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FAIRCHILD SEMICONDUCTOR™

April 1999
ADVANCE INFORMATION

FDR6580

N-Chennal 2.5V Specified PowerTrench™ MOSFET

General Description

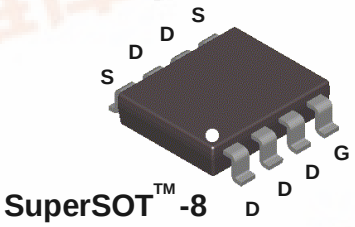
This N-Channel 2.5V specified MOSFET is produced using Fairchild Semiconductor's advanced PowerTrench process that has been especially tailored to minimize the on-state resistance and yet maintain low gate charge for superior switching performance.

Applications

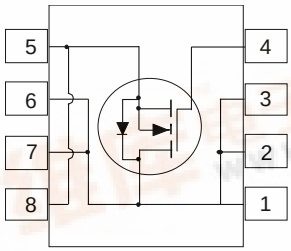
- Load switch
- Motor driving
- Power Management

Features

- 11 A, 20 V. $R_{DS(ON)}$ = 0.009 Ω @ V_{GS} = 4.5 V
  $R_{DS(ON)}$ = 0.013 Ω @ V_{GS} = 2.5 V.
- Low gate charge.
- High performance trench technology for extremely low $R_{DS(ON)}$.
- Small footprint (38% smaller than a standard SO-8); low profile package (1 mm thick); power handling capability similar to SO-8.



SuperSOT™ -8



Absolute Maximum Ratings

T_A = 25°C unless otherwise noted

Symbol	Parameter		Ratings	Units
V_{DSS}	Drain-Source Voltage		20	V
V_{GSS}	Gate-Source Voltage		±8	V
I_D	Drain Current - Continuous	(Note 1a)	11	A
	- Pulsed		50	
P_D	Power Dissipation for Single Operation	(Note 1a)	1.8	W
		(Note 1b)	1.0	
		(Note 1c)	0.9	
T_J, T_{stg}	Operating and Storage Junction Temperature Range		-55 to +150	°C

Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	(Note 1a)	70	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	(Note 1)	20	°C/W

Package Outlines and Ordering Information

Device Marking	Device	Reel Size	Tape Width	Quantity
.6580	FDR6580	13"	12mm	3000 units

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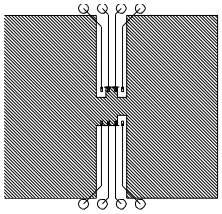
Electrical Characteristics T_A=25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	20			V
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			10	μA
I_{GSSR}	Gate-Body Leakage, Reverse	V_{GS} = -8 V, V_{DS} = 0 V			-10	μA
ON CHARACTERISTICS (Note 2)						
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 μA	0.4		1.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 4.5 V, I_D = 11 A V_{GS} = 2.5 V, I_D = 9.3 A			0.009 0.013	Ω
$I_{D(ON)}$	On-State Drain Current	V_{GS} = 4.5 V, V_{DS} = 5 V	25			A
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I_S	Maximum Continuous Drain-Source Diode Forward Current				1.5	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 1.5 A (Note 2)			1.2	V

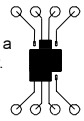
Notes:

1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient 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.

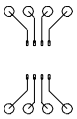


Scale 1 : 1 on letter size paper

a) 70° C/W when mounted on a 1.0 in² pad of 2 oz. copper.



b) 125° C/W when mounted on a 0.026 in² pad of 2oz. copper.



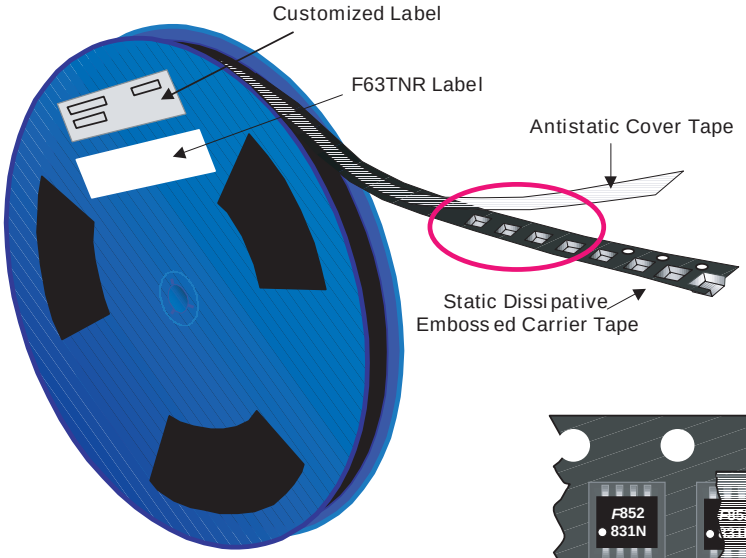
c) 135° C/W when mounted on a minimum pad.

