

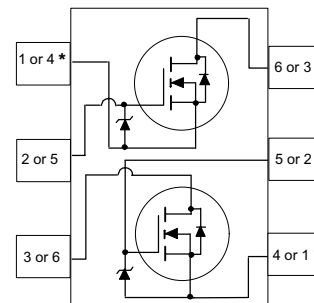
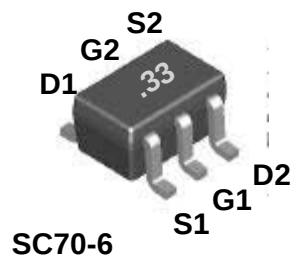
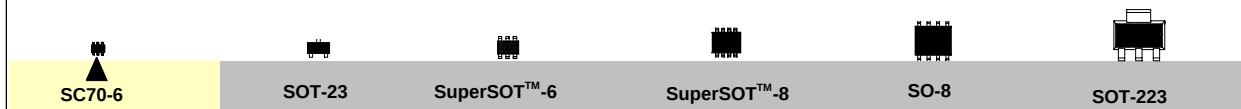
FDG6313N Dual N-Channel, Digital FET

General Description

These dual N-Channel logic level enhancement mode field effect transistors are produced using Fairchild's proprietary, high cell density, DMOS technology. This very high density process is especially tailored to minimize on-state resistance. This device has been designed especially for low voltage applications as a replacement for bipolar digital transistors and small signal MOSFETs.

Features

- 25 V, 0.50 A continuous, 1.5 A peak.
 $R_{DS(ON)} = 0.45 \Omega @ V_{GS} = 4.5 \text{ V}$,
 $R_{DS(ON)} = 0.60 \Omega @ V_{GS} = 2.7 \text{ V}$.
- Very low level gate drive requirements allowing direct operation in 3 V circuits ($V_{GS(th)} < 1.5 \text{ V}$).
- Gate-Source Zener for ESD ruggedness (>6kV Human Body Model).
- Compact industry standard SC70-6 surface mount package.



* The pinouts are symmetrical; pin 1 and 4 are interchangeable.
Units inside the carrier can be of either orientation and will not affect the functionality of the device.

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

Symbol	Parameter	FDG6313N	Units
V_{DSS}	Drain-Source Voltage	25	V
V_{GSS}	Gate-Source Voltage	- 0.5 to +8	V
I_D	Drain/Output Current - Continuous - Pulsed	0.5	A
		1.5	
P_D	Maximum Power Dissipation (Note 1)	0.3	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
ESD	Electrostatic Discharge Rating MIL-STD-883D Human Body Model (100 pF / 1500 Ω)	6.0	kV

THERMAL CHARACTERISTICS

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	415	$^\circ\text{C/W}$
-----------------	---	-----	--------------------

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	25			V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	$I_D = 250\text{ }\mu\text{A}$, Referenced to 25°C		26		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}$ $T_J = 55^{\circ}\text{C}$			1 10	μA μA
I_{GSS}	Gate - Body Leakage Current	$V_{GS} = 8\text{ V}, V_{DS} = 0\text{ V}$			100	nA
ON CHARACTERISTICS (Note 2)						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.65	0.8	1.5	V
$\Delta V_{GS(th)}/\Delta T_J$	Gate Threshold Voltage Temp.Coefficient	$I_D = 250\text{ }\mu\text{A}$, Referenced to 25°C		-2.6		mV/°C
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 4.5\text{ V}, I_D = 0.5\text{ A}$ $T_J = 125^{\circ}\text{C}$ $V_{GS} = 2.7\text{ V}, I_D = 0.2\text{ A}$		0.34 0.55 0.44	0.45 0.77 0.6	Ω
$I_{D(ON)}$	On-State Drain Current	$V_{GS} = 2.7\text{ V}, V_{DS} = 5\text{ V}$	0.5			A
g_{FS}	Forward Transconductance	$V_{DS} = 5\text{ V}, I_D = 0.5\text{ A}$		1.45		S
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$		50		pF
C_{oss}	Output Capacitance			28		pF
C_{rss}	Reverse Transfer Capacitance			9		pF
SWITCHING CHARACTERISTICS (Note 2)						
$t_{D(on)}$	Turn - On Delay Time	$V_{DD} = 5\text{ V}, I_D = 0.5\text{ A},$ $V_{GS} = 4.5\text{ V}, R_{GEN} = 50\text{ }\Omega$		3	6	ns
t_r	Turn - On Rise Time			8.5	18	ns
$t_{D(off)}$	Turn - Off Delay Time			17	30	ns
t_f	Turn - Off Fall Time			13	25	ns
Q_{gi}	Total Gate Charge	$V_{DS} = 5\text{ V}, I_D = 0.5\text{ A},$ $V_{GS} = 4.5\text{ V}$		1.64	2.3	nC
Q_{gs}	Gate-Source Charge			0.38		nC
Q_{gd}	Gate-Drain Charge			0.45		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I_S	Maximum Continuous Source Current				0.25	A
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 0.25\text{ A}$ (Note 2)		0.8	1.2	V

