

FDD18N20LZ

N-Channel MOSFET
200V Logic, 16A, 0.125Ω

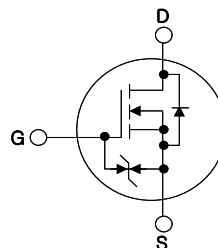
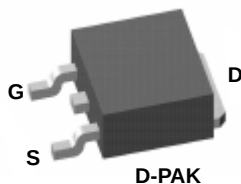
Features

- $R_{DS(on)} = 0.125\Omega$ (Max.) @ $V_{GS} = 10V$, $I_D = 8A$
- Low Gate Charge
- Low C_{rss}
- Fast Switching
- 100% Avalanche Tested
- Improved dv/dt Capability
- RoHS Compliant

Description

These N-Channel enhancement mode power field effect transistors are produced using Fairchild's proprietary, planar stripe, DMOS technology.

This advance technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficient switching mode power supplies and active power factor correction.



MOSFET Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted*

Symbol	Parameter	FDD18N20LZ	Units
V_{DSS}	Drain to Source Voltage	200	V
V_{GSS}	Gate to Source Voltage	± 20	V
I_D	Drain Current	-Continuous ($T_C = 25^\circ\text{C}$)	A
		-Continuous ($T_C = 100^\circ\text{C}$)	
I_{DM}	Drain Current	- Pulsed (Note 1)	A
E_{AS}	Single Pulsed Avalanche Energy	(Note 2)	mJ
I_{AR}	Avalanche Current	(Note 1)	A
E_{AR}	Repetitive Avalanche Energy	(Note 1)	mJ
dv/dt	Peak Diode Recovery dv/dt	(Note 3)	V/ns
P_D	Power Dissipation	($T_C = 25^\circ\text{C}$)	W
		- Derate above 25°C	$^\circ\text{C/W}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_L	Maximum Lead Temperature for Soldering Purpose, 1/8" from Case for 5 Seconds	300	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	FDD18N20LZ	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.4	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	83	

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDD18N20LZ	FDD18N20LZ	D-PAK	380mm	16mm	2500

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
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Off Characteristics

BV_{DSS}	Drain to Source Breakdown Voltage	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$, $T_J = 25^\circ\text{C}$	200	-	-	V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = 250\mu\text{A}$, Referenced to 25°C	-	0.2	-	$\text{V}/^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 200\text{V}$, $V_{GS} = 0\text{V}$	-	-	1	μA
		$V_{DS} = 160\text{V}$, $T_C = 125^\circ\text{C}$	-	-	10	
I_{GSS}	Gate to Body Leakage Current	$V_{GS} = \pm 16\text{V}$, $V_{DS} = 0\text{V}$	-	-	± 10	μA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 250\mu\text{A}$	1.0	-	2.5	V
$R_{DS(on)}$	Static Drain to Source On Resistance	$V_{GS} = 10\text{V}$, $I_D = 8\text{A}$	-	0.10	0.125	Ω
		$V_{GS} = 5\text{V}$, $I_D = 8\text{A}$	-	0.11	0.13	
g_{FS}	Forward Transconductance	$V_{DS} = 20\text{V}$, $I_D = 2\text{A}$ (Note 4)	-	11	-	S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{V}$, $V_{GS} = 0\text{V}$ $f = 1\text{MHz}$	-	1185	1575	pF
C_{oss}	Output Capacitance		-	190	255	pF
C_{rss}	Reverse Transfer Capacitance		-	25	40	pF
$Q_{g(tot)}$	Total Gate Charge at 10V	$V_{DS} = 200\text{V}$, $I_D = 16\text{A}$ $V_{GS} = 10\text{V}$ (Note 4, 5)	-	30	40	nC
Q_{gs}	Gate to Source Gate Charge		-	3.5	-	nC
Q_{gd}	Gate to Drain "Miller" Charge		-	8.5	-	nC

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 100\text{V}$, $I_D = 16\text{A}$ $V_{GS} = 10\text{V}$, $R_G = 25\Omega$ (Note 4, 5)	-	15	40	ns
t_r	Turn-On Rise Time		-	20	50	ns
$t_{d(off)}$	Turn-Off Delay Time		-	135	280	ns
t_f	Turn-Off Fall Time		-	50	110	ns

