Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D T_A = +25°C
60V	2Ω @ V_{GS} = 10V	540mA
	3Ω @ V_{GS} = 5V	430mA

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate to 2kV
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**

Description and Applications

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications.

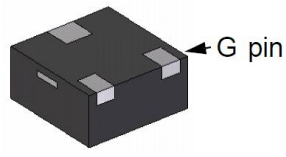
- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Load Switch

Mechanical Data

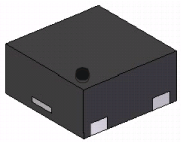
- Case: X1-DFN1212-3
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e4
- Terminal Connections: See Diagram
- Weight: 0.005 grams (Approximate)



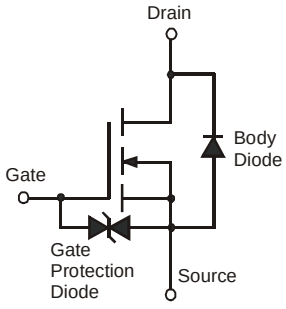
ESD PROTECTED TO 2kV



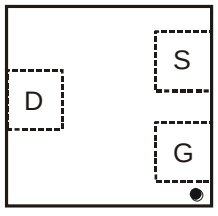
Top View



Bottom View



Equivalent Circuit



Top View
Pin-Out

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN62D0SFD-7	X1-DFN1212-3	3000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

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Marking Information

Site 1:



K62 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: I = 2021)
M = Month (ex: 9 = September)

Date Code Key

Year	2011	…	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	Y	…	I	J	K	L	M	N	O	P	R	S

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Site 2:



K62 = Product Type Marking Code
YWX = Date Code Marking
Y = Year (ex:1 = 2021)
W = Week (ex: a = Week 27; z Represents Week 52 and 53)
X = Internal Code (ex: U = Monday)

Date Code Key

Year	2011	…	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	1	…	1	2	3	4	5	6	7	8	9	0

Week	1-26	27-52	53
Code	A-Z	a-z	z

Internal Code	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Code	T	U	V	W	X	Y	Z

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	540 430	mA
	t < 10s	T_A = +25°C T_A = +70°C	I_D	630 500	mA
Continuous Drain Current (Note 6) V_{GS} = 5V	Steady State	T_A = +25°C T_A = +70°C	I_D	430 340	mA
	t < 10s	T_A = +25°C T_A = +70°C	I_D	510 410	mA
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	1.0	A
Maximum Body Diode Forward Current (Note 6)			I_S	540	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P_D	0.43	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	260	°C/W
	t < 10s		182	°C/W
Total Power Dissipation (Note 6)		P_D	0.89	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	140	°C/W
	t < 10s		98	°C/W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	112	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	V_{GS} = 0V, I_D = 10µA
Zero Gate Voltage Drain Current @ T_J = +25°C	I_{DSS}	—	—	100	nA	V_{DS} = 60V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	10	µA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1.0	1.6	2.5	V	V_{DS} = 10V, I_D = 1mA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	—	2	Ω	V_{GS} = 10V, I_D = 500mA
		—	—	3		V_{GS} = 5V, I_D = 50mA
Forward Transfer Admittance	$\|Y_{fs}\|$	—	130	—	mS	V_{DS} = 3V, I_D = 30mA
Diode Forward Voltage	V_{SD}	—	0.8	1.2	V	V_{GS} = 0V, I_S = 300mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	30.2	—	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	4.4	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	2.8	—	pF	
Gate Resistance	R_g	—	131	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	0.39	—	nC	V_{DS} = 10V, I_D = 1A
Total Gate Charge (V_{GS} = 10.0V)	Q_g	—	0.87	—	nC	
Gate-Source Charge	Q_{gs}	—	0.14	—	nC	
Gate-Drain Charge	Q_{gd}	—	0.09	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	3.95	—	ns	V_{DS} = 30V, I_D = 200mA V_{GS} = 10V, R_G = 25Ω
Turn-On Rise Time	t_R	—	3.81	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	16.0	—	ns	
Turn-Off Fall Time	t_F	—	9.04	—	ns	

Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

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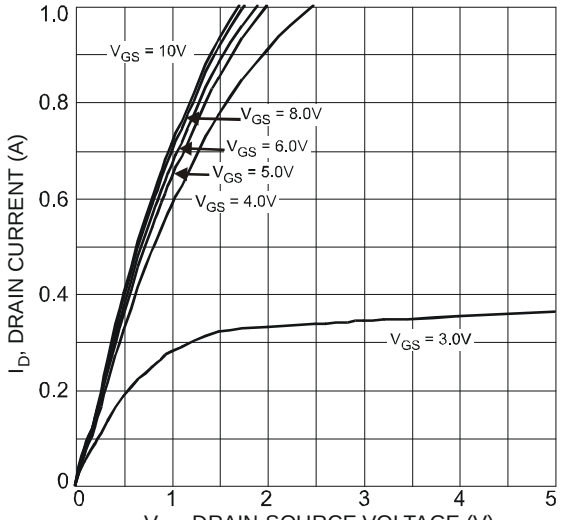

Fig.1 Typical Output Characteristic

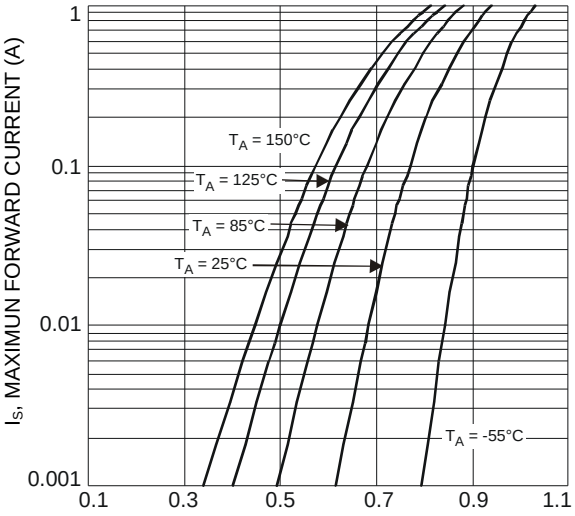

Fig. 2 Maximum Forward Current vs. Source-Drain Voltage

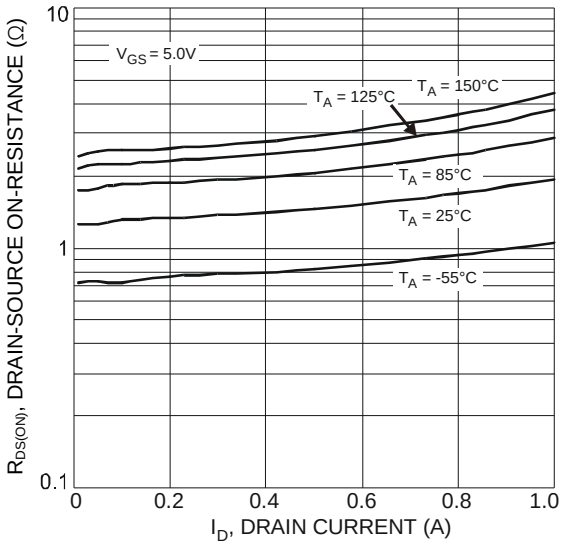

Fig. 3 Typical On-Resistance vs. Drain Current and Temperature

