

# MOSFET – Power, N-Channel, Dual EFCP

24 V, 5 A, 46.2 mΩ

## EFC4626R

### Features

- 2.5 V Drive
- Protection Diode In
- Common-Drain Type
- 2 kV ESD HBM
- This Device is Pb-Free, Halogen Free/BFR Free and is RoHS Compliant

### Applications

- Lithium-ion Battery Charging and Discharging Switch

### Specifications

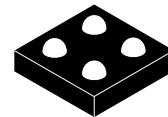
#### ABSOLUTE MAXIMUM RATINGS (TA = 25°C)

Parameter	Symbol	Conditions	Value	Unit
Source to Source Voltage	V <sub>SSS</sub>		24	V
Gate to Source Voltage	V <sub>GSS</sub>		±10	V
Source Current (DC)	I <sub>S</sub>		5	A
Source Current (Pulse)	I <sub>SP</sub>	PW ≤ 10 μs, duty cycle ≤ 1%	60	A
Total Dissipation	P <sub>T</sub>	When mounted on ceramic substrate (5000 mm <sup>2</sup> x 0.8 mm)	1.4	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		- 55 to +150	°C

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.

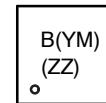
#### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Value	Unit
Junction to Ambient When mounted on ceramic substrate (5000 mm <sup>2</sup> x 0.8 mm)	R <sub>θJA</sub>	84	V



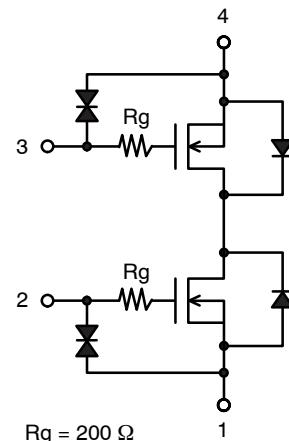
CSP4 1.01x1.01  
CASE 568AK

#### MARKING DIAGRAM



B = Specific Device Code  
Y = Year of Production  
M = Assembly Operation Month  
ZZ = Assembly Lot Number

#### ELECTRICAL CONNECTION



#### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
EFC4626R-TR	CSP4 (Pb-Free and Halogen Free)	8000 / Tape & Reel

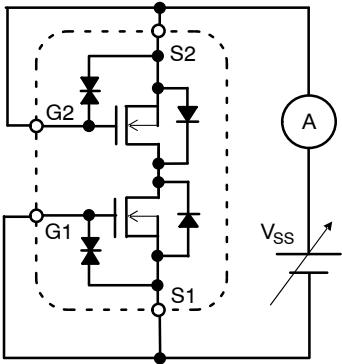
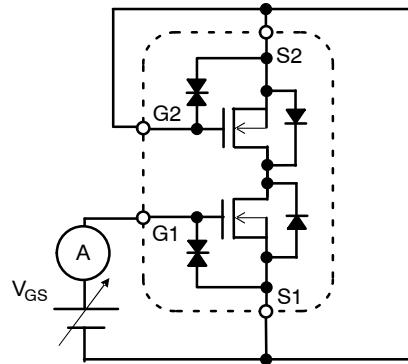
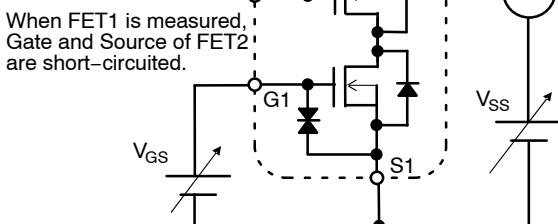
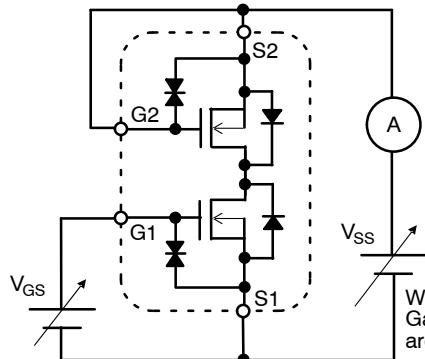
<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