Drain-Source Diode Characteristics

I _S	Maximum Continuous Drain to Source Diode Forward Current	-	-	16	A	
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current	-	-	64	A	
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _{SD} = 4A	-	-	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0V, I _{SD} = 4A dI _F /dt = 100A/μs (Note 4)	-	105	-	ns
Q _{rr}	Reverse Recovery Charge		-	0.4	-	μC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L = 2.5\text{mH}$, $I_{AS} = 16\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. $I_{SD} \leq 16\text{A}$, $dI/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$
4. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$
5. Essentially Independent of Operating Temperature Typical Characteristics

Typical Performance Characteristics

Figure 1. On-Region Characteristics

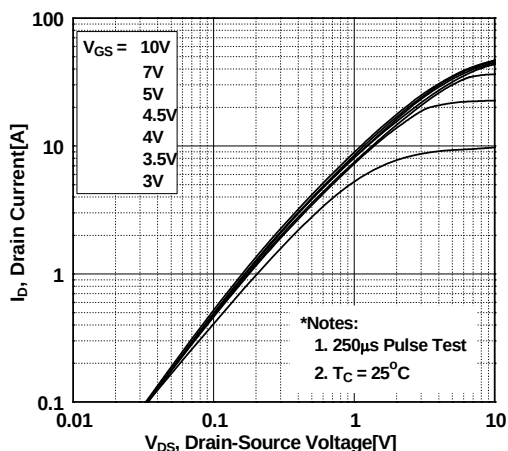


Figure 2. Transfer Characteristics

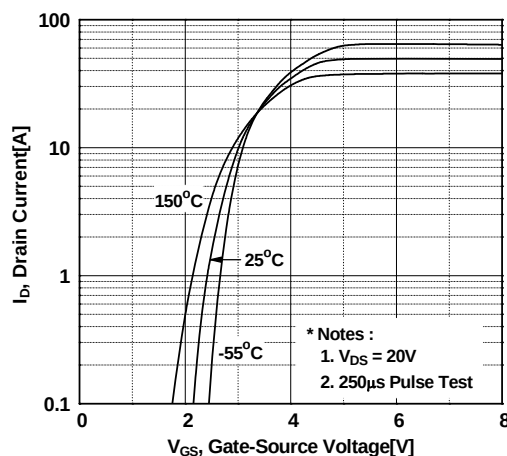


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

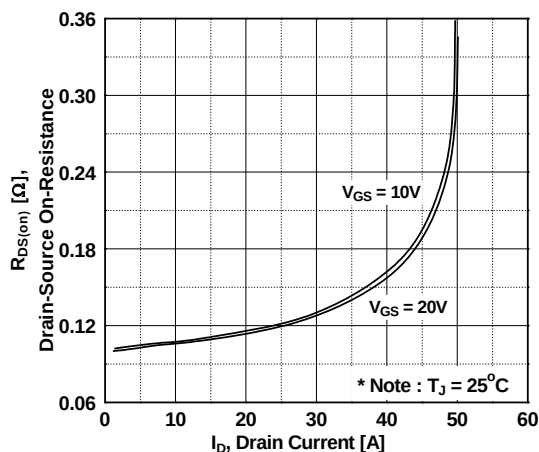


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

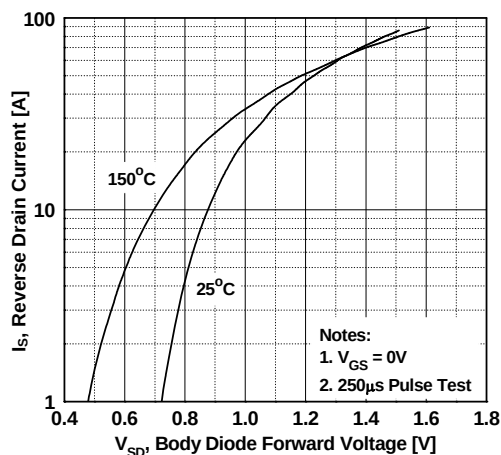


Figure 5. Capacitance Characteristics

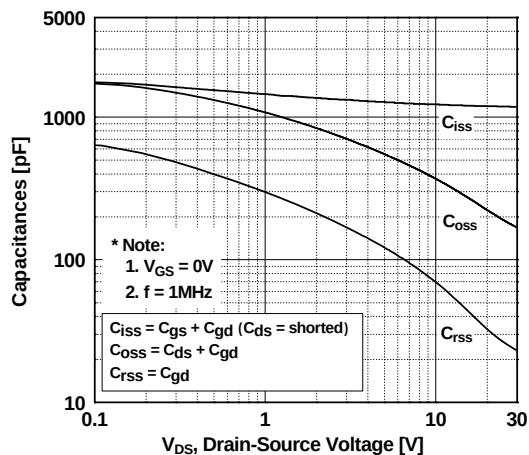
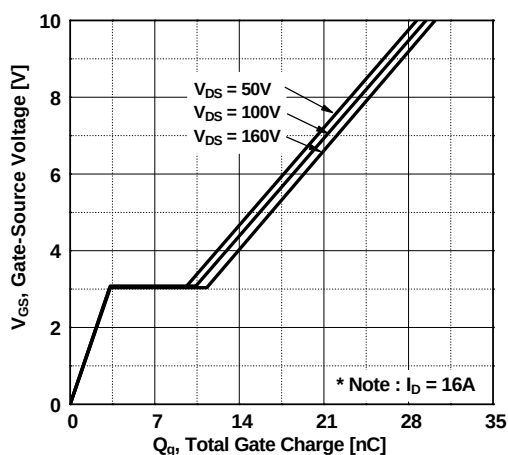


Figure 6. Gate Charge Characteristics



Typical Performance Characteristics (Continued)

