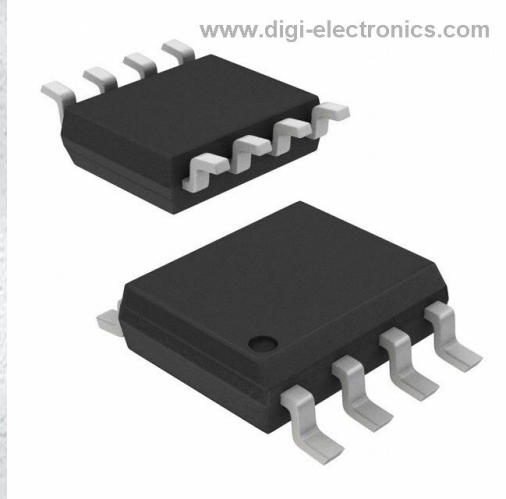
FDS4897AC Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	FDS4897AC-DG
Manufacturer	onsemi
Manufacturer Product Number	FDS4897AC
Description	MOSFET N/P-CH 40V 6.1A 8SOIC
Detailed Description	Mosfet Array 40V 6.1A, 5.2A 900mW Surface Mount 8-SOIC

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
FDS4897AC	onsemi
Series:	Product Status:
PowerTrench®	Obsolete
Technology:	Configuration:
MOSFET (Metal Oxide)	N and P-Channel
FET Feature:	Drain to Source Voltage (Vdss):
Logic Level Gate	40V
Current - Continuous Drain (Id) @ 25°C:	Rds On (Max) @ Id, Vgs:
6.1A, 5.2A	26mOhm @ 6.1A, 10V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
3V @ 250µA	21nC @ 10V
Input Capacitance (Ciss) (Max) @ Vds:	Power - Max:
1055pF @ 20V	900mW
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
8-SOIC (0.154", 3.90mm Width)	8-SOIC
Base Product Number:	
FDS4897	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0095	

Is Now Part of

ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

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_questions@onsemi.com.

FAIRCHILD SEMICONDUCTOR®

October 2008

FDS4897AC

Dual N & P-Channel PowerTrench® MOSFET

N-Channel: 40 V, 6.1 A, 26 mΩ P-Channel: -40 V, -5.2 A, 39 mΩ

Features

Q1: N-Channel

- Max $r_{DS(on)}$ = 26 mΩ at V_{GS} = 10 V, I_D = 6.1 A
- Max $r_{DS(on)}$ = 31 mΩ at V_{GS} = 4.5 V, I_D = 5.6 A

Q2: P-Channel

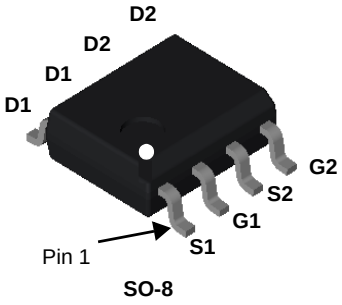
- Max $r_{DS(on)}$ = 39 mΩ at V_{GS} = -10 V, I_D = -5.2 A
- Max $r_{DS(on)}$ = 65 mΩ at V_{GS} = -4.5 V, I_D = -4.1 A
- 100% UIL Tested
- RoHS Compliant

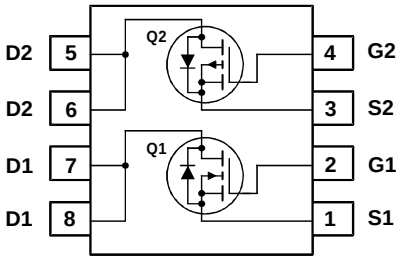
General Description

These dual N- and P-Channel MOSFETs are produced using Fairchild Semiconductor's advanced PowerTrench® process that has been especially tailored to minimize on-state resistance and yet maintain superior switching performance.

Applications

- Inverter
- Power Supplies





MOSFET Maximum Ratings T_A = 25 °C unless otherwise noted

Symbol	Parameter		Q1	Q2	Units
V_{DS}	Drain to Source Voltage		40	-40	V
V_{GS}	Gate to Source Voltage		±20	±20	V
I_D	Drain Current - Continuous		6.1	-5.2	A
	- Pulsed		24	-24	
P_D	Power Dissipation for Dual Operation		2.0		W
	Power Dissipation for Single Operation	T_A = 25 °C (Note 1a)	1.6		
		T_A = 25 °C (Note 1b)	0.9		
E_{AS}	Single Pulse Avalanche Energy	(Note 3)	37	73	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range		-55 to +150		°C

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance, Junction to Case, (Note 1)	40	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Ambient, (Note 1a)	78	

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDS4897AC	FDS4897AC	SO-8	13 ”	12 mm	2500 units