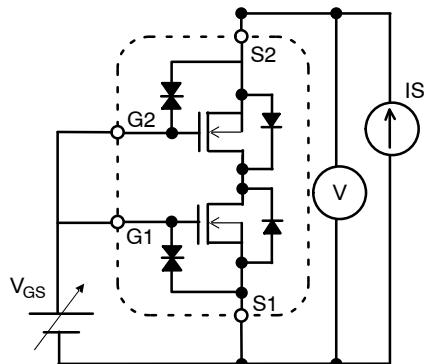
Parameter	Symbol	Conditions	Min	Typ	Max	Unit	
Source to Source Breakdown Voltage	$V_{(\text{BR})\text{SSS}}$	$I_S = 1 \text{ mA}, V_{GS} = 0 \text{ V}$	24	—	—	V	
Zero-Gate Voltage Source Current	$I_{\text{SSS}}$	$V_{SS} = 20 \text{ V}, V_{GS} = 0 \text{ V}$	Test Circuit 1	—	—	1 $\mu\text{A}$	
Gate to Source Leakage Current	$I_{\text{GSS}}$	$V_{GS} = \pm 8 \text{ V}, V_{SS} = 0 \text{ V}$	Test Circuit 2	—	—	$\pm 1 \mu\text{A}$	
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{SS} = 10 \text{ V}, I_S = 1 \text{ mA}$	Test Circuit 3	0.5	—	1.3	V
Forward Transconductance	$g_{\text{FS}}$	$V_{SS} = 10 \text{ V}, I_S = 2 \text{ A}$	Test Circuit 4	—	7	—	S
Static Source to Source On-State Resistance	$R_{\text{SS}(\text{on})1}$	$I_S = 2 \text{ A}, V_{GS} = 4.5 \text{ V}$	Test Circuit 5	29.2	37.5	46.2	$\text{m}\Omega$
	$R_{\text{SS}(\text{on})2}$	$I_S = 2 \text{ A}, V_{GS} = 4.0 \text{ V}$	Test Circuit 5	30.8	39.5	48.6	$\text{m}\Omega$
	$R_{\text{SS}(\text{on})3}$	$I_S = 2 \text{ A}, V_{GS} = 3.8 \text{ V}$	Test Circuit 5	32.0	41.0	50.5	$\text{m}\Omega$
	$R_{\text{SS}(\text{on})4}$	$I_S = 2 \text{ A}, V_{GS} = 3.1 \text{ V}$	Test Circuit 5	35.5	45.5	58.3	$\text{m}\Omega$
	$R_{\text{SS}(\text{on})5}$	$I_S = 2 \text{ A}, V_{GS} = 2.5 \text{ V}$	Test Circuit 5	42.6	54.0	72.4	$\text{m}\Omega$
Turn-On Delay Time	$t_{\text{d}(\text{on})}$	$V_{SS} = 10 \text{ V}, V_{GS} = 4.5 \text{ V}, I_S = 2 \text{ A}$	Test Circuit 6	—	20	—	ns
Rise Time	$t_r$			—	350	—	ns
Turn-Off Delay Time	$t_{\text{d}(\text{off})}$			—	22000	—	ns
Fall Time	$t_f$			—	38400	—	ns
Total Gate Charge	$Q_g$	$V_{SS} = 10 \text{ V}, V_{GS} = 4.5 \text{ V}, I_S = 5 \text{ A}$	Test Circuit 7	—	7.5	—	nC
Forward Source to Source Voltage	$V_{F(\text{S-S})}$	$I_S = 2 \text{ A}, V_{GS} = 0 \text{ V}$	Test Circuit 8	—	0.81	1.2	V

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.