Figure 7. Breakdown Voltage Variation vs. Temperature

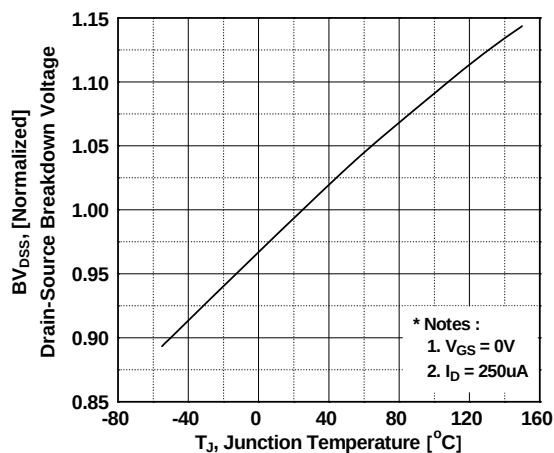


Figure 8. On-Resistance Variation vs. Temperature

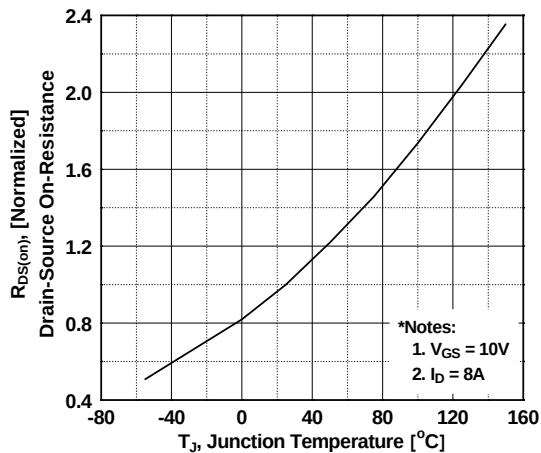


Figure 9. Maximum Safe Operating Area

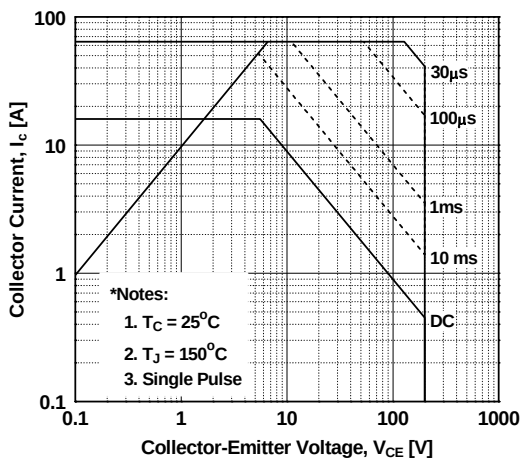