Electrical Characteristics T_J = 25 °C unless otherwise noted

Symbol	Parameter	Test Conditions	Type	Min	Typ	Max	Units
Off Characteristics							
BV_{DSS}	Drain to Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V I_D = -250 μA, V_{GS} = 0 V	Q1 Q2	40 -40			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, referenced to 25 °C I_D = -250 μA, referenced to 25 °C	Q1 Q2		37 -32		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 32 V, V_{GS} = 0 V V_{DS} = -32 V, V_{GS} = 0 V	Q1 Q2			1 -1	μA
I_{GSS}	Gate to Source Leakage Current	V_{GS} = ±20 V, V_{DS} = 0 V	Q1 Q2			±100 ±100	nA nA
On Characteristics							
$V_{GS(th)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250 μA V_{GS} = V_{DS}, I_D = -250 μA	Q1 Q2	1.5 -1.5	2.0 -2.0	3.0 -3.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	I_D = 250 μA, referenced to 25 °C I_D = -250 μA, referenced to 25 °C	Q1 Q2		-6 6		mV/°C
$r_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 6.1 A V_{GS} = 4.5 V, I_D = 5.6 A V_{GS} = 10 V, I_D = 6.1 A, T_J = 125 °C	Q1		20 24 30	26 31 39	mΩ
		V_{GS} = -10 V, I_D = -5.2 A V_{GS} = -4.5 V, I_D = -4.1 A V_{GS} = -10 V, I_D = -5.2 A, T_J = 125 °C	Q2		28 45 41	39 65 57	
g_{FS}	Forward Transconductance	V_{DD} = 5 V, I_D = 6.1 A V_{DD} = -5 V, I_D = -5.2 A	Q1 Q2		24 14		S
Dynamic Characteristics							
C_{iss}	Input Capacitance	Q1 V_{DS} = 20 V, V_{GS} = 0 V, f = 1 MHZ	Q1 Q2		795 765	1055 1015	pF
C_{oss}	Output Capacitance	Q2 V_{DS} = -20 V, V_{GS} = 0 V, f = 1 MHZ	Q1 Q2		95 135	130 180	pF
C_{rss}	Reverse Transfer Capacitance		Q1 Q2		65 80	100 120	pF
R_g	Gate Resistance		Q1 Q2		1.7 3.6		Ω
Switching Characteristics							
$t_{d(on)}$	Turn-On Delay Time	Q1 V_{DD} = 20 V, I_D = 6.1 A, V_{GS} = 10 V, R_{GEN} = 6 Ω	Q1 Q2		6 8	12 15	ns
t_r	Rise Time		Q1 Q2		2 3	10 10	ns
$t_{d(off)}$	Turn-Off Delay Time	Q2 V_{DD} = -20 V, I_D = -5.2 A, V_{GS} = -10 V, R_{GEN} = 6 Ω	Q1 Q2		17 17	30 30	ns
t_f	Fall Time		Q1 Q2		2 3	10 10	ns
$Q_{g(TOT)}$	Total Gate Charge	Q1 V_{GS} = 10 V, V_{DD} = 20 V, I_D = 6.1 A	Q1 Q2		15 15	21 20	nC
Q_{gs}	Gate to Source Charge		Q1 Q2		2.5 2.6		nC
Q_{gd}	Gate to Drain “Miller” Charge	Q2 V_{GS} = -10 V, V_{DD} = -20 V, I_D = -5.2 A	Q1 Q2		2.9 3.2		nC

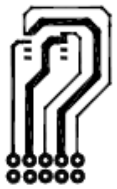
Electrical Characteristics T_J = 25 °C unless otherwise noted

Symbol	Parameter	Test Conditions	Type	Min	Typ	Max	Units
Drain-Source Diode Characteristics							
V_{SD}	Source to Drain Diode Forward Voltage	V_{GS} = 0 V, I_S = 1.3 A (Note 2) V_{GS} = 0 V, I_S = -1.3 A (Note 2)	Q1 Q2		0.75 -0.76	1.2 -1.2	V
t_{rr}	Reverse Recovery Time	Q1 I_F = 6.1 A, di/dt = 100 A/s	Q1 Q2		17 20	31 36	ns
Q_{rr}	Reverse Recovery Charge	Q2 I_F = -5.2 A, di/dt = 100 A/s	Q1 Q2		7 10	15 20	nC

Notes:

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

a) 78 °C/W when mounted on a 1 in^2 pad of 2 oz copper



b) 135 °C/W when mounted on a minimun pad

2: Pulse Test: Pulse Width < 300 μs, Duty cycle < 2.0%.