2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

SuperSOT™-8 Tape and Reel Data and Package Dimensions

FAIRCHILD SEMICONDUCTOR™

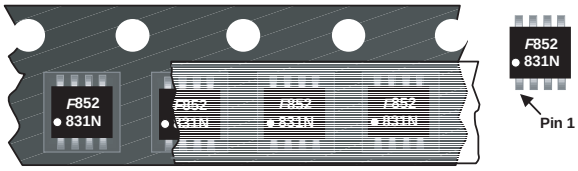
SSOT-8 Packaging Configuration: Figure 1.0



Packaging Description:

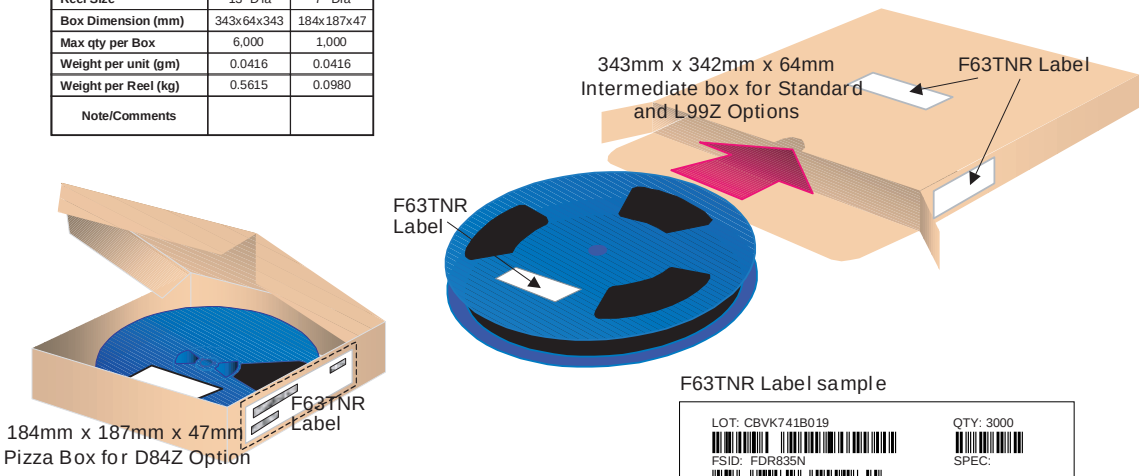
SSOT-8 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 13" or 330cm diameter reel. The reels are dark blue in color and is made of polystyrene plastic (anti-static coated). Other option comes in 500 units per 7" or 177cm diameter reel. This and some other options are further described in the Packaging Information table.

These full reels are individually barcode labeled and placed inside a standard intermediate box (illustrated in figure 1.0) made of recyclable corrugated brown paper. One box contains two reels maximum. And these boxes are placed inside a barcode labeled shipping box which comes in different sizes depending on the number of parts shipped.



SSOT-8 Unit Orientation

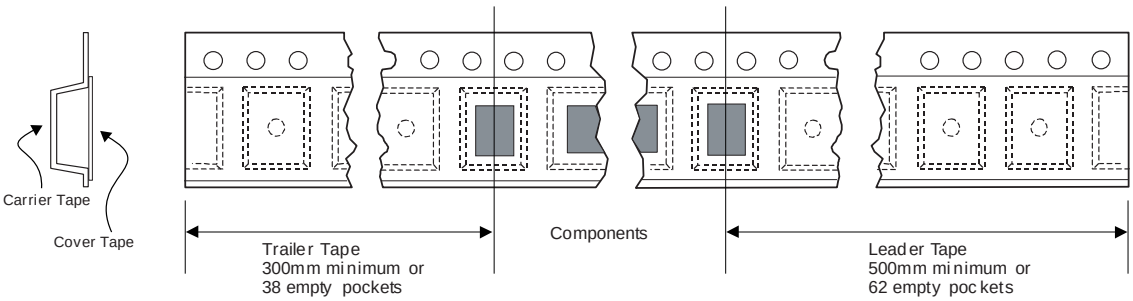
SSOT-8 Packaging Information		
Packaging Option	Standard (no flow code)	D84Z
Packaging type	TNR	TNR
Qty per Reel/Tube/Bag	3,000	500
Reel Size	13" Dia	7" Dia
Box Dimension (mm)	343x64x343	184x187x47
Max qty per Box	6,000	1,000
Weight per unit (gm)	0.0416	0.0416
Weight per Reel (kg)	0.5615	0.0980
Note/Comments		



