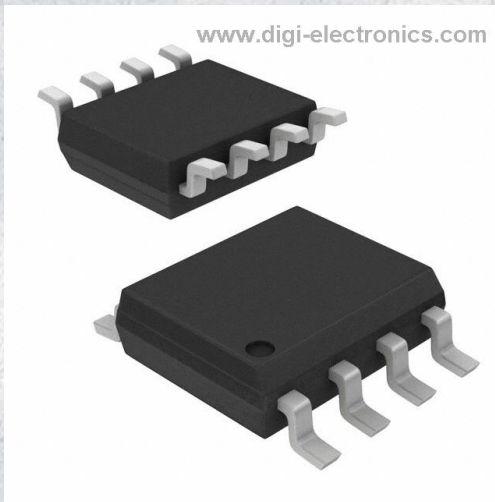


FDS6575 Datasheet



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	FDS6575-DG
Manufacturer	onsemi
Manufacturer Product Number	FDS6575
Description	MOSFET P-CH 20V 10A 8SOIC
Detailed Description	P-Channel 20 V 10A (Ta) 2.5W (Ta) Surface Mount 8-SOIC



Tel: +00 852-30501935

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Purchase and inquiry

Manufacturer Product Number:

FDS6575

Series:

PowerTrench®

FET Type:

P-Channel

Drain to Source Voltage (Vdss):

20 V

Drive Voltage (Max Rds On, Min Rds On):

2.5V, 4.5V

Vgs(th) (Max) @ Id:

1.5V @ 250µA

Vgs (Max):

±8V

FET Feature:

-

Operating Temperature:

-55°C ~ 175°C (Tj)

Supplier Device Package:

8-SOIC

Base Product Number:

FDS65

Manufacturer:

onsemi

Product Status:

Active

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

10A (Ta)

Rds On (Max) @ Id, Vgs:

13mOhm @ 10A, 4.5V

Gate Charge (Qg) (Max) @ Vgs:

74 nC @ 4.5 V

Input Capacitance (Ciss) (Max) @ Vds:

4951 pF @ 10 V

Power Dissipation (Max):

2.5W (Ta)

Mounting Type:

Surface Mount

Package / Case:

8-SOIC (0.154", 3.90mm Width)

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99



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September 2001

FDS6575

FDS6575

P-Channel 2.5V Specified PowerTrench[®] MOSFET

General Description

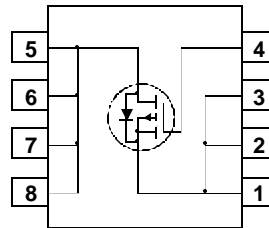
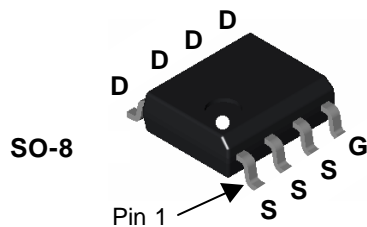
This PChannel 2.5V specified MOSFET is a rugged gate version of Fairchild Semiconductor's advanced PowerTrench process. It has been optimized for power management applications with a wide range of gate drive voltage (2.5V – 8V).

Applications

- Power management
- Load switch
- Battery protection

Features

- -10 A, -20 V. $R_{DS(ON)} = 13 \text{ m}\Omega @ V_{GS} = -4.5 \text{ V}$
 $R_{DS(ON)} = 17 \text{ m}\Omega @ V_{GS} = -2.5 \text{ V}$
- Low gate charge
- High performance trench technology for extremely low $R_{DS(ON)}$
- High current and power handling capability



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

Symbol	Parameter	Rated	Units
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 8	V
I_b	Drain Current – Continuous (Note 1a) – Pulsed	-10	A
		-50	
P_D	Power Dissipation for Single Operation (Note 1a) (Note 1b) (Note 1c)	2.5	W
		1.5	
		1.2	
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ\text{C}$

Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1a)	50	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1c)	125	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 1)	25	$^\circ\text{C/W}$

Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape width	Quantity
FDS6575	FDS6575	13"	12mm	2500 units

Electrical Characteristics

T_A = 25°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 V, I _b = –250 μA	–20			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I _b = –250 μA, Referenced to 25°C		–13		mV/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = –16 V, V _{GS} = 0 V			–1	μA
I _{GSSF}	Gate–Body Leakage, Forward	V _{GS} = 8 V, V _{DS} = 0 V			100	nA
I _{GSSR}	Gate–Body Leakage, Reverse	V _{GS} = –8 V, V _{DS} = 0 V			–100	nA

On Characteristics (Note 2)

V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _b = –250 μA	–0.4	–0.6	–1.5	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	I _b = –250 μA, Referenced to 25°C		3		mV/°C
R _{DS(on)}	Static Drain–Source On–Resistance	V _{GS} = –4.5 V, I _b = –10 A V _{GS} = –2.5 V, I _b = –9 A V _{GS} = –4.5 V, I _b = –10 A, T _J = 125°C		8.5 11 11	13 17 20	mΩ
I _{D(on)}	On–State Drain Current	V _{GS} = –4.5 V, V _{DS} = –5 V	–50			A
g _{FS}	Forward Transconductance	V _{DS} = –5 V, I _b = –10 A		57		S