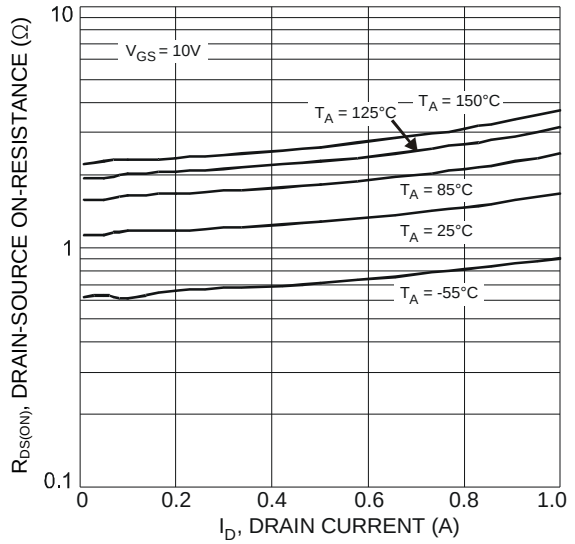

Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

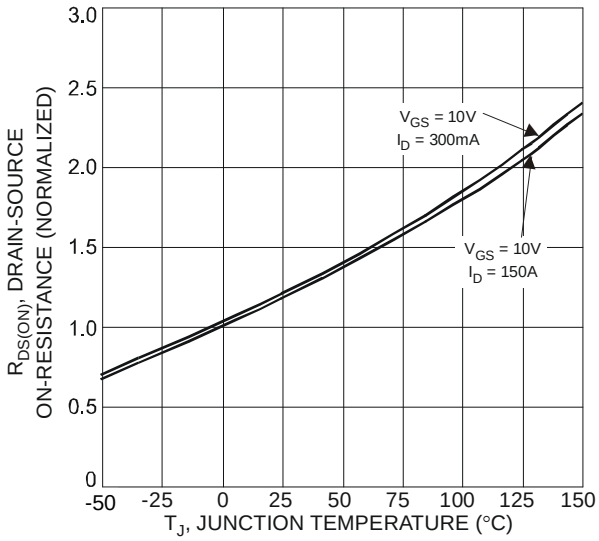

Fig. 5 On-Resistance Variation with Temperature

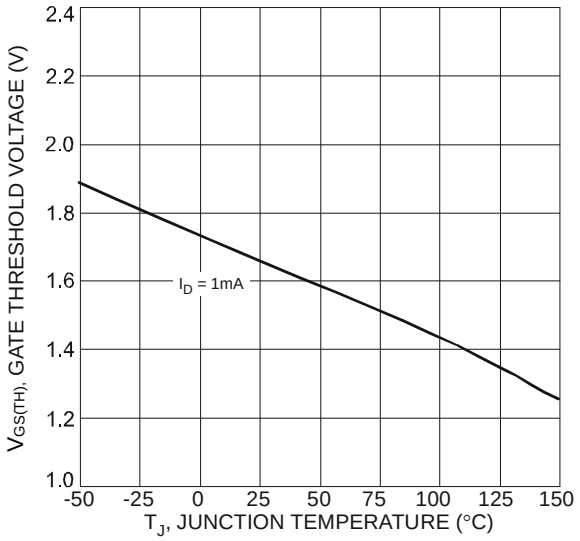

Fig. 6 Gate Threshold Variation vs. Junction Temperature

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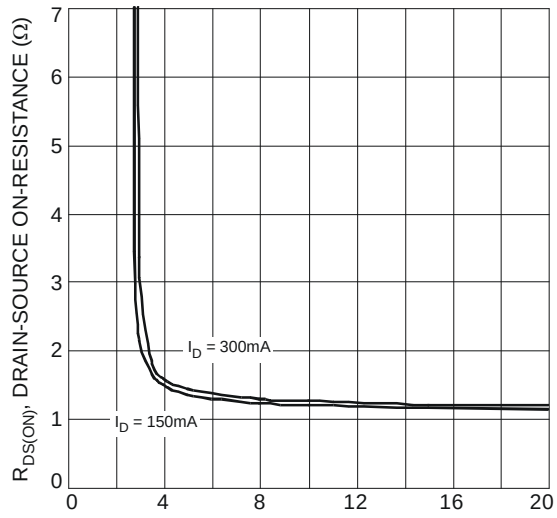