3: Starting T_J = 25 °C, N-ch: L = 3 mH, I_{AS} = 5 A, V_{DD} = 40 V, V_{GS} = 10 V; P-ch: L = 3 mH, I_{AS} = -7 A, V_{DD} = -40 V, V_{GS} = -10 V.

Typical Characteristics (Q1 N-Channel) T_J = 25 °C unless otherwise noted

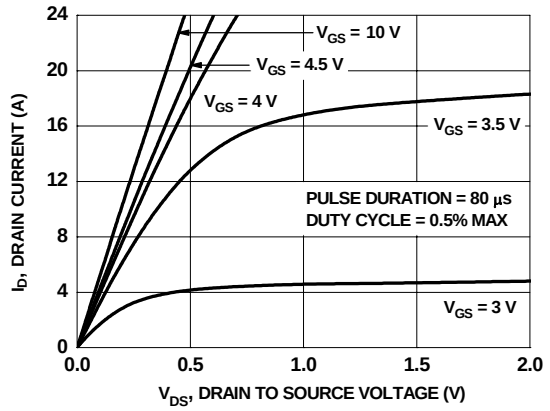


Figure 1. On Region Characteristics

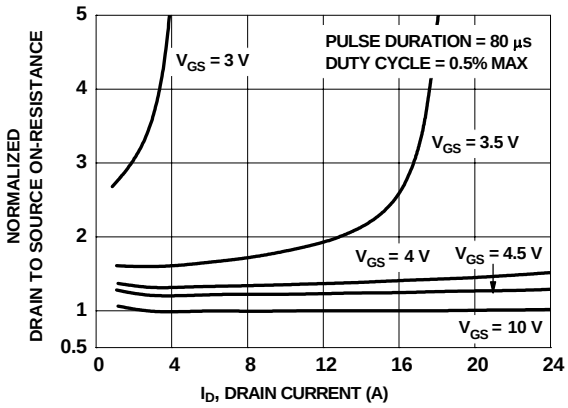


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

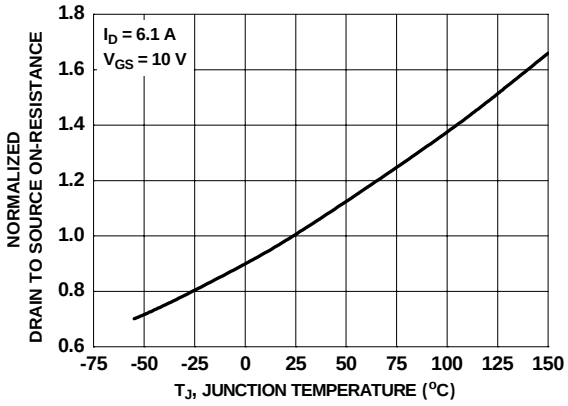


Figure 3. Normalized On Resistance vs Junction Temperature

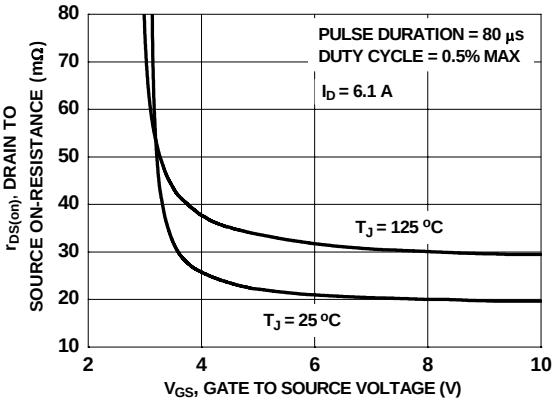


Figure 4. On-Resistance vs Gate to Source Voltage

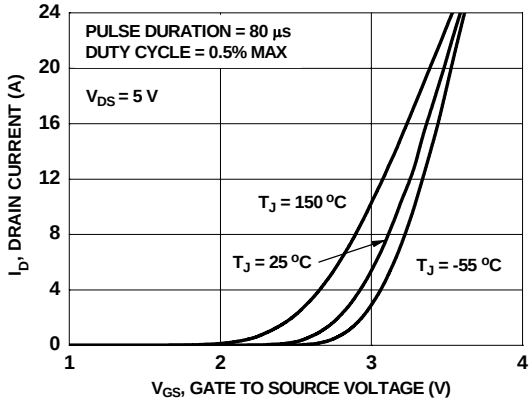


Figure 5. Transfer Characteristics

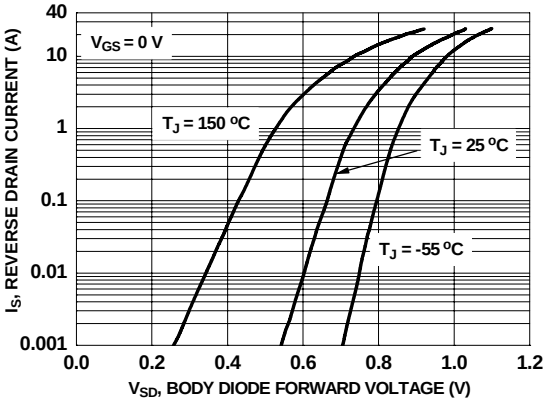


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

Typical Characteristics (Q1 N-Channel) T_J = 25 °C unless otherwise noted

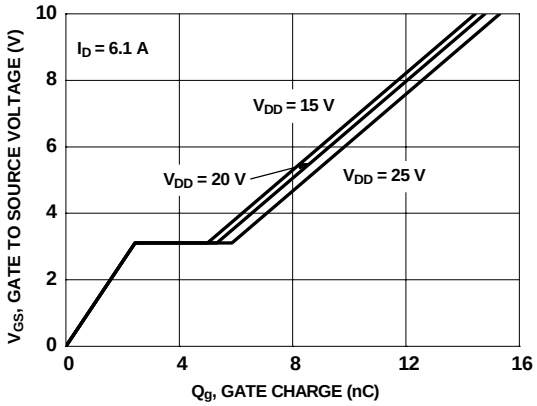