Figure 10. Maximum Drain Current vs. Case Temperature

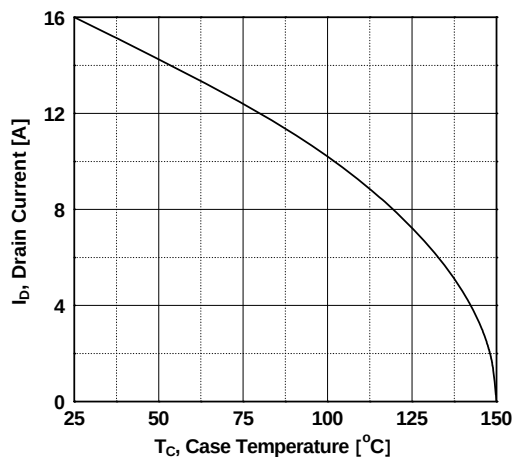
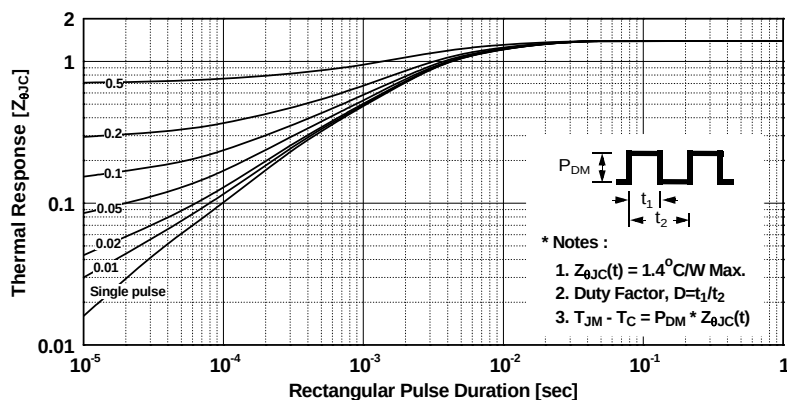
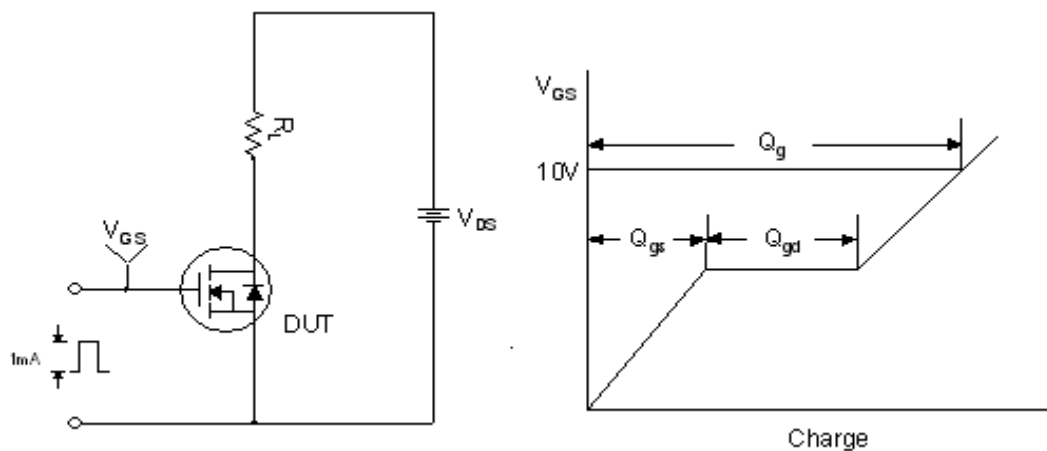


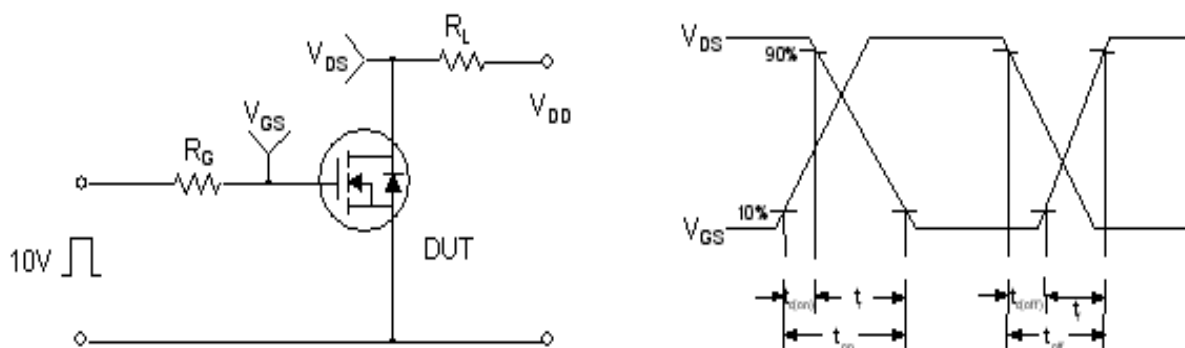
Figure 11. Transient Thermal Response Curve