Dynamic Characteristics

C _{iss}	Input Capacitance	V _{DS} = –10 V, V _{GS} = 0 V,		4951		pF
C _{oss}	Output Capacitance	f = 1.0 MHz		884		pF
C _{rss}	Reverse Transfer Capacitance			451		pF

Switching Characteristics (Note 2)

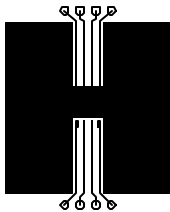
t _{d(on)}	Turn–On Delay Time	V _{DD} = –10 V, I _b = –1 A,		16	29	ns
t _r	Turn–On Rise Time	V _{GS} = –4.5 V, R _{GEN} = 6 Ω		9	18	ns
t _{d(off)}	Turn–Off Delay Time			196	314	ns
t _f	Turn–Off Fall Time			78	125	ns
Q _g	Total Gate Charge	V _{DS} = –10 V, I _b = –10 A,		53	74	nC
Q _{gs}	Gate–Source Charge	V _{GS} = –4.5 V		6		nC
Q _{gd}	Gate–Drain Charge			12		nC

Drain–Source Diode Characteristics and Maximum Ratings

I _S	Maximum Continuous Drain–Source Diode Forward Current				–2.1	A
V _{SD}	Drain–Source Diode Forward Voltage	V _{GS} = 0 V, I _S = –2.1 A (Note 2)		–0.6	–1.2	V

Notes:

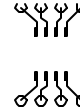
- R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design while R_{θCA} is determined by the user's board design.



a) 50 °C/W when mounted on a 1 in² pad of 2 oz copper



b) 105 °C/W when mounted on a .04 in² pad of 2 oz copper



c) 125 °C/W when mounted on a minimum pad.

Scale 1 : 1 on letter size paper

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

Typical Characteristics

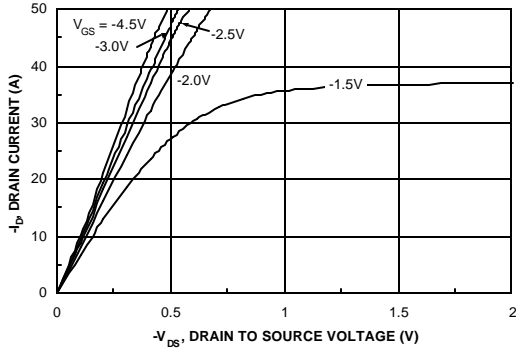


Figure 1. On-Region Characteristics.

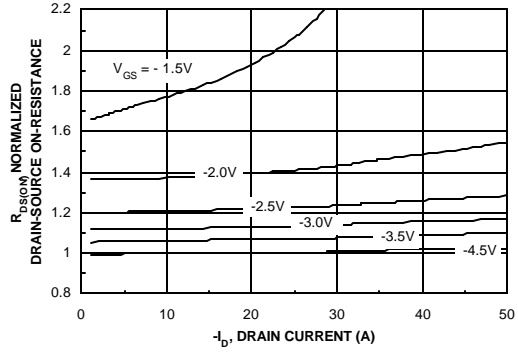


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

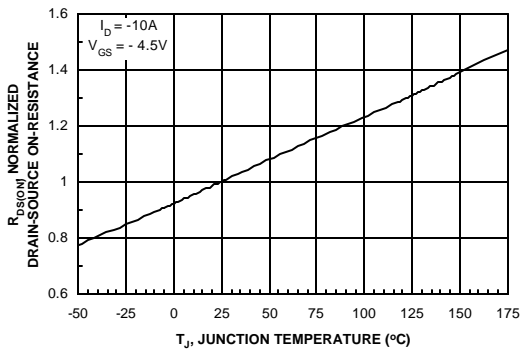


Figure 3. On-Resistance Variation with Temperature.

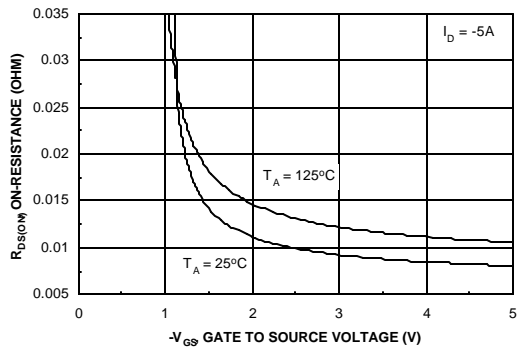


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

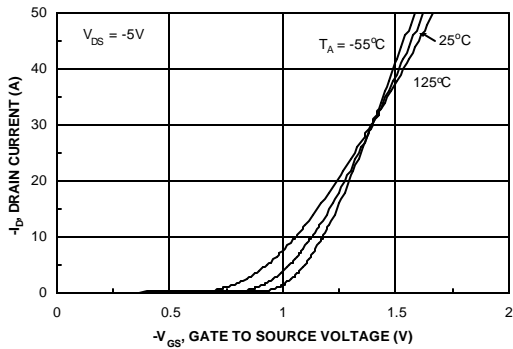


Figure 5. Transfer Characteristics.

