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Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild guestions@onsemi.com.

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FDMC8010

N-Channel PowerTrench[®] MOSFET 30 V, 75 A, 1.3 m Ω

Features

- Max $r_{DS(on)} = 1.3 \text{ m}\Omega$ at $V_{GS} = 10 \text{ V}$, $I_D = 30 \text{ A}$
- Max $r_{DS(on)}$ = 1.8 m Ω at V_{GS} = 4.5 V, I_D = 25 A
- High performance technology for extremely low r_{DS(on)}
- Termination is Lead-free and RoHS Compliant

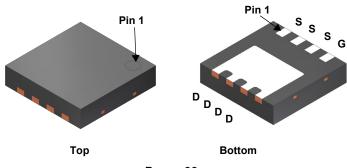
General Description

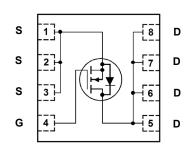
This N-Channel MOSFET is produced using ON Semiconductor's advanced PowerTrench® process that has been especially tailored to minimize the on-state resistance. This device is well suited for applications where ultra low $r_{DS(\text{on})}$ is required in small spaces such as High performance VRM, POL and Oring functions.

Applications

- DC DC Buck Converters
- Point of Load
- High Efficiency Load Switch and Low Side Switching
- Oring FET







Power 33

MOSFET Maximum Ratings T_A = 25 °C unless otherwise noted

Symbol	Parameter			Ratings	Units
V_{DS}	Drain to Source Voltage			30	V
V_{GS}	Gate to Source Volage		(Note 4)	±20	V
	Drain Current -Continuous (Package limited)	T _C = 25 °C		75	
	-Continuous (Silicon limited)	T _C = 25 °C		166	Α
ID	-Continuous	T _A = 25 °C	(Note 1a)	30	7 ^
	-Pulsed			120	
E _{AS}	Single Pulse Avalance Energy		(Note 3)	153	mJ
P _D	Power Dissipation	T _C = 25 °C		54	W
	Power Dissipation	T _A = 25 °C	(Note 1a)	2.4	
T _J , T _{STG}	Operating and Storage Junction Temperature Ra	ange		-55 to +150	°C

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance, Junction to Case		2.3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	(Note 1a)	53	C/VV

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDMC8010	FDMC8010	Power 33	13 "	12 mm	3000 units

Electrical Characteristics $T_J = 25$ °C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
Off Chara	cteristics					
BV_{DSS}	Drain to Source Breakdown Voltage	I _D = 1 mA, V _{GS} = 0 V	30			V
$\frac{\Delta BV_{DSS}}{\Delta T_{J}}$	Breakdown Voltage Temperature Coefficient	I _D = 1 mA, referenced to 25 °C		15		mV/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 24 V, V _{GS} = 0 V			1	μΑ
I _{GSS}	Gate to Source Leakage Current	$V_{GS} = 20 \text{ V}, V_{DS} = 0 \text{ V}$			100	nA

On Characteristics

V _{GS(th)}	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 1 \text{ mA}$	1.2	1.5	2.5	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	I _D = 1 mA, referenced to 25 °C		-5		mV/°C
r _{DS(on)}	Static Drain to Source On Resistance	V _{GS} = 10 V, I _D = 30 A		0.9	1.3	
		V _{GS} = 4.5 V, I _D = 25 A		1.3	1.8	mΩ
		V _{GS} = 10 V, I _D = 30A, T _J = 125 °C		1.3	2	
g _{FS}	Forward Transconductance	V _{DS} = 5 V, I _D = 30 A		188		S

Dynamic Characteristics

C _{iss}	Input Capacitance	V - 45 V V - 0 V		4405	5860	pF
C _{oss}	Output Capacitance	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz		1570	2090	pF
C _{rss}	Reverse Transfer Capacitance	1 - 1 1011 12		167	250	pF
R_q	Gate Resistance		0.1	0.5	1.25	Ω