Figure 7. Gate Charge Characteristics

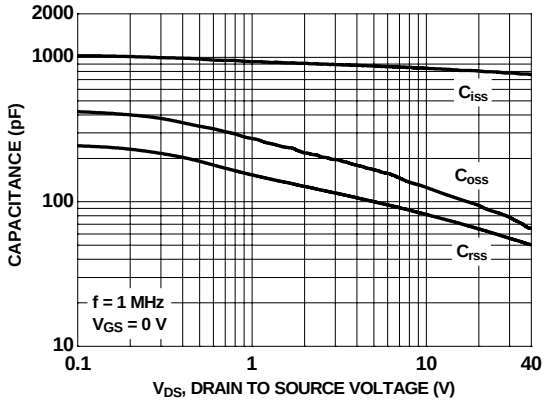


Figure 8. Capacitance vs Drain to Source Voltage

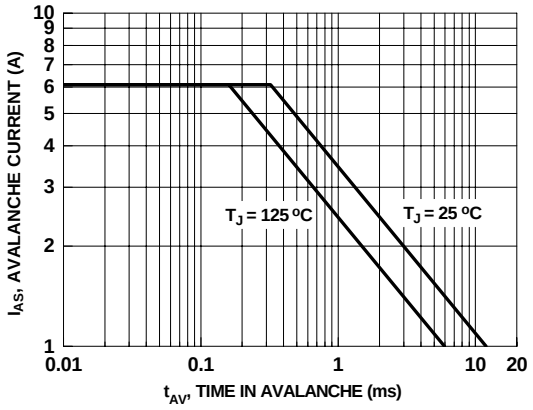


Figure 9. Unclamped Inductive Switching Capability

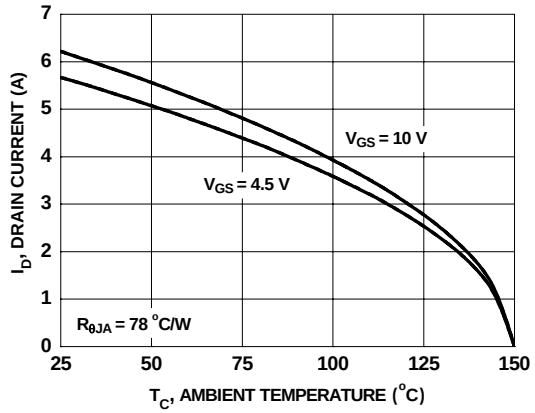


Figure 10. Maximum Continuous Drain Current vs Ambient Temperature

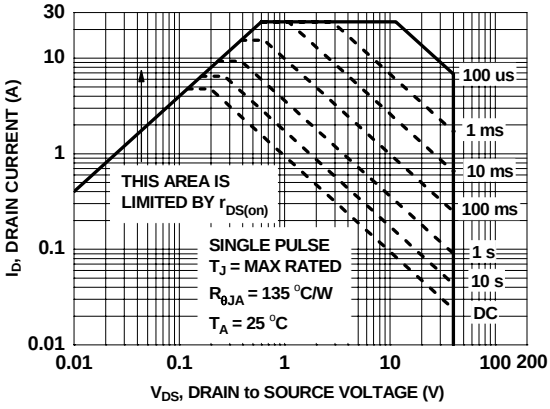


Figure 11. Forward Bias Safe Operating Area

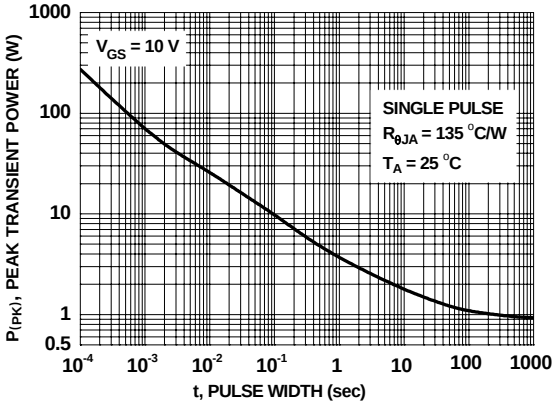


Figure 12. Single Pulse Maximum Power Dissipation

Typical Characteristics (Q1 N-Channel) T_J = 25 °C unless otherwise noted

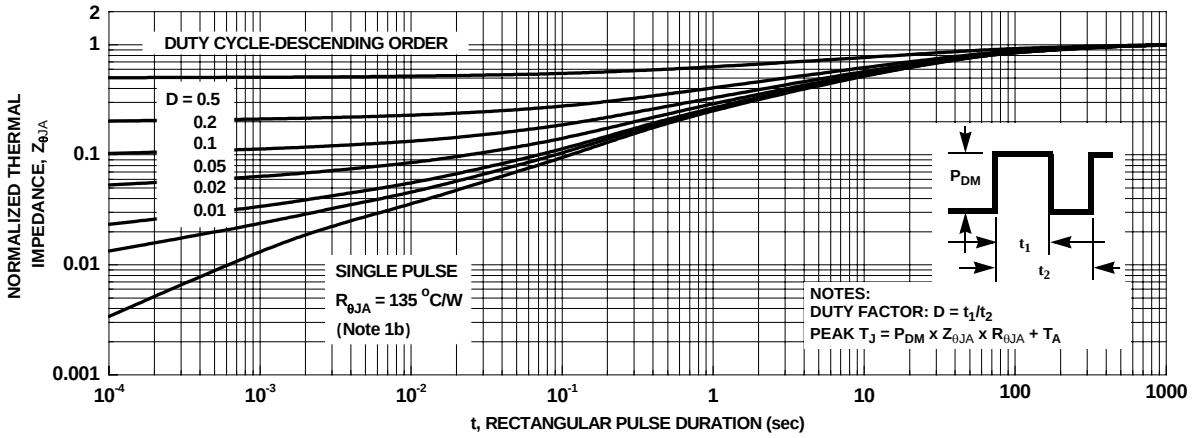


Figure 13. Junction-to-Ambient Transient Thermal Response Curve

Typical Characteristics (Q2 P-Channel) T_J = 25 °C unless otherwise noted

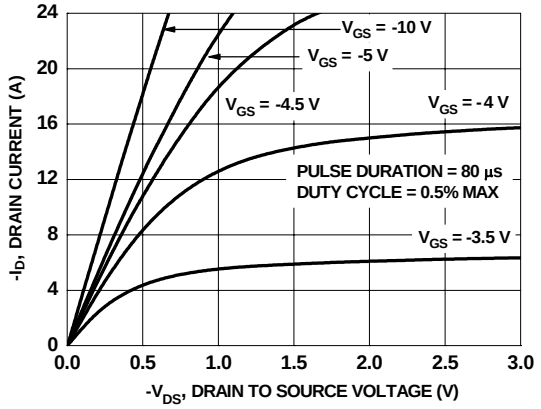


Figure 15. On- Region Characteristics

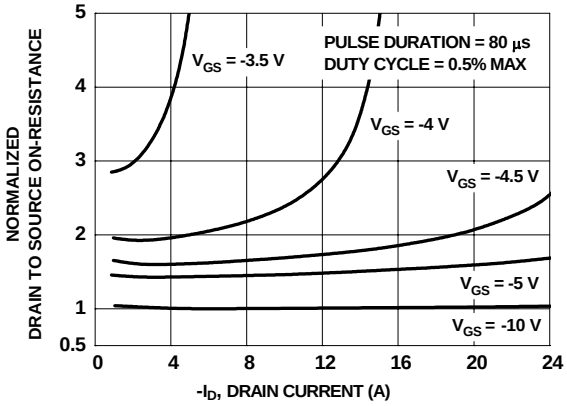


