MOSFET – N-Channel, Logic Level, POWERTRENCH®

60 V, 1.6 A, 98 mΩ

FDN5632N-F085

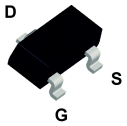
V_{DDS}	$r_{DS(on)}$ MAX	I_D MAX
60 V	82 mΩ @ 10 V	1.6 A
	98 mΩ @ 4.5 V	

Features

- $R_{DS(on)}$ = 98 mΩ at V_{GS} = 4.5 V, I_D = 1.6 A
- $R_{DS(on)}$ = 82 mΩ at V_{GS} = 10 V, I_D = 1.7 A
- Typ $Q_{g(TOT)}$ = 9.2 nC at V_{GS} = 10 V
- Low Miller Charge
- UIS Capability
- AEC−Q101 Qualified and PPAP Capable
- This Device is Pb−Free, Halide Free and is RoHS Compliant

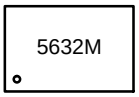
Applications

- DC/DC Converter
- Motor Drives



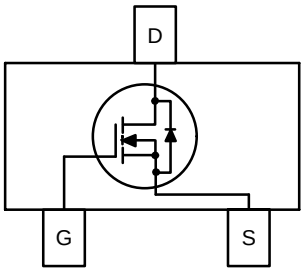
SOT−23/SUPERSOT™−23, 3 LEAD, 1.4x2.9
CASE 527AG

MARKING DIAGRAM



5632 = Specific Device Code
M = Date Code

PIN ASSIGNMENT



ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

MOSFET MAXIMUM RATINGS (T_A = 25°C, unless otherwise noted)

Symbol	Parameter	Ratings	Unit
V_{DSS}	Drain to Source Voltage	60	V
V_{GS}	Gate to Source Voltage	±20	V
I_D	Drain Current Continuous (V_{GS} = 10 V)	1.7	A
	Pulsed	10	
E_{AS}	Single Pulse Avalanche Energy (Note 1)	74	mJ
P_D	Power Dissipation	1.1	W
T_J, T_{STG}	Operating and Storage Temperature	−55 to +150	°C
$R_{\theta JC}$	Thermal Resistance Junction to Case	75	°C/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient TO−252, 1 in^2 Copper Pad Area	111	°C/W

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. E_{AS} of 74 mJ is 100% test at L = 80 mH, I_{AS} = 1.4 A, starting T_J = 25°C

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
B_{VDSS}	Drain to Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V	60	–	–	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 48 V, V_{GS} = 0 V	–	–	1	μA
		V_{DS} = 48 V, V_{GS} = 0 V, T_A = 125°C	–	–	250	
I_{GSS}	Gate to Source Leakage Current	V_{GS} = ±20 V	–	–	±100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250 μA	1	2.0	3	V
$r_{DS(on)}$	Drain to Source On Resistance	I_D = 1.7 A, V_{GS}= 10 V	–	57	82	mΩ
		I_D = 1.6 A, V_{GS}= 6 V	–	62	88	
		I_D = 1.6 A, V_{GS}= 4.5 V	–	70	98	
		I_D = 1.7 A, V_{GS}= 10 V, T_A = 150°C	–	107	135	
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz	–	475	–	pF
C_{oss}	Output Capacitance		–	60	–	pF
C_{rss}	Reverse Transfer Capacitance		–	30	–	pF
R_G	Gate Resistance	f = 1MHz	–	1.4	–	Ω
$Q_{g(TOT)}$	Total Gate Charge at 10 V	V_{GS} = 0 to 10 V, V_{DD} = 20 V, I_D = 1.7 A	–	9.2	12	nC
Q_{gs}	Gate to Source Gate Charge	V_{DD} = 20 V, I_D = 1.7 A	–	1.5	–	nC
Q_{gd}	Gate to Drain “Miller” Charge		–	1.4	–	nC
SWITCHING CHARACTERISTICS						
t_{on}	Turn−On Time	V_{DD} = 30 V, I_D = 1.0 A, V_{GS} = 10 V, R_{GEN} = 6 Ω	–	–	30	ns
$t_{d(on)}$	Turn−On Delay Time		–	15	–	ns
t_r	Rise Time		–	1.7	–	ns
$t_{d(off)}$	Turn−Off Delay Time		–	5.2	–	ns
t_f	Fall Time		–	1.3	–	ns
t_{off}	Turn−Off Time		–	–	12.9	ns
DRAIN−SOURCE DIODE CHARACTERISTICS						
V_{SD}	Source to Drain Diode Voltage	I_{SD} = 1.7 A	–	0.8	1.25	V
		I_{SD} = 0.85 A	–	0.8	1.0	
t_{rr}	Reverse Recovery Time	I_{SD} = 1.7 A, dI_{SD}/dt = 100 A/μs	–	16.0	21	ns
Q_{rr}	Reverse Recovery Charge		–	7.9	10.3	nC