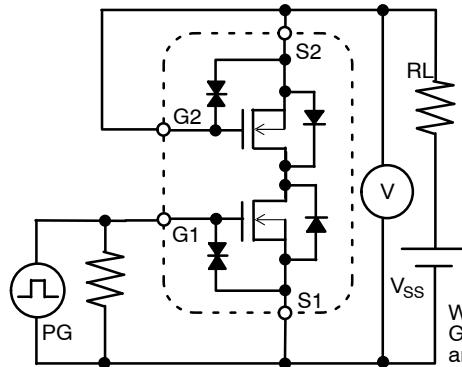
## Test Circuits are Example of Measuring FET1 Side.

Figure 1. Test Circuit 1 –  $I_{\text{SSS}}$ Figure 2. Test Circuit 2 –  $I_{\text{GSS}}$ Figure 3. Test Circuit 3 –  $V_{GS(\text{th})}$ Figure 4. Test Circuit 4 –  $g_{\text{FS}}$

## TEST CIRCUITS (continued)



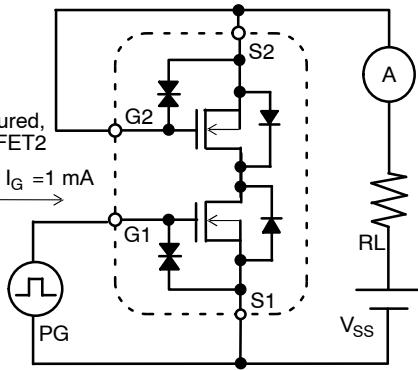
**Figure 5. Test Circuit 5 –  $R_{SS(on)}$**



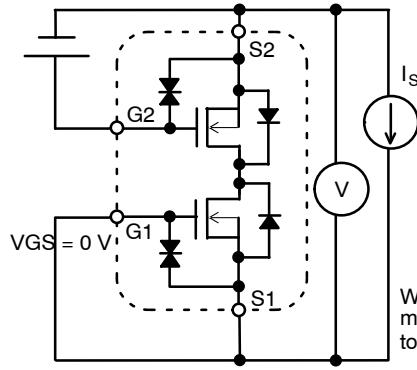
**Figure 6. Test Circuit 6 –  $t_d(\text{on})$ ,  $t_r$ ,  $t_d(\text{off})$ ,  $t_f$**

When FET1 is measured,  
Gate and Source of FET2  
are short-circuited.

When FET1 is measured,  
Gate and Source of FET2  
are short-circuited.