Figure 16. Normalized on-Resistance vs Drain Current and Gate Voltage

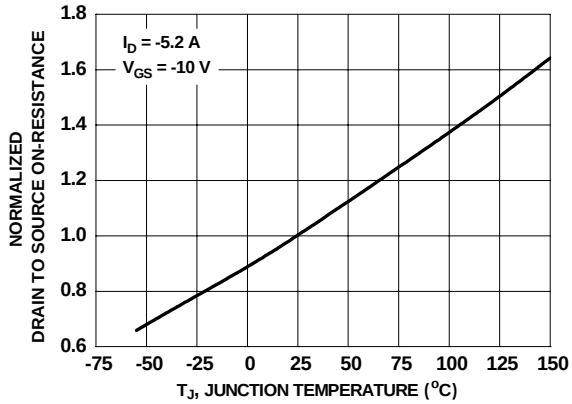


Figure 17. Normalized On-Resistance vs Junction Temperature

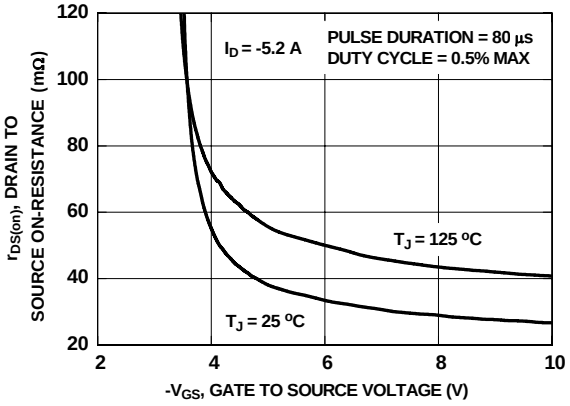


Figure 18. On-Resistance vs Gate to Source Voltage

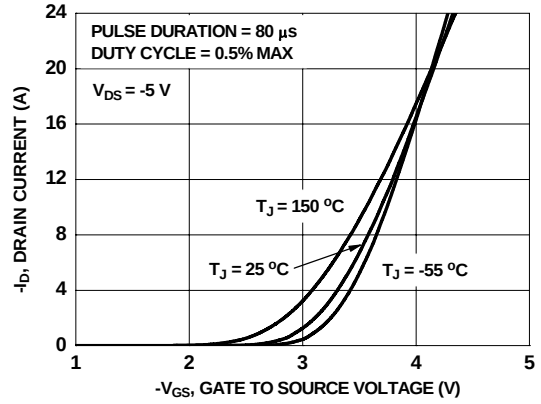


Figure 19. Transfer Characteristics

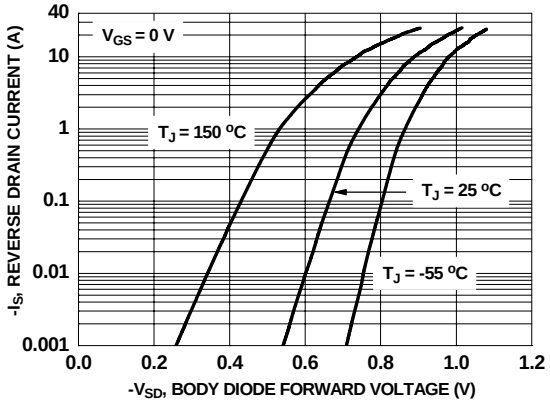


Figure 20. Source to Drain Diode Forward Voltage vs Source Current

Typical Characteristics (Q2 P-Channel) T_J = 25 °C unless otherwise noted

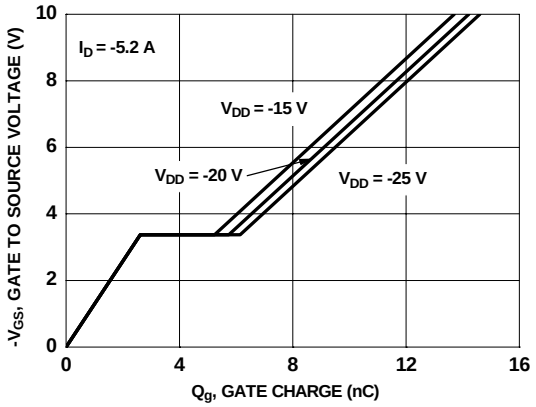


Figure 21. Gate Charge Characteristics

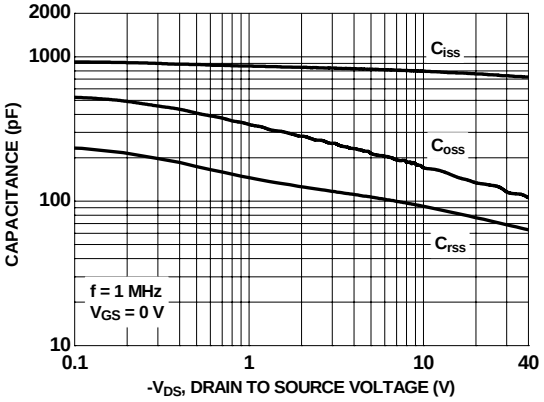


Figure 22. Capacitance vs Drain to Source Voltage

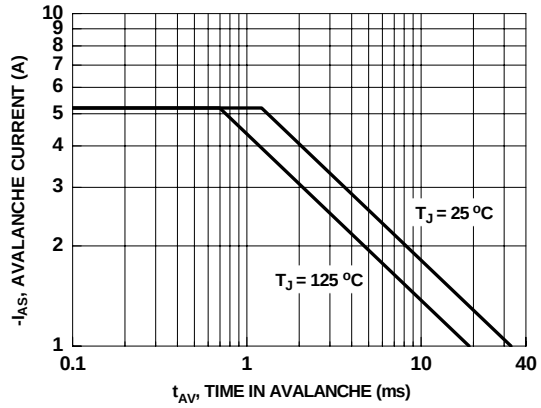


Figure 23. Unclamped Inductive Switching Capability

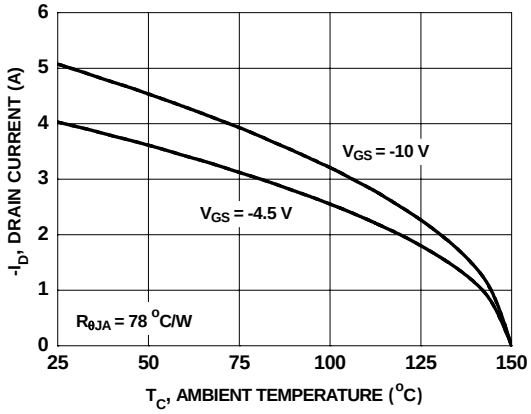


Figure 24. Maximum Continuous Drain Current vs Ambient Temperature