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

TYPICAL CHARACTERISTICS

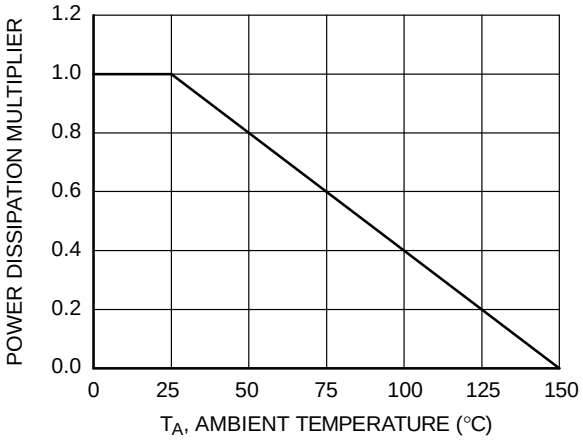

Figure 1. Normalized Power Dissipation vs. Case Temperature

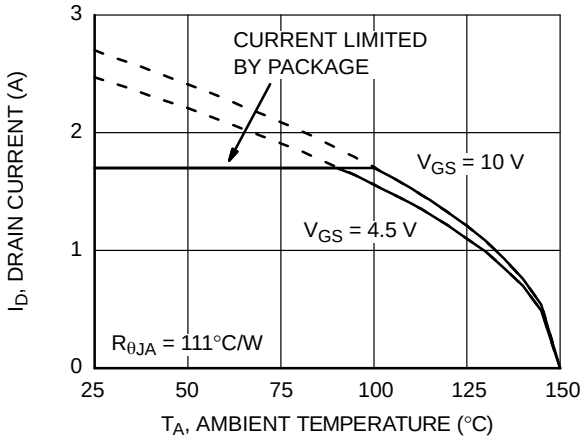

Figure 2. Maximum Continuous Drain Current vs. Case Temperature

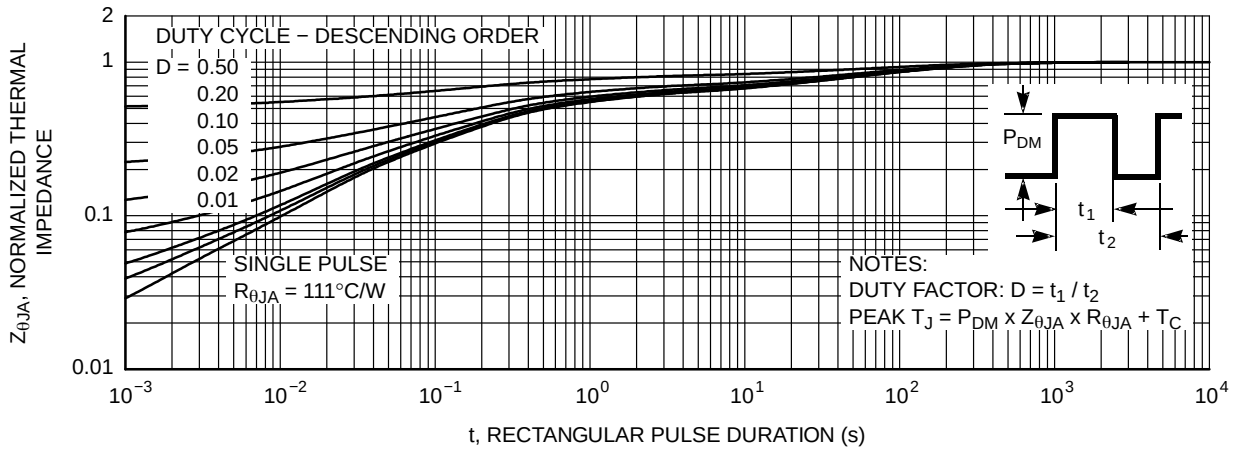

Figure 3. Normalized Maximum Transient Thermal Impedance

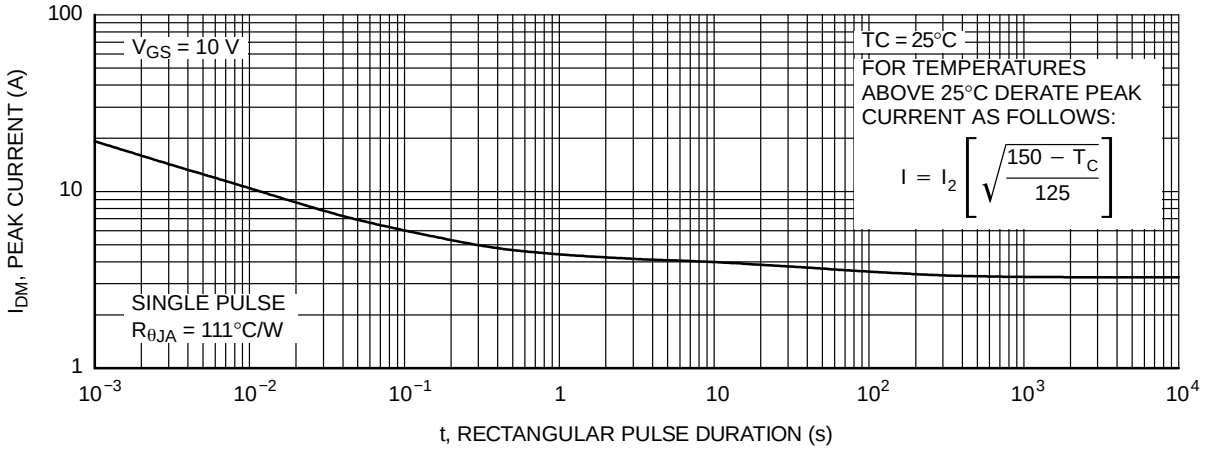

Figure 4. Peak Current Capability

TYPICAL CHARACTERISTICS

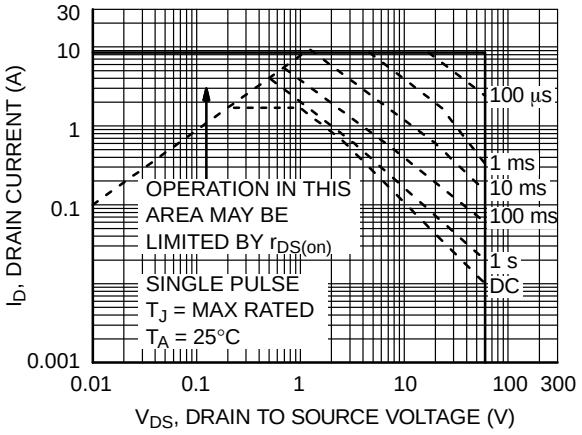

Figure 5. Forward Bias Safe Operating Area

