSIONS ARE IN MILLIMETERS.
- B) NO JEDEC REGISTRATION REFERENCE AS OF JULY 1999.

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