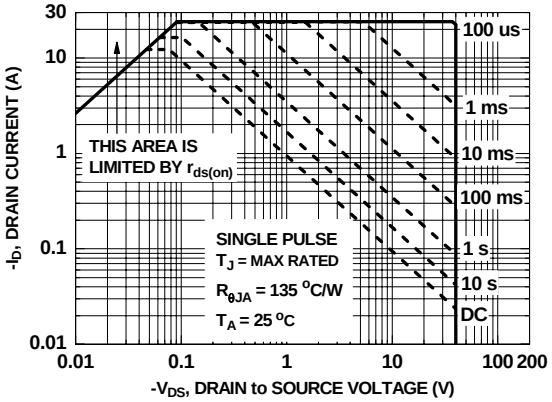


Figure 25. Forward Bias Safe Operating Area

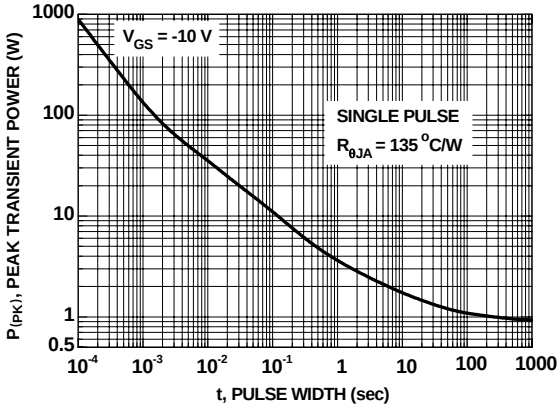


Figure 26. Single Pulse Maximum Power Dissipation

Typical Characteristics (Q2 P-Channel) T_J = 25 °C unless otherwise noted

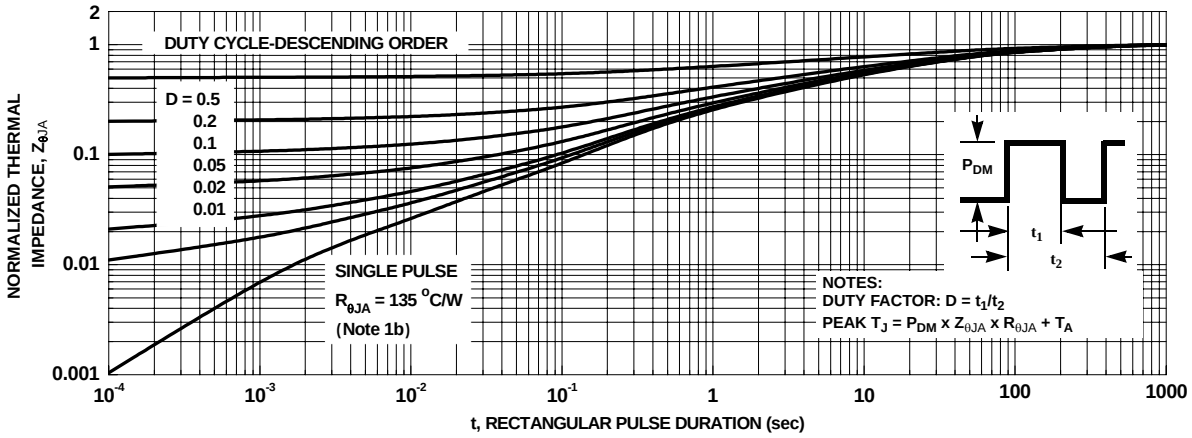


Figure 27. Junction-to-Ambient Transient Thermal Response Curve

FAIRCHILD SEMICONDUCTOR®

TRADEMARKS

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

Build it Now™
CorePLUS™
CorePOWER™
CROSSVOLT™
CTL™
Current Transfer Logic™
EcoSPARK®
EfficentMax™
EZSWITCH™ *
™
®
Fairchild®
Fairchild Semiconductor®
FACT Quiet Series™
FACT®
FAST®
FastvCore™
FlashWriter® *
FPS™
F-PFS™
FRFET®
Global Power Resource℠
Green FPS™
Green FPS™ e-Series™
GTO™
IntelliMAX™
ISOPLANAR™
MegaBuck™
MICROCOUPLER™
MicroFET™
MicroPak™
MillerDrive™
MotionMax™
Motion-SPM™
OPTOLOGIC®
OPTOPLANAR®
®
PDP SPM™
Power-SPM™
PowerTrench®
PowerXS™
Programmable Active Droop™