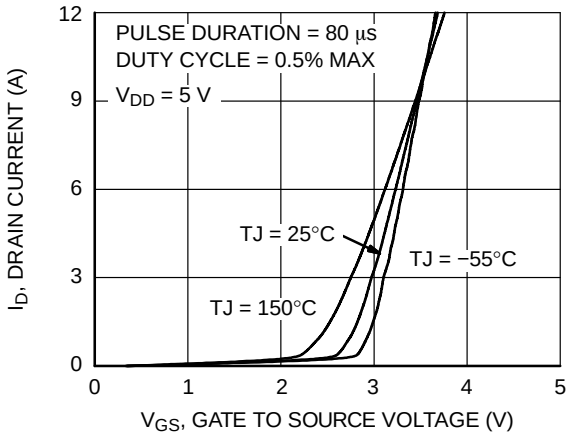

Figure 6. Transfer Characteristics

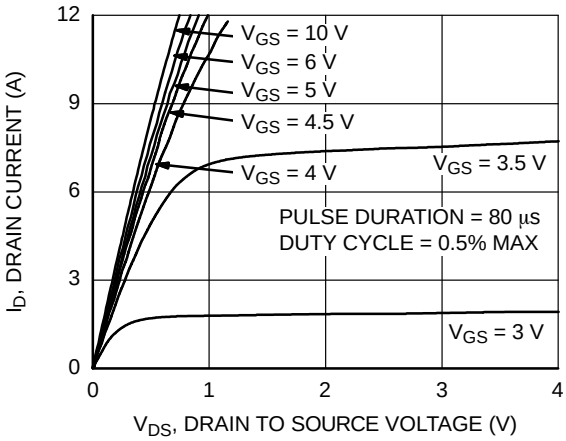

Figure 7. Saturation Characteristics

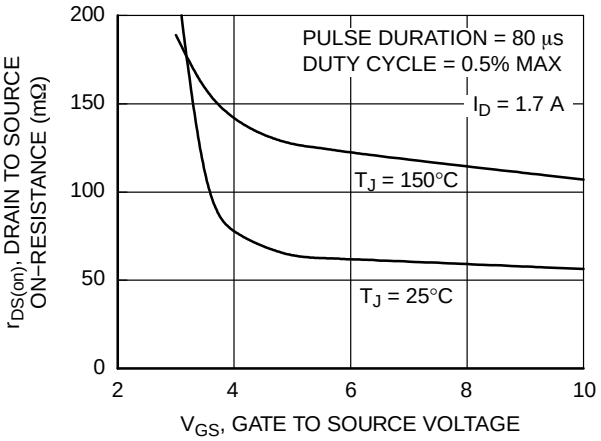

Figure 8. Drain to Source On−Resistance Variation vs. Gate to Source Voltage

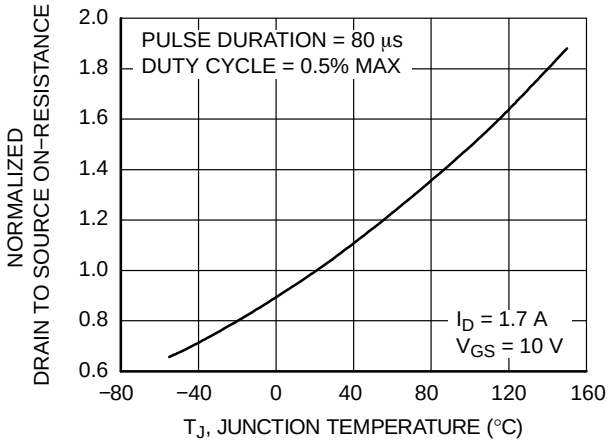

Figure 9. Normalized Drain to Source On Resistance vs. Junction Temperature

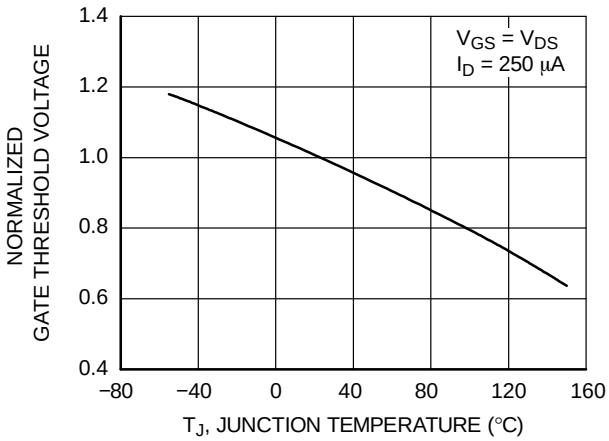

Figure 10. Normalized Gate Threshold Voltage vs. Junction Temperature

TYPICAL CHARACTERISTICS