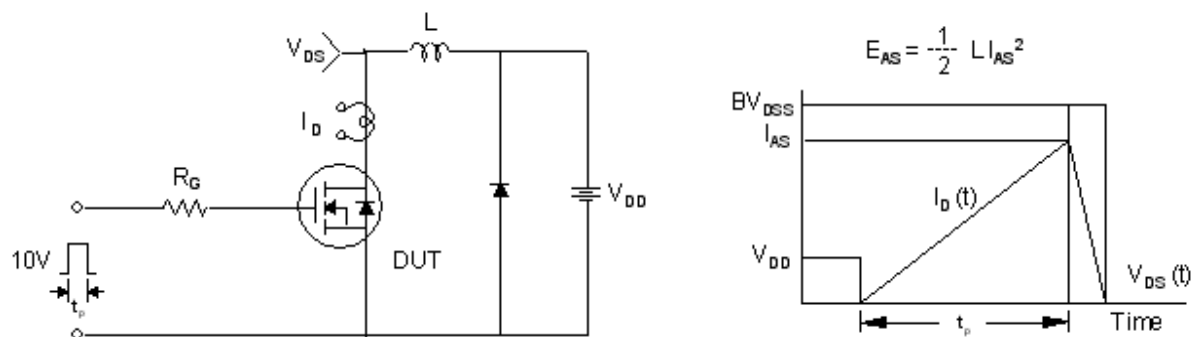
Gate Charge Test Circuit & Waveform



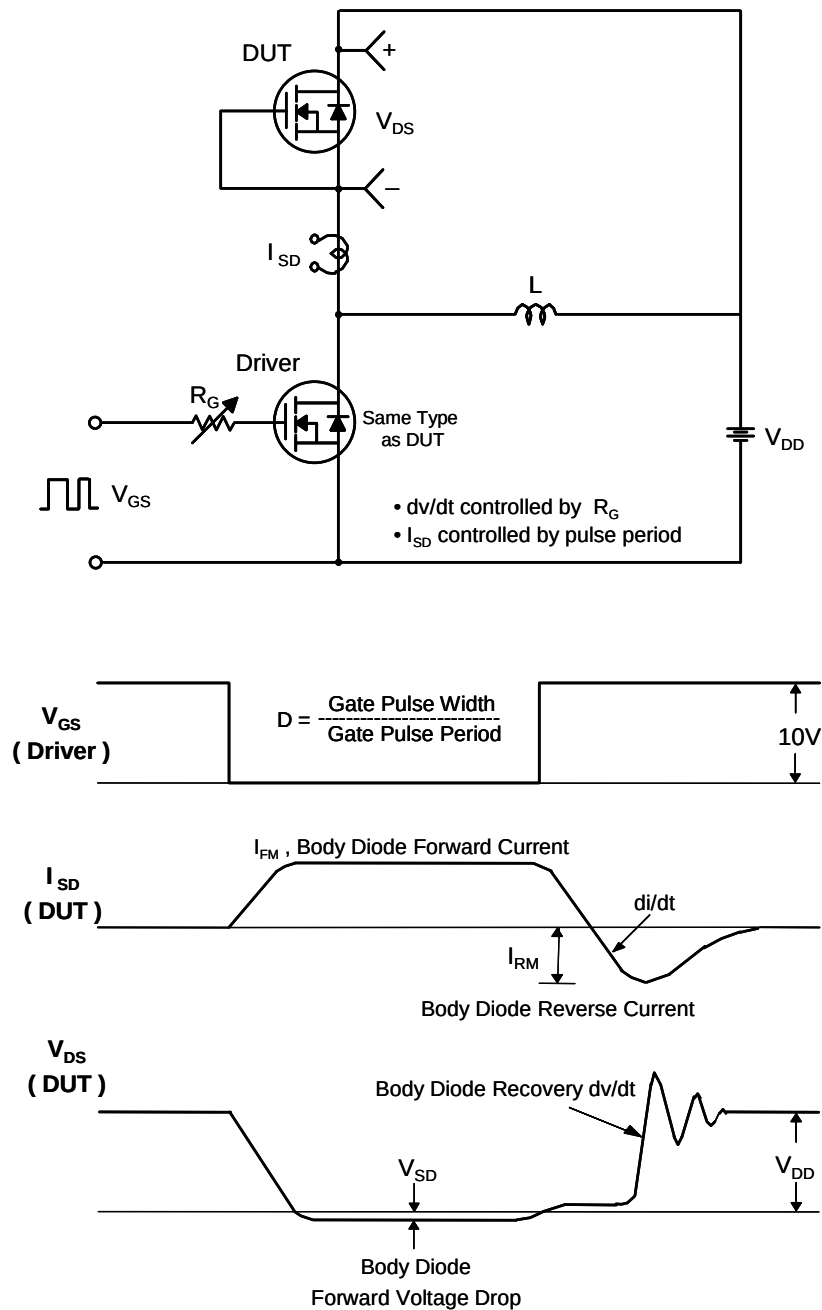
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Peak Diode Recovery dv/dt Test Circuit & Waveforms