F63TNR Label sample

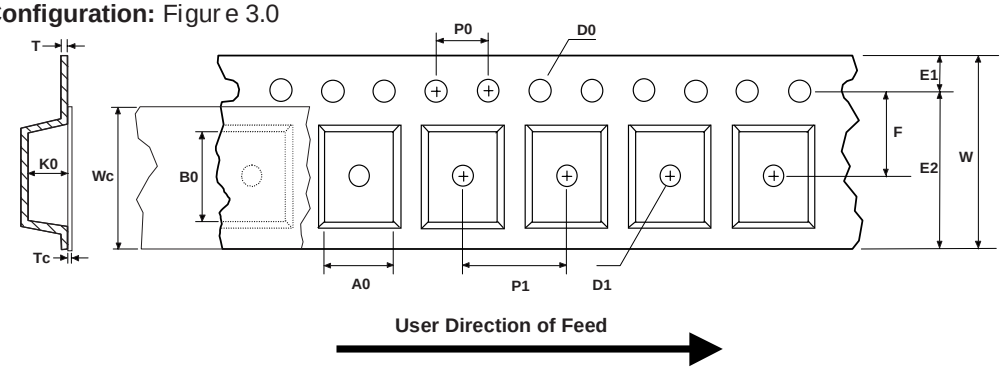
LOT: CBVK741B019 QTY: 3000
FSID: FDR835N SPEC:
D/C1: D9842 QTY1: SPEC REV:
D/C2: QTY2: CPN:
N/F: F (F63TNR)3

SSOT-8 Tape Leader and Trailer Configuration: Figure 2.0



SuperSOT™-8 Tape and Reel Data and Package Dimensions, continued

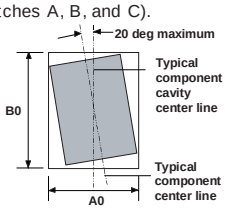
SSOT-8 Embossed Carrier Tape Configuration: Figure 3.0



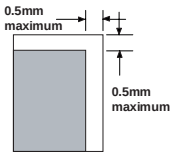
Dimensions are in millimeter														
Pkg type	**A0**	**B0**	**W**	**D0**	**D1**	**E1**	**E2**	**F**	**P1**	**P0**	**K0**	**T**	**Wc**	**Tc**
SSOT-8 (12mm)	4.47 +/-0.10	5.00 +/-0.10	12.0 +/-0.3	1.55 +/-0.05	1.50 +/-0.10	1.75 +/-0.10	10.25 min	5.50 +/-0.05	8.0 +/-0.1	4.0 +/-0.1	1.37 +/-0.10	0.280 +/-0.150	9.5 +/-0.025	0.06 +/-0.02

Notes: A0, B0, and K0 dimensions are determined with respect to the EIA/Jedec RS-481 rotational and lateral movement requirements (see sketches A, B, and C).

Sketch A (Side or Front Sectional View)
Component Rotation

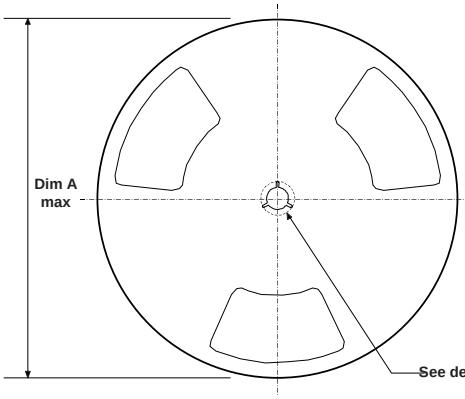


Sketch B (Top View)
Component Rotation

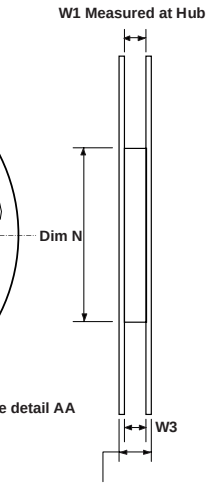


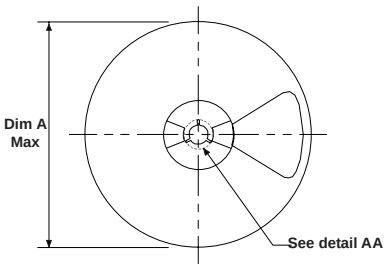
Sketch C (Top View)
Component lateral movement