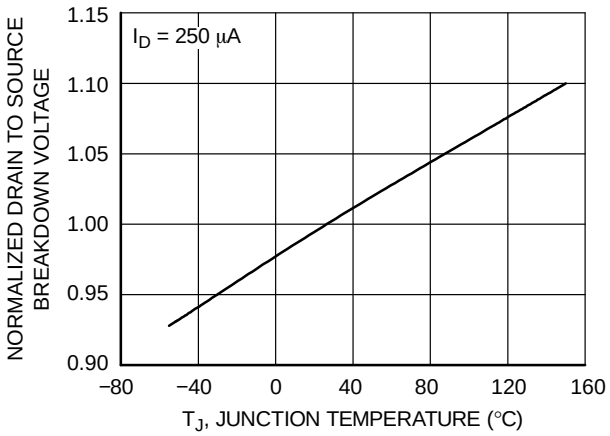

Figure 11. Normalized Drain to Source Breakdown Voltage vs. Junction Temperature

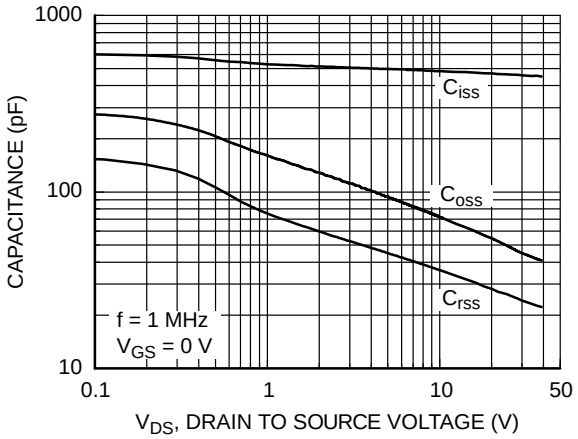

Figure 12. Capacitance vs. Drain to Source Voltage

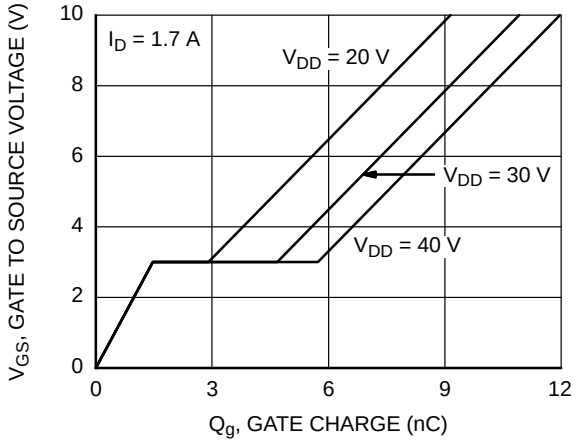

Figure 13. Gate Charge vs. Gate to Source Voltage

PACKAGE MARKING AND ORDERING INFORMATION

Device	Device Marking	Package	Reel Size	Tape Width	Shipping†
FDN5632N−F085	5632	SOT−23/SUPERSOT−23, 3 LEAD, 1.4x2.9 (Pb−Free, Halide Free)	7”	8 mm	