Notes:

- $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA} = 415^{\circ}\text{C/W}$ on minimum pad mounting on FR-4 board in still air.
- Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

Typical Electrical Characteristics

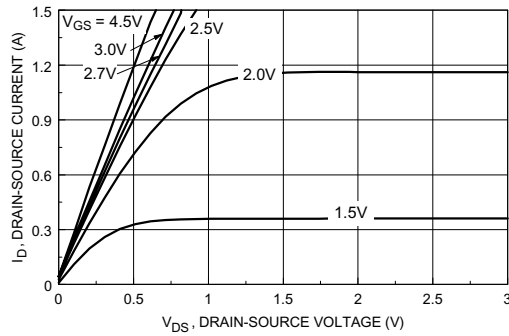


Figure 1. On-Region Characteristics.

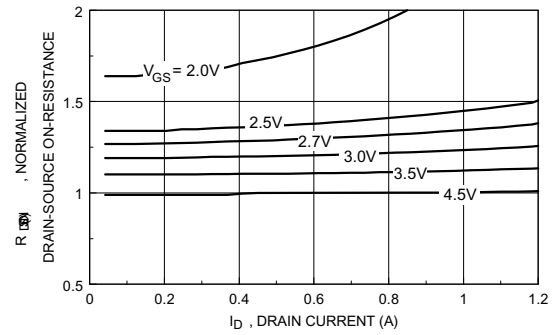


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

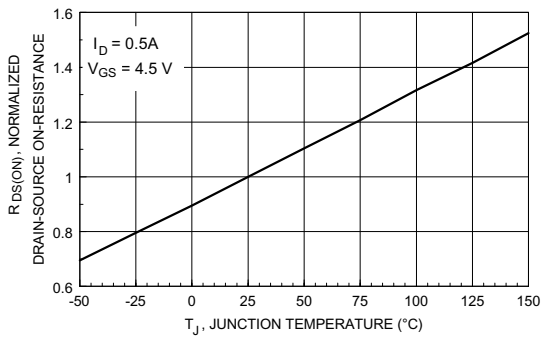


Figure 3. On-Resistance Variation with Temperature.

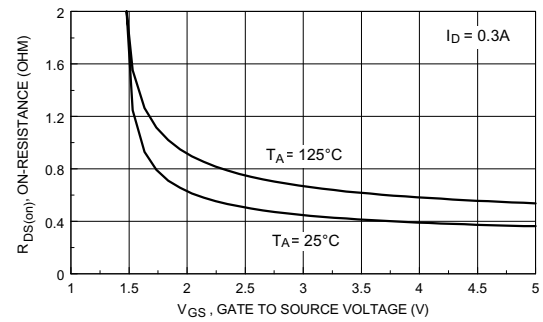


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

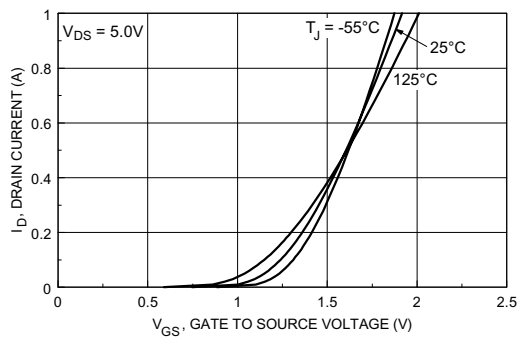


Figure 5. Transfer Characteristics.

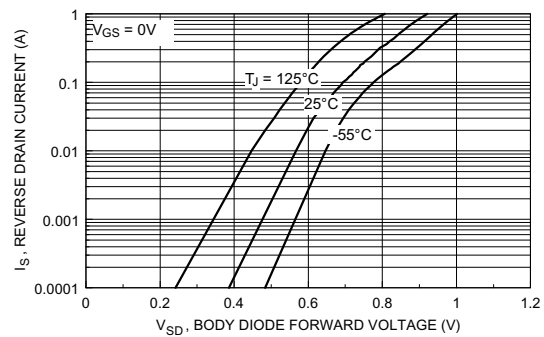


Figure 6 . Body Diode Forward Voltage Variation with Source Current and Temperature.

Typical Electrical Characteristics (continued)

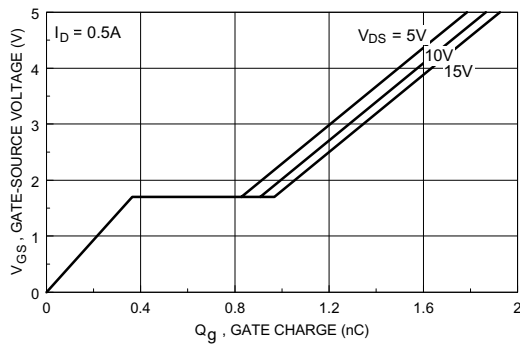


Figure 7. Gate Charge Characteristics.

