

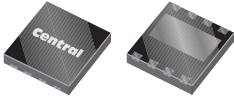
CDFG6558N

**SURFACE MOUNT GaN  
N-CHANNEL  
POWER FET**

**29 AMP, 650 VOLT**



[www.centrasemi.com](http://www.centrasemi.com)



Top View Bottom View

**DFN8X8 CASE**

**DESCRIPTION:**

The CENTRAL SEMICONDUCTOR CDFG6558N is a 650 Volt N-Channel GaN FET designed for high voltage, soft switching applications. This GaN FET combines high voltage capability with low  $r_{DS(ON)}$  and low gate charge for optimal efficiency.

**MARKING: C6558 8X8 L/C D/C**

**APPLICATIONS:**

- Switch-mode power supplies
- High power chargers
- Electric vehicle inverters

**FEATURES:**

- High voltage capability
- Low gate charge &  $r_{DS(ON)}$
- Fast switching

**MAXIMUM RATINGS:** ( $T_J=25^\circ\text{C}$  unless otherwise noted)

	SYMBOL		UNITS
Drain-Source Voltage	$V_{DS}$	650	V
Gate-Source Voltage	$V_{GS}$	-6.0 to +7.0	V
Continuous Drain Current ( $T_C=25^\circ\text{C}$ )	$I_D$	29	A
Pulsed Drain Current ( $T_C=25^\circ\text{C}$ )	$I_{DM}$	58	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	188	W
Power Dissipation ( $T_A=25^\circ\text{C}$ )	$P_D$	1.1	W
Operating and Storage Junction Temperature	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS:** ( $T_J=25^\circ\text{C}$  unless otherwise noted)

SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
$I_{GSSF}$	$V_{GS}=6.0\text{V}, V_{DS}=0$		163		$\mu\text{A}$
$I_{GSSR}$	$V_{GS}=1.0\text{V}, V_{DS}=0$		163		$\mu\text{A}$
$I_{DSS}$	$V_{DS}=650\text{V}, V_{GS}=0$		5	65	$\mu\text{A}$
$V_{gs(th)}$	$V_{GS}=V_{DS}, I_D=30.7\text{mA}$	1.2	1.7	2.5	V
$V_{SD}$	$V_{GS}=0, I_S=8.0\text{A}$		2.3		V
$r_{DS(ON)}$	$V_{GS}=6.0\text{V}, I_D=8.0\text{A}$		60	80	$\text{m}\Omega$
$R_G$	$f=5\text{MHz}$ ; open drain		3		$\Omega$
$C_{iss}$	$V_{DS}=400\text{V}, V_{GS}=0, f=100\text{kHz}$		225		pF
$C_{oss}$	$V_{DS}=400\text{V}, V_{GS}=0, f=100\text{kHz}$		70		pF
$C_{rss}$	$V_{DS}=400\text{V}, V_{GS}=0, f=100\text{kHz}$		0.5		pF
$C_{o(er)}$	$V_{DS}=0$ to 400V, $V_{GS}=0$		105		pF
$C_{o(tr)}$	$V_{DS}=0$ to 400V, $V_{GS}=0$		150		pF
$Q_{oss}$	$V_{DS}=0$ to 400V, $V_{GS}=0$		60		nC
$Q_g$	$V_{DS}=400\text{V}, V_{GS}=0\text{V}$ to 6V, $I_D=8\text{A}$		6.2		nC
$Q_{gs}$	$V_{DS}=400\text{V}, V_{GS}=0\text{V}$ to 6V, $I_D=8\text{A}$		0.5		nC
$Q_{gd}$	$V_{DS}=400\text{V}, V_{GS}=0\text{V}$ to 6V, $I_D=8\text{A}$		2.2		nC

R1 (9-May 2024)

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**SURFACE MOUNT GaN  
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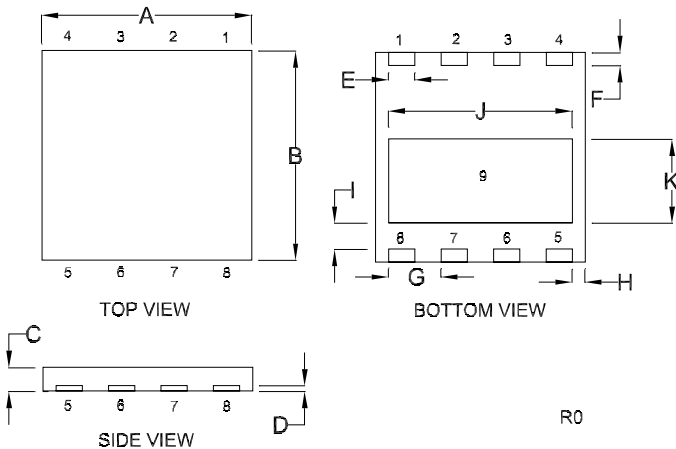
**58 AMP, 650 VOLT**



**ELECTRICAL CHARACTERISTICS - Continued:** ( $T_J=25^{\circ}\text{C}$  unless otherwise noted)

SYMBOL	TEST CONDITIONS	TYP	UNITS
$t_{d(on)}$	$V_{DS}=400\text{V}$ , $V_{GS}=6.0\text{V}$ , $R_{G(OFF)}=2\Omega$ $R_{G(on)}=10\Omega$ , $L=318\mu\text{H}$ , $I_D=16\text{A}$	3.0	ns
$t_{d(off)}$	$V_{DS}=400\text{V}$ , $V_{GS}=6.0\text{V}$ , $R_{G(OFF)}=2\Omega$ $R_{G(on)}=10\Omega$ , $L=318\mu\text{H}$ , $I_D=16\text{A}$	5.0	ns
$t_r$	$V_{DS}=400\text{V}$ , $V_{GS}=6.0\text{V}$ , $R_{G(OFF)}=2\Omega$ $R_{G(on)}=10\Omega$ , $L=318\mu\text{H}$ , $I_D=16\text{A}$	4.0	ns
$t_f$	$V_{DS}=400\text{V}$ , $V_{GS}=6.0\text{V}$ , $R_{G(OFF)}=2\Omega$ $R_{G(on)}=10\Omega$ , $L=318\mu\text{H}$ , $I_D=16\text{A}$	4.0	ns

**DFN8X8 CASE - MECHANICAL OUTLINE**



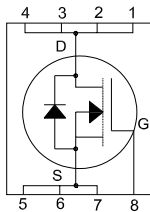
SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.307	0.323	7.80	8.20
B	0.307	0.323	7.80	8.20
C	0.031	0.039	0.80	1.00
D	0.006	0.010	0.15	0.25
E	0.037	0.041	0.95	1.05
F	0.018	0.022	0.45	0.55
G	0.071	0.087	1.80	2.20
H	0.018	0.022	0.45	0.55
I	0.037	0.041	0.95	1.05
J	0.268	0.283	6.80	7.20
K	0.120	0.132	3.05	3.35

DFN8X8 (REV: R0)

**LEAD CODE:**

- 1) Drain      5) Source
- 2) Drain      6) Source
- 3) Drain      7) Kelvin Source
- 4) Drain      8) Gate
- 9) Source

Pins 5, 6, 7 are common to the pad (pin 9)



**MARKING: C6558 8X8 L/C D/C**

## OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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### PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

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### DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2<sup>nd</sup> day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

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### REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix "TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix "PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

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### CONTACT US

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