SSOT-8 Reel Configuration: Figure 4.0

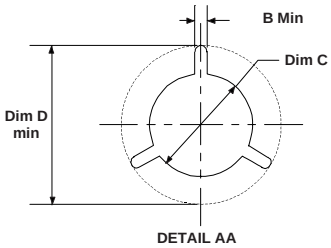


13" Diameter Option



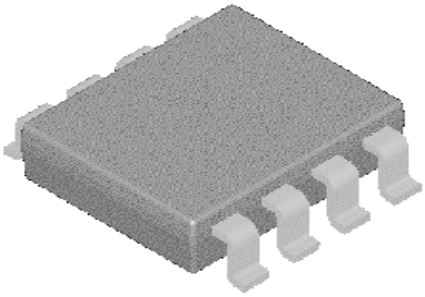


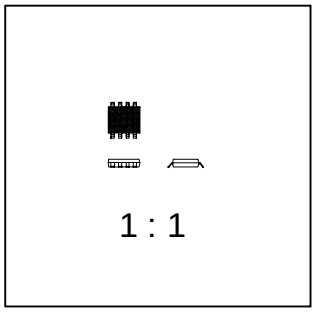
7" Diameter Option



Dimensions are in inches and millimeters									
Tape Size	**Reel Option**	**Dim A**	**Dim B**	**Dim C**	**Dim D**	**Dim N**	**Dim W1**	**Dim W2**	**Dim W3 (LSL-USL)**
12mm	7" Dia	7.00 177.8	0.059 1.5	512 +0.020/-0.008 13 +0.5/-0.2	0.795 20.2	5.906 150	0.488 +0.078/-0.000 12.4 +2/0	0.724 18.4	0.469 – 0.606 11.9 – 15.4
12mm	13" Dia	13.00 330	0.059 1.5	512 +0.020/-0.008 13 +0.5/-0.2	0.795 20.2	7.00 178	0.488 +0.078/-0.000 12.4 +2/0	0.724 18.4	0.469 – 0.606 11.9 – 15.4

SuperSOT™-8 (FS PKG Code 34, 35)

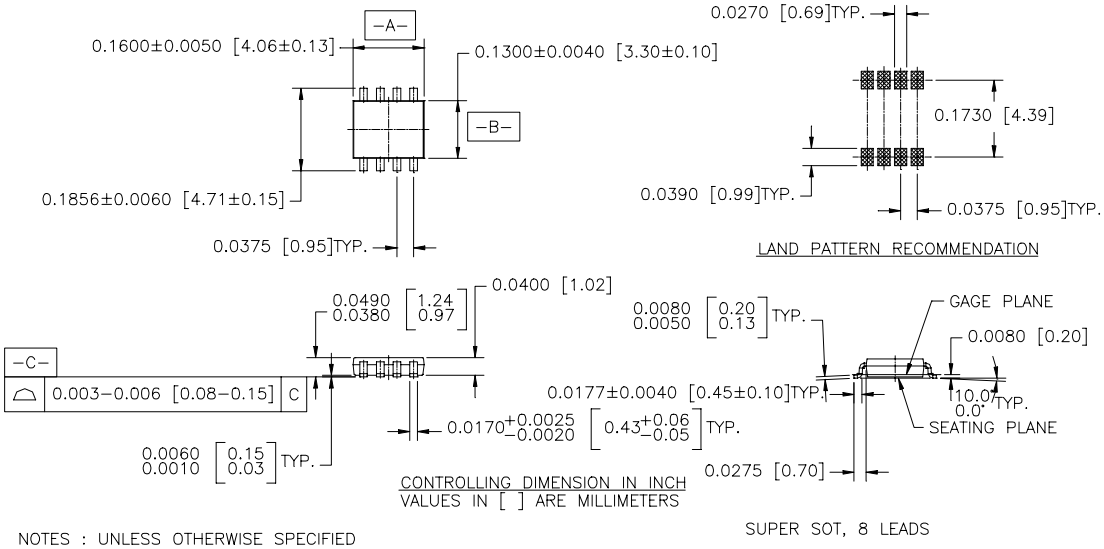




Scale 1:1 on letter size paper

Dimensions shown below are in:
inches [millimeters]

Part Weight per unit (gram): 0.0416



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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.
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