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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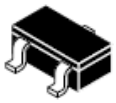
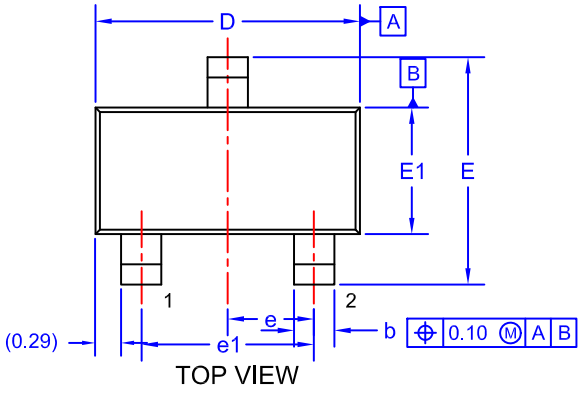


SOT−23/SUPERSOT™ −23, 3 LEAD, 1.4x2.9
CASE 527AG
ISSUE A

DATE 09 DEC 2019

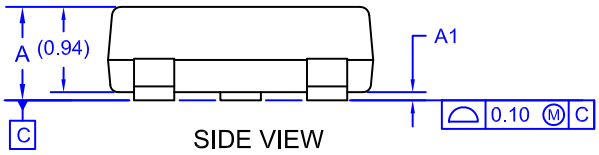


TOP VIEW

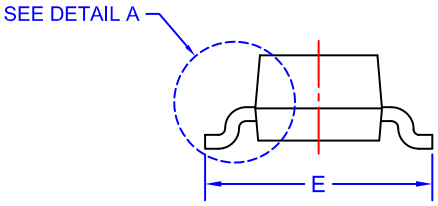
NOTES: UNLESS OTHERWISE SPECIFIED

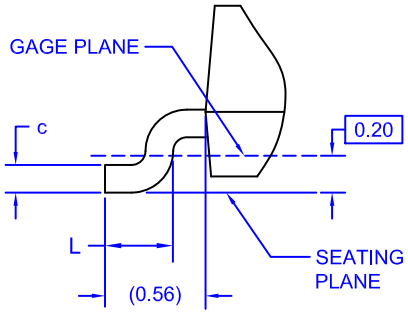
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.

DIM	MIN.	NOM.	MAX.
A	0.85	0.95	1.12
A1	0.00	0.05	0.10
b	0.370	0.435	0.508
c	0.085	0.150	0.180
D	2.80	2.92	3.04
E	2.31	2.51	2.71
E1	1.20	1.40	1.52
e	0.95 BSC		
e1	1.90 BSC		
L	0.33	0.38	0.43

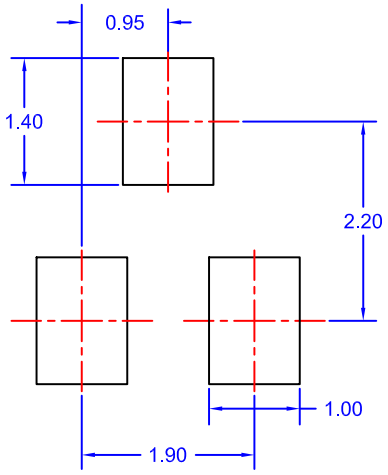


SIDE VIEW





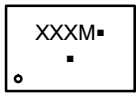
DETAIL A



LAND PATTERN RECOMMENDATION*

*FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

GENERIC MARKING DIAGRAM*



XXX = Specific Device Code
M = Month Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

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DESCRIPTION:	**SOT−23/SUPERSOT−23, 3 LEAD, 1.4X2.9**	**PAGE 1 OF 1**

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