**Figure 7. Test Circuit 7 – Qg**

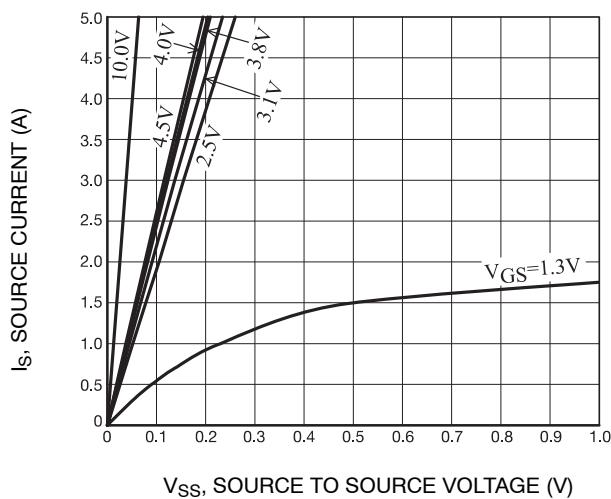
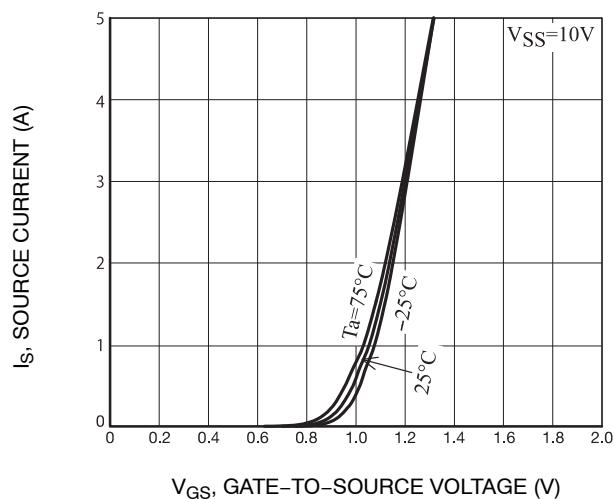
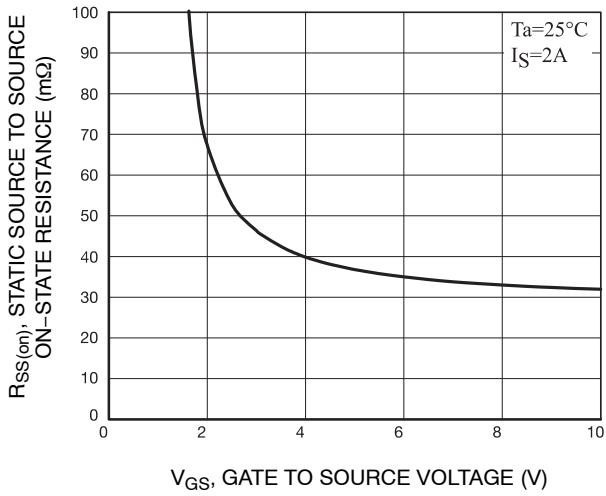
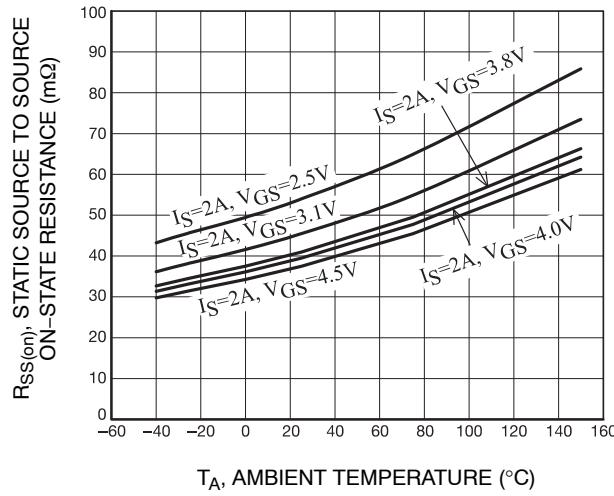
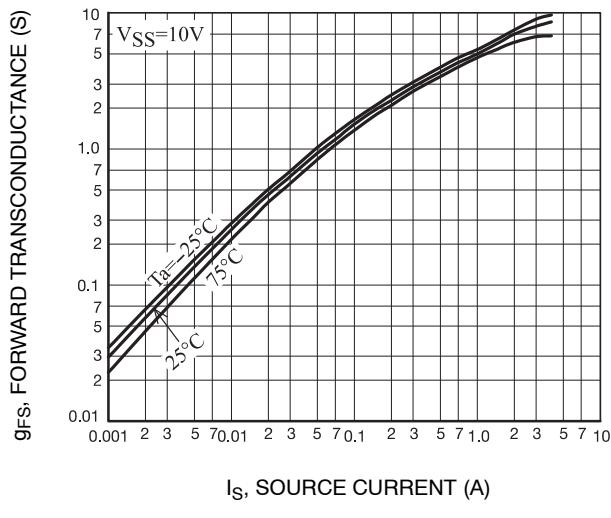
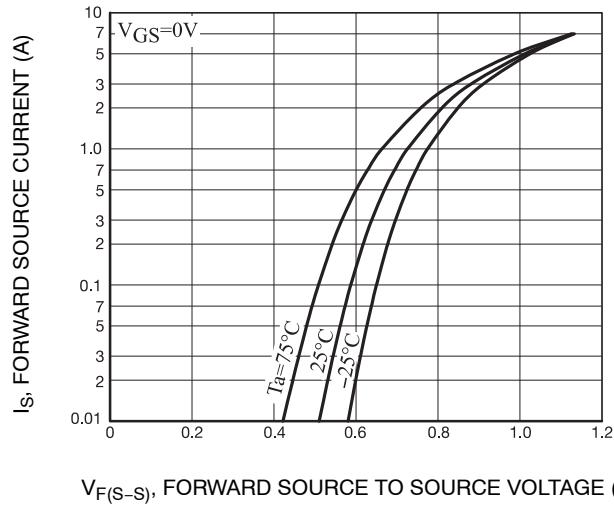