QFET®
QS™
Quiet Series™
RapidConfigure™
™
Saving our world, 1mW /W /kW at a time™
SmartMax™
SMART START™
SPM®
STEALTH™
SuperFET™
SuperSOT™-3
SuperSOT™-6
SuperSOT™-8
SupreMOS™
SyncFET™
SYSTEM GENERAL ®
The Power Franchise®
the power franchise
TinyBoost™
TinyBuck™
TinyLogic®
TINYOPTO™
TinyPower™
TinyPWM™
TinyWire™
μSerDes™
SerDes
UHC®
Ultra FRFET™
UniFET™
VCX™
VisualMax™
XS™

* EZSWITCH™ and FlashWriter® are trademarks of System General Corporation, used under license by Fairchild Semiconductor.

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. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

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, and (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 a significant injury of the user.
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.

ANTI-COUNTERFEITING POLICY

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Farichild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufactures of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed application, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Farichild strongly encourages customers to purchase Farichild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handing and storage and provide access to Farichild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address and warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Farichild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

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. I37

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

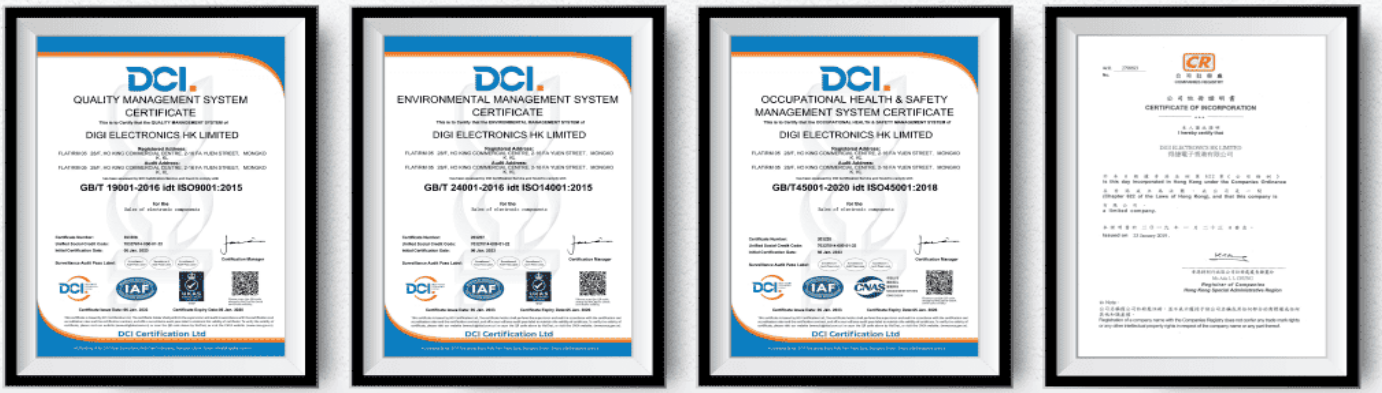
ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we striciy control the quality of products and services. Welcome your RFQ to Email: Info@DiGi-Electronics.com



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.