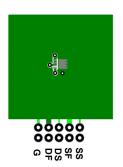
Switching Characteristics

t _{d(on)}	Turn-On Delay Time		15	27	ns
t _r	Rise Time	V _{DD} = 15 V, I _D = 30 A,	7.5	15	ns
t _{d(off)}	Turn-Off Delay Time	V_{GS} = 10 V, R_{GEN} = 6 Ω	40	64	ns
t _f	Fall Time		5.3	11	ns
Q_{g}	Total Gate Charge	V _{GS} = 0 V to 10 V	67	94	nC
Q_{g}	Total Gate Charge	$V_{GS} = 0 \text{ V to } 4.5 \text{ V}$ $V_{DD} = 15 \text{ V}$	32	45	nC
Q _{gs}	Gate to Source Charge	I _D = 30 A	10		nC
Q_{gd}	Gate to Drain "Miller" Charge		9.5		nC

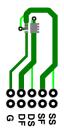
Drain-Source Diode Characteristics

Vod Source to Drain Dioge Forward Voltage	Source to Drain Diado Forward Voltage	V _{GS} = 0 V, I _S = 2 A (Note 2)	0.6	1.2	\/
	$V_{GS} = 0 \text{ V, } I_S = 30 \text{ A} $ (Note 2)	0.7	1.2	v	
t _{rr}	Reverse Recovery Time	I _F = 30 A, di/dt = 100 A/μs	49	78	ns
Q _{rr}	Reverse Recovery Charge	IF - 30 A, di/dt - 100 A/μs	29	46	nC

¹ R_{0JA} is determined with the device mounted on a 1 in² pad 2 oz copper pad on a 1.5 x 1.5 in. board of FR-4 material. R_{0JC} is guaranteed by design while R_{0CA} is determined by the user's board design.



a. 53 °C/W when mounted on a 1 in² pad of 2 oz copper.



b. 125 °C/W when mounted on a minimum pad of 2 oz copper.

^{2.} Pulse Test: Pulse Width < 300 $\mu s,$ Duty cycle < 2.0 %.

^{3.} E_{AS} of 153 mJ is based on starting T_J = 25 °C, L = 0.3 mH, I_{AS} = 32 A, V_{DD} = 27 V, V_{GS} = 10 V. 100% test at L = 0.1 mH, I_{AS} = 47 A.

^{4.} As an N-ch device, the negative Vgs rating is for low duty cycle pulse occurrence only. No continuous rating is implied.