Fig. 7 Typical Transfer Characteristics

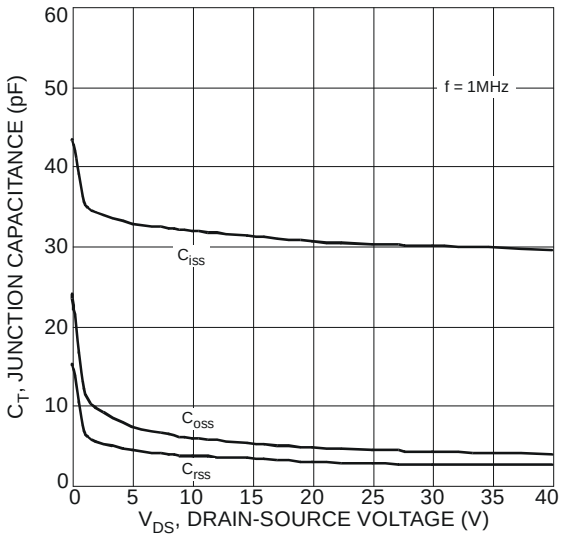

Fig. 8 Typical Junction Capacitance

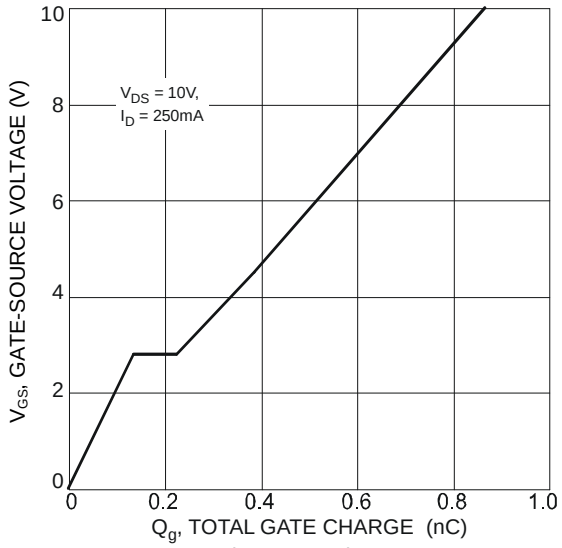

Fig. 9 Gate Charge

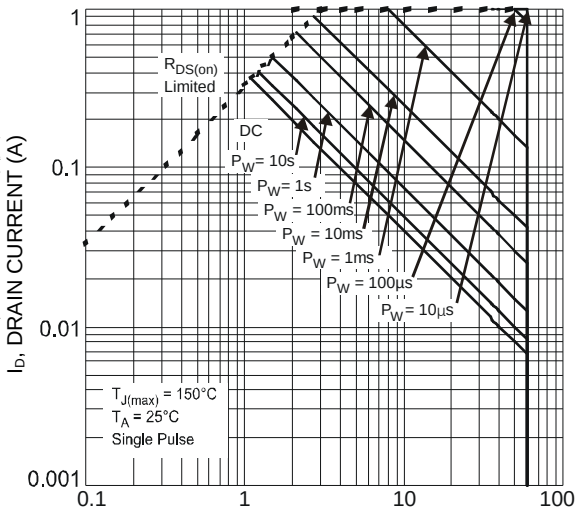

Fig. 10 SOA, Safe Operation Area

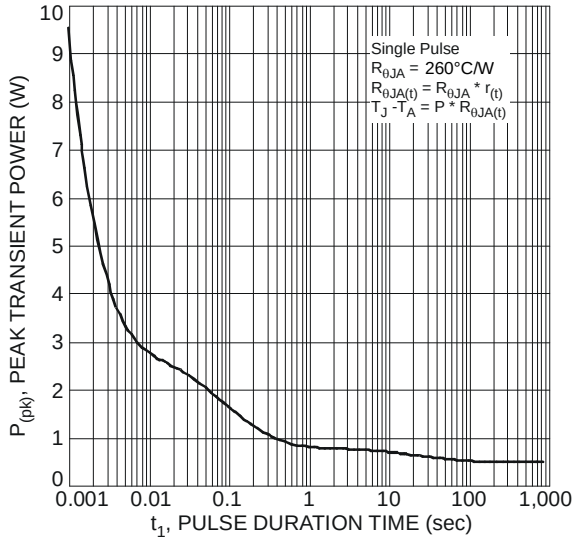

Fig. 11 Single Pulse Maximum Power Dissipation

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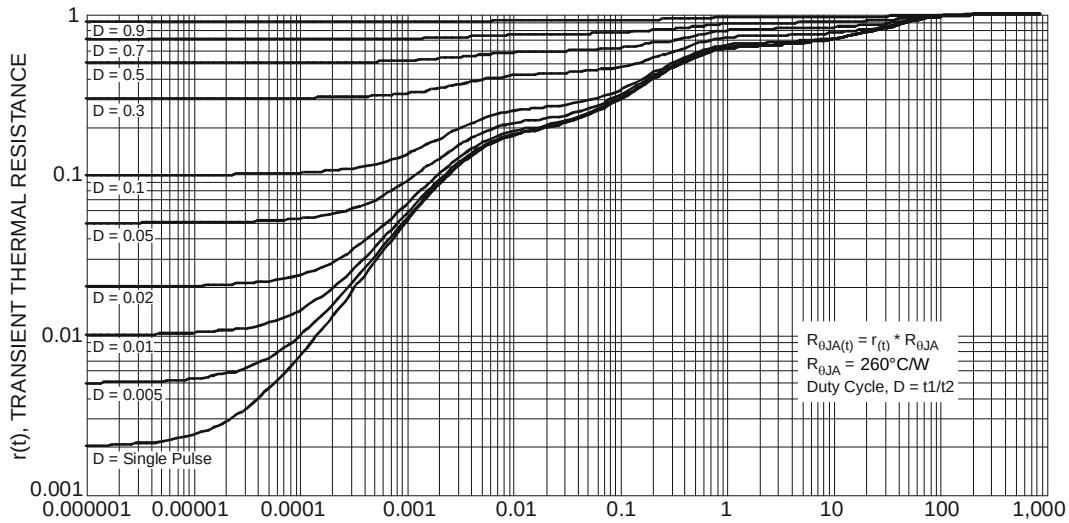

Fig. 12 Transient Thermal Resistance

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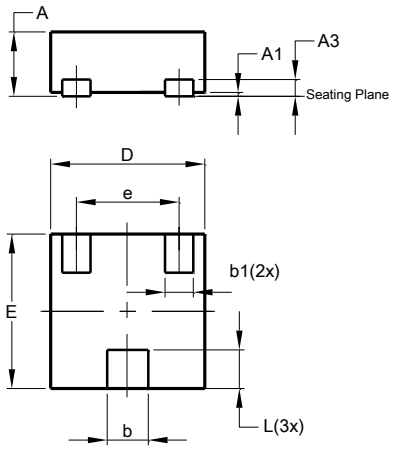
Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

X1-DFN1212-3

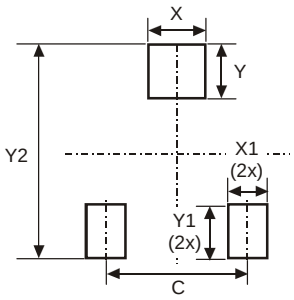


X1-DFN1212-3			
Dim	**Min**	**Max**	**Typ**
A	0.47	0.53	0.50
A1	0	0.05	0.02
A3	-	-	0.13
b	0.27	0.37	0.32
b1	0.17	0.27	0.22
D	1.15	1.25	1.20
E	1.15	1.25	1.20
e	-	-	0.80
L	0.25	0.35	0.30
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

X1-DFN1212-3



Dimensions	Value (in mm)
C	0.80
X	0.42
X1	0.32
Y	0.50
Y1	0.50
Y2	1.50

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