**Figure 8. Test Circuit 8 –  $V_{F(S-S)}$**

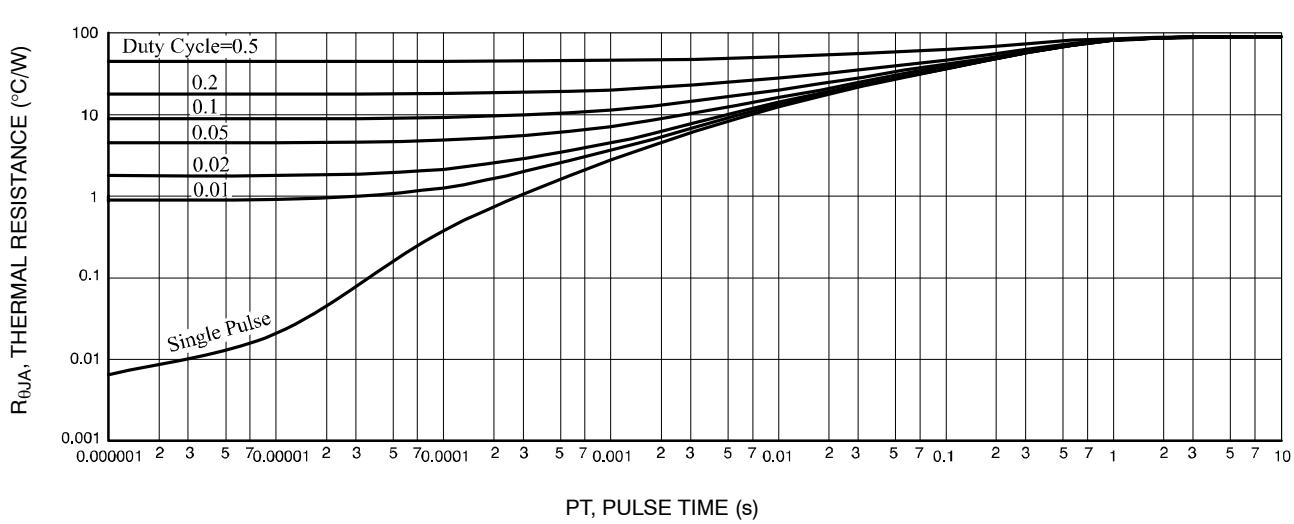
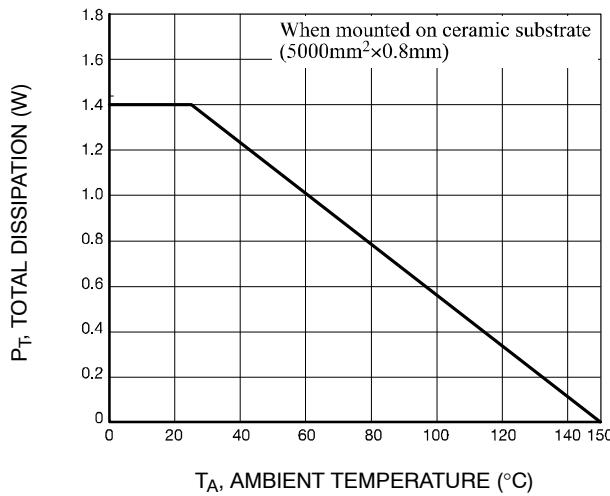
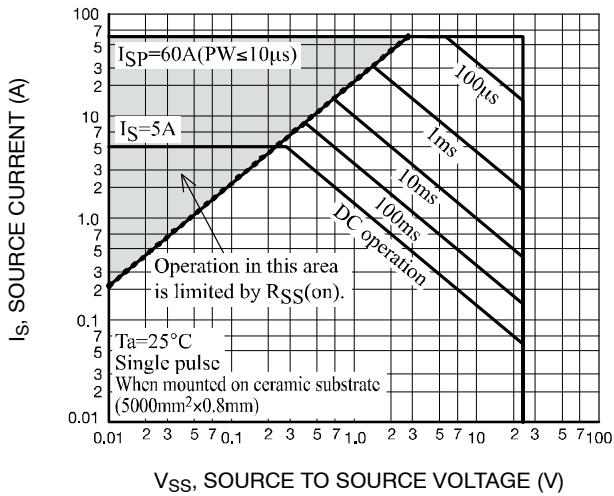