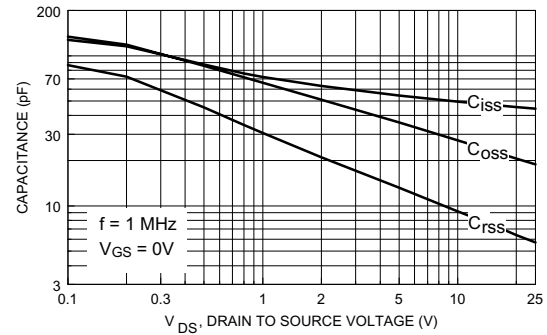


Figure 8. Capacitance Characteristics.

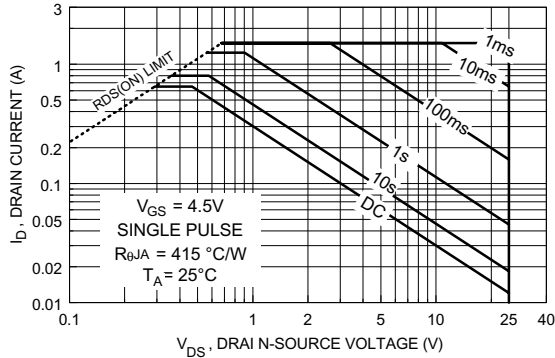


Figure 9. Maximum Safe Operating Area.

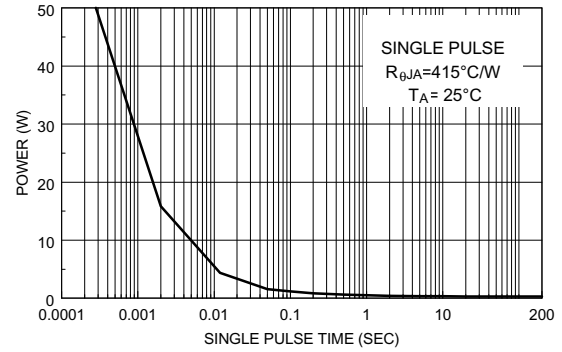


Figure 10. Single Pulse Maximum Power Dissipation.

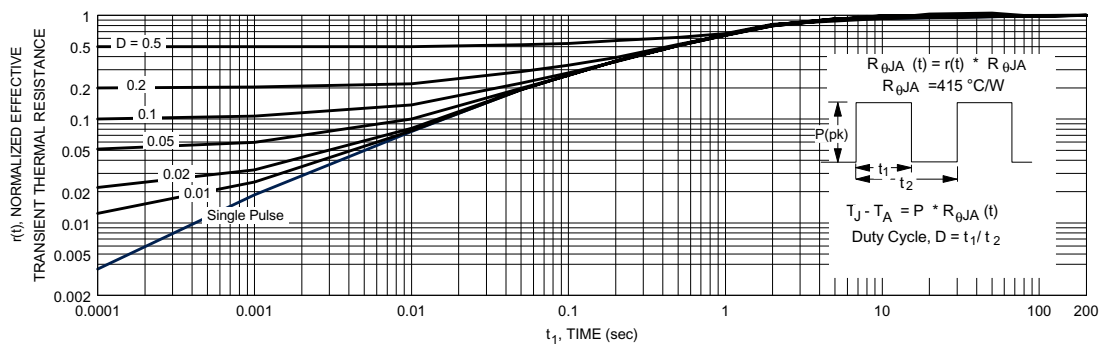


Figure 11. Transient Thermal Response Curve.

Thermal characterization performed using the conditions described in note 1.
Transient thermal response will change depending on the circuit board design.

TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACE ^x [™]	FAST [®]	ISOPLANAR [™]	Power247 [™]	SuperFET [™]
ActiveArray [™]	FAST _r [™]	LittleFET [™]	PowerSaver [™]	SuperSOT [™] -3
Bottomless [™]	FPS [™]	MICROCOUPLER [™]	PowerTrench [®]	SuperSOT [™] -6
CoolFET [™]	FRFET [™]	MicroFET [™]	QFET [®]	SuperSOT [™] -8
CROSSVOLT [™]	GlobalOptoisolator [™]	MicroPak [™]	QS [™]	SyncFET [™]
DOME [™]	GTO [™]	MICROWIRE [™]	QT Optoelectronics [™]	TinyLogic [®]
EcoSPARK [™]	HiSeC [™]	MSX [™]	Quiet Series [™]	TINYOPTO [™]
E ² C MOS [™]	I ² C [™]	MSXPro [™]	RapidConfigure [™]	TruTranslation [™]
EnSigna [™]	i-Lo [™]	OCX [™]	RapidConnect [™]	UHC [™]
FACT [™]	ImpliedDisconnect [™]	OCXPro [™]	μSerDes [™]	UltraFET [®]
FACT Quiet Series [™]		OPTOLOGIC [®]	SILENT SWITCHER [®]	VCX [™]
Across the board. Around the world. [™]		OPTOPLANAR [™]	SMART START [™]	
The Power Franchise [®]		PACMAN [™]	SPM [™]	
Programmable Active Droop [™]		POP [™]	Stealth [™]	

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is 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.

PRODUCT STATUS DEFINITIONS

Definition of Terms

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



**Стандарт
Электрон
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331