Typical Characteristics T_J = 25°C unless otherwise noted

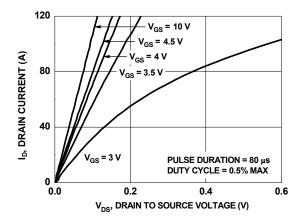


Figure 1. On Region Characteristics

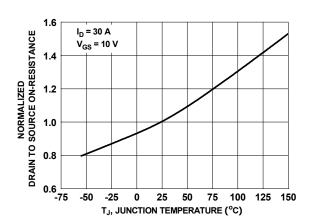


Figure 3. Normalized On Resistance vs Junction Temperature

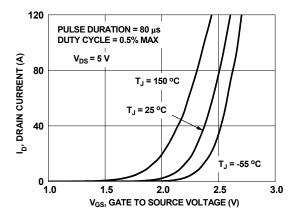


Figure 5. Transfer Characteristics

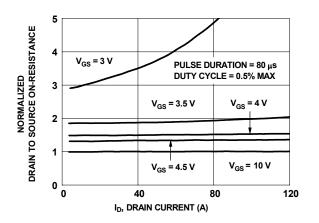


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

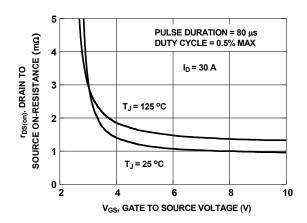


Figure 4. On-Resistance vs Gate to Source Voltage

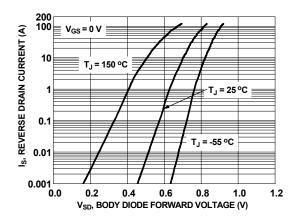


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

Typical Characteristics T_J = 25°C unless otherwise noted

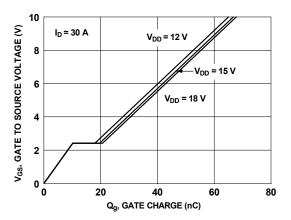


Figure 7. Gate Charge Characteristics

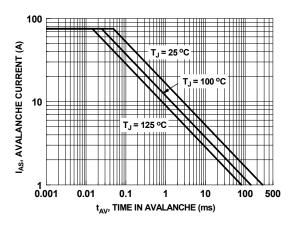


Figure 9. Unclamped Inductive Switching Capability

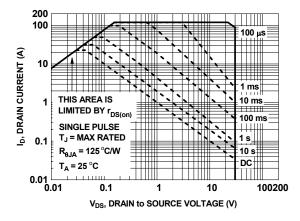


Figure 11. Forward Bias Safe Operating Area

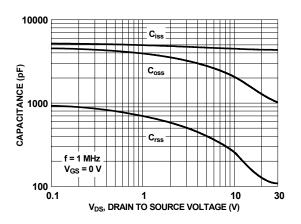


Figure 8. Capacitance vs Drain to Source Voltage

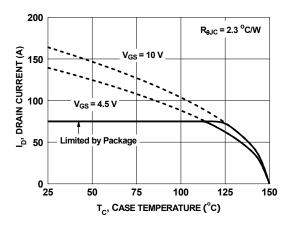


Figure 10. Maximum Continuous Drain Current vs Case Temperature

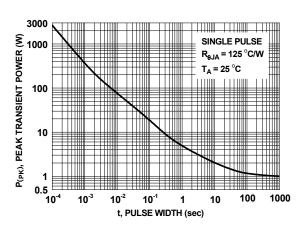


Figure 12. Single Pulse Maximum Power Dissipation

Typical Characteristics T_J = 25°C unless otherwise noted

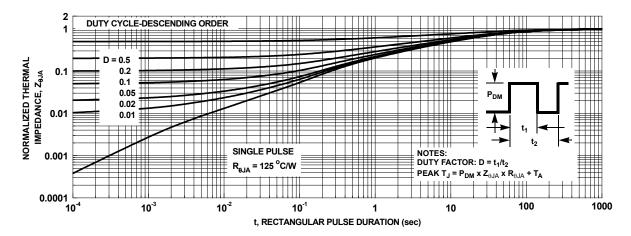
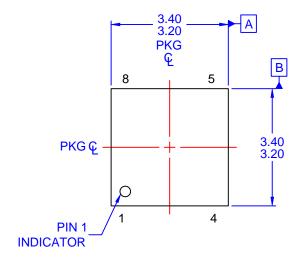
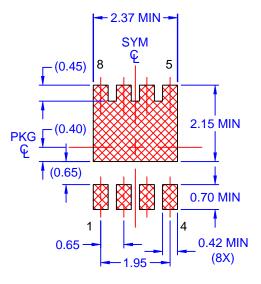
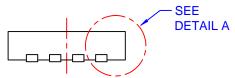


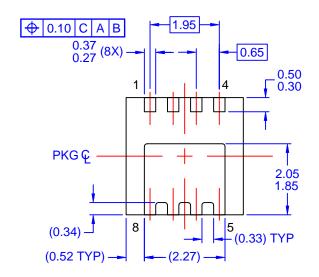
Figure 13. Junction-to-Ambient Transient Thermal Response Curve





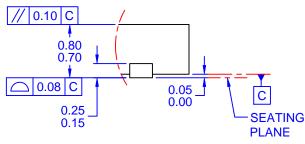


LAND PATTERN RECOMMENDATION



NOTES: UNLESS OTHERWISE SPECIFIED

- A) PACKAGE STANDARD REFERENCE: JEDEC MO-240, ISSUE A, VAR. BA, DATED OCTOBER 2002.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH. MOLD FLASH OR BURRS DOES NOT EXCEED 0.10MM.
- D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
- E) DRAWING FILE NAME: PQFN08HREV1



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http://moschip.ru/get-element

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Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

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