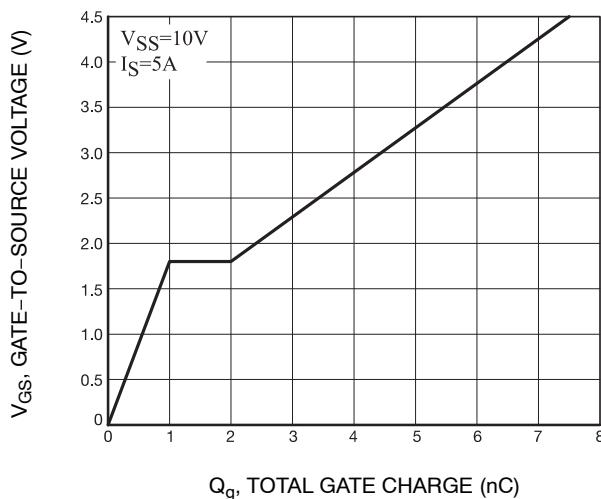
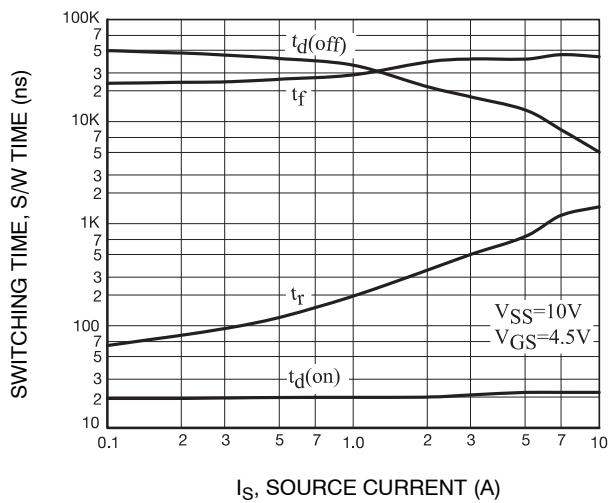
When FET1 is measured, +4.5 V is added to  $V_{GS}$  of FET2.