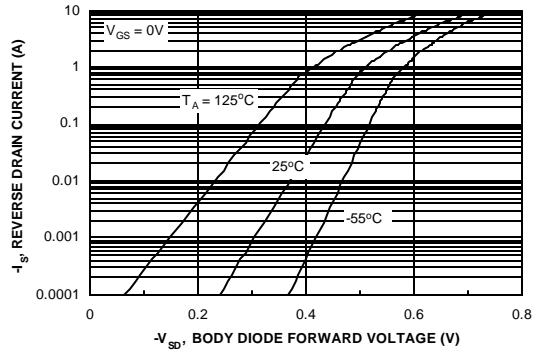


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

Typical Characteristics

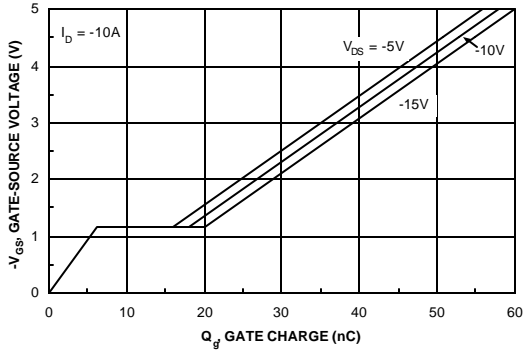


Figure 7. Gate Charge Characteristics.

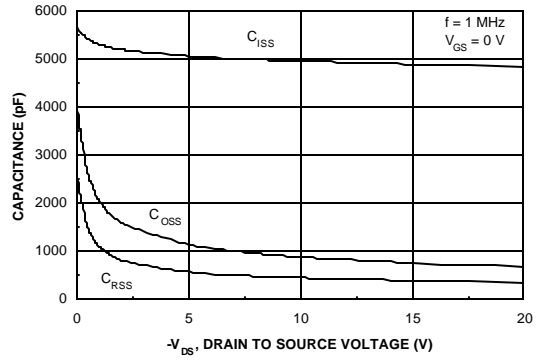


Figure 8. Capacitance Characteristics.

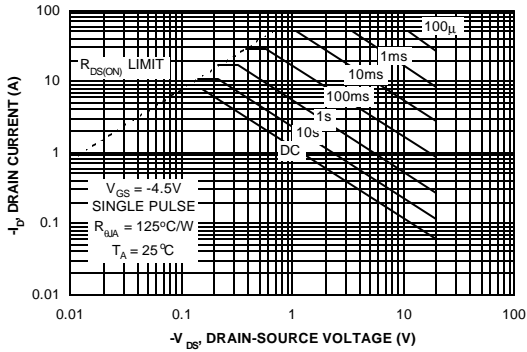


Figure 9. Maximum Safe Operating Area.

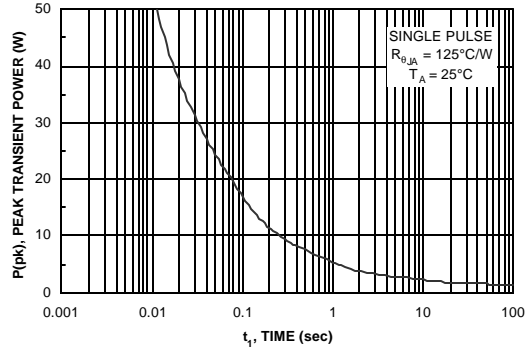


Figure 10. Single Pulse Maximum Power Dissipation.

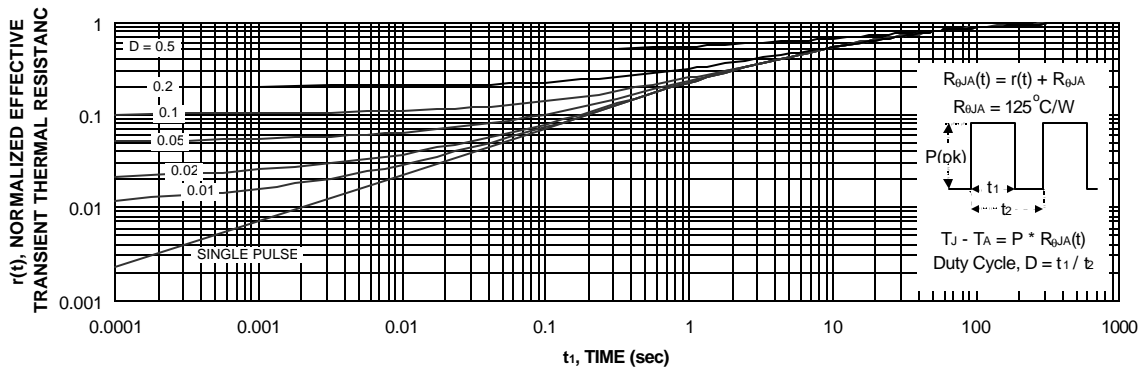


Figure 11. Transient Thermal Response Curve.

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

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