Technical drawing of a mechanical part with dimensions and tolerances. The drawing shows a cross-section of a component with a central rectangular body and a smaller rectangular feature on top. Dimensions are given in millimeters (mm) with tolerances in parentheses. The drawing includes a title block with the following information:

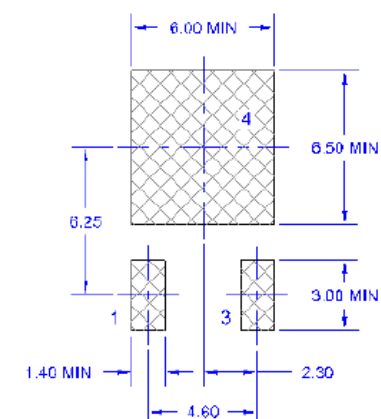
- Part Name: 1.02 MAX
- Material: 1.02 MAX
- Scale: 1:1
- Drawing Date: 1.02 MAX
- Drawing Number: 1.02 MAX
- Revision: 1.02 MAX

Dimensions and Tolerances:

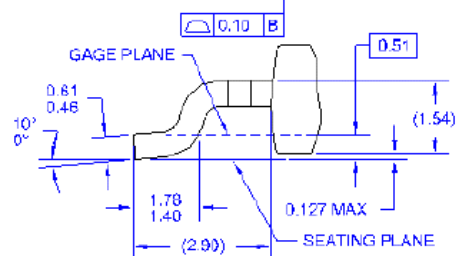
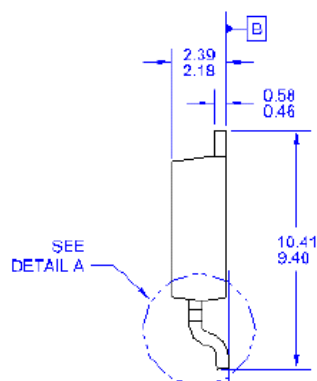
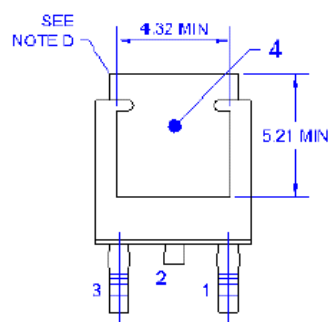
- Top Width: 6.73 (0.09)
- Top Width: 6.35 (0.09)
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- Top Width: 1.27 (0.09)
- Top Width: 1.02 MAX
- Top Width: 1.14 (0.08)
- Top Width: 2.29 (0.08)
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- Top Width: 0.09 (0.04)
- Top Width: 0.69 (0.09)
- Top Width: 6.22 (5.97)

Surface Finish Requirements:

- Surface 1: 0.25 (0.025)
- Surface 2: 0.05 (0.005)
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- Surface 99: 0.05 (0.005)
- Surface 100: 0.05 (0.005)



LAND PATTERN RECOMMENDATION



NOTES: UNLESS OTHERWISE SPECIFIED

- A) THIS PACKAGE CONFORMS TO JEDEC, TO-252
- ISSUE C, VARIATION AA.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONING AND TOLERANCING PER
ASME Y14.3M-1994.
- D) HEAT SINK TOP EDGE COULD BE IN CHAMFERED
CORNERS OR EDGE PROTRUSION.
- E) PRESENCE OF TRIMMED CENTER LEAD
IS OPTIONAL.
- F) DIMENSIONS ARE EXCLUSIVE OF BURRS,
MOLD FLASH AND TIE BAR PROTRUSIONS.
- G) LAND PATTERN RECOMMENDATION IS BASED ON IPC7351A STD
TO220P100KX236-0N.
- H) DRAWING NUMBER AND REVISION: WKT-TO252A03HEVB

Dimensions in Millimeters



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MicroPak2™
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2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

Rev. I51



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- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
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- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.