NOTE: When FET2 is measured, the position of FET1 and FET2 is switched.

## TYPICAL CHARACTERISTICS

V<sub>SS</sub>, SOURCE TO SOURCE VOLTAGE (V)Figure 9. I<sub>S</sub> – V<sub>SS</sub>V<sub>GS</sub>, GATE-TO-SOURCE VOLTAGE (V)Figure 10. I<sub>S</sub> – V<sub>GS(th)</sub>V<sub>GS</sub>, GATE TO SOURCE VOLTAGE (V)Figure 11. R<sub>SS(on)</sub> – V<sub>GS</sub>T<sub>A</sub>, AMBIENT TEMPERATURE (°C)Figure 12. R<sub>SS(on)</sub> – T<sub>A</sub>I<sub>S</sub>, SOURCE CURRENT (A)Figure 13. g<sub>Fs</sub> – I<sub>S</sub>V<sub>F(S-S)</sub>, FORWARD SOURCE TO SOURCE VOLTAGE (V)Figure 14. I<sub>S</sub> – V<sub>F(S-S)</sub>

**TYPICAL CHARACTERISTICS (continued)**



# EFC4626R

## PACKAGE DIMENSION

EFC4626R-TR

(Unit: mm)

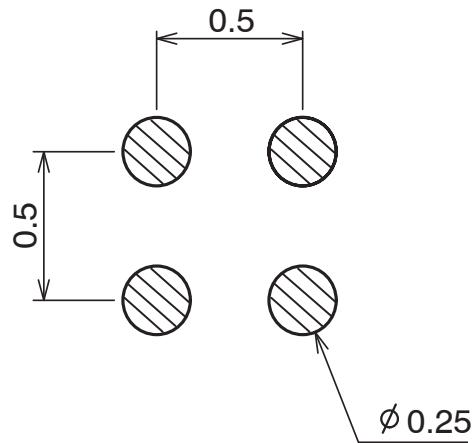
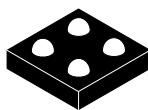
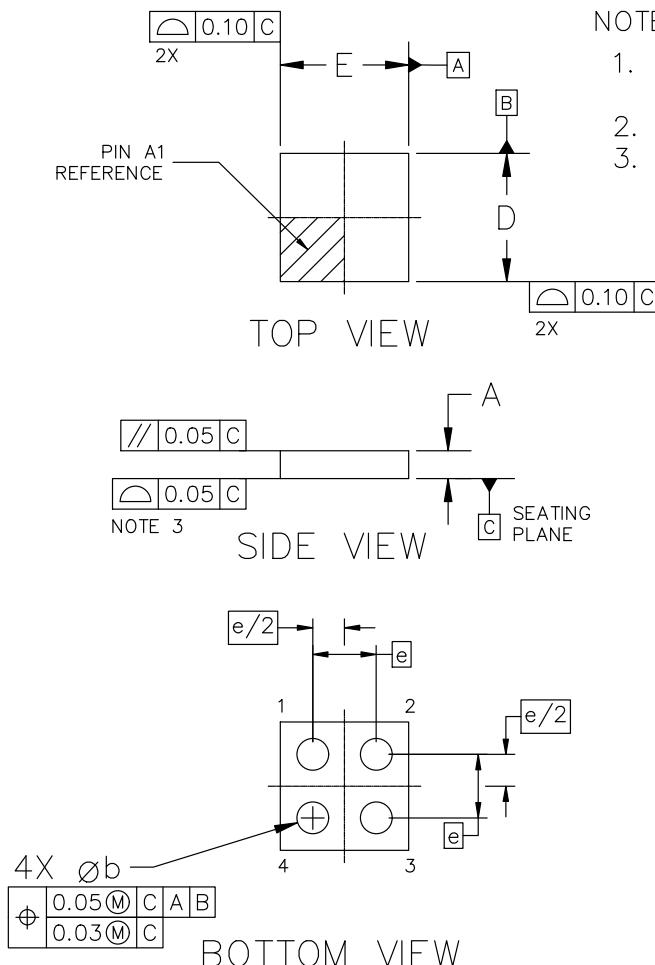


Figure 20. Recommended Soldering Footprint

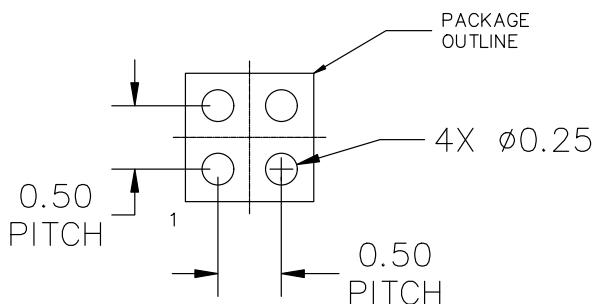
Note on usage: Since the EFC4626R is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.


**WLCSP4, 1.01x1.01x0.20, 0.50P**  
CASE 568AK  
ISSUE C

DATE 05 NOV 2024



MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.18	0.20	0.22
b	0.22	0.25	0.28
D	0.99	1.01	1.11
E	0.99	1.01	1.11
e	0.50 BSC		


**RECOMMENDED  
MOUNTING FOOTPRINT**

\*For additional information on our Pb-Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques References manual, SOLDERRM/D.

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DESCRIPTION:	WLCSP4, 1.01x1.01x0.20, 0.50P	PAGE 1 OF 1

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