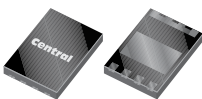


**CDF56G6517N**

**SURFACE MOUNT GaN  
N-CHANNEL  
POWER FET  
17 AMP, 650 VOLT**



Top View Bottom View

**DFN5X6A CASE**

**Central**  
Semiconductor

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

The CENTRAL SEMICONDUCTOR CDF56G6517N 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: C6517 5X6 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	$V_{GS}$	-1.4 to +7.0	V
Continuous Drain Current ( $T_C=25^\circ\text{C}$ )	$I_D$	17	A
Pulsed Drain Current ( $T_C=25^\circ\text{C}$ )	$I_{DM}$	32	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	113	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
$I_{GSSF}$	$V_{GS}=6.0\text{V}, V_{DS}=0$		70		$\mu\text{A}$
$I_{GSSR}$	$V_{GS}=1.0\text{V}, V_{DS}=0$		70		$\mu\text{A}$
$I_{DSS}$	$V_{DS}=650\text{V}, V_{GS}=0$		0.6	25	$\mu\text{A}$
$BV_{DSS}$	$V_{GS}=0, I_D=250\mu\text{A}$	650			V
$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=17.2\text{mA}$	1.2	1.7	2.5	V
$V_{SD}$	$V_{GS}=0, I_S=5.0\text{A}$		2.4		V
$r_{DS(ON)}$	$V_{GS}=6.0\text{V}, I_D=5.0\text{A}$		106	140	$\text{m}\Omega$
$C_{iss}$	$V_{DS}=400\text{V}, V_{GS}=0, f=100\text{kHz}$		125		$\text{pF}$
$C_{oss}$	$V_{DS}=400\text{V}, V_{GS}=0, f=100\text{kHz}$		41		$\text{pF}$
$C_{rss}$	$V_{DS}=400\text{V}, V_{GS}=0, f=100\text{kHz}$		0.4		$\text{pF}$
$C_{oss(er)}$	$V_{DS}=0$ to 400V, $V_{GS}=0$		59		$\text{pF}$
$C_{oss(tr)}$	$V_{DS}=0$ to 400V, $V_{GS}=0$		82		$\text{pF}$
$Q_g(\text{tot})$	$V_{DS}=400\text{V}, V_{GS}=0$ to 6.0V, $I_D=5.0\text{A}$		3.5		nC
$Q_{gd}$	$V_{DS}=400\text{V}, V_{GS}=0$ to 6.0V, $I_D=5.0\text{A}$		1.2		nC
$Q_{gs}$	$V_{DS}=400\text{V}, V_{GS}=0$ to 6.0V, $I_D=5.0\text{A}$		0.3		nC

R2 (1-November 2023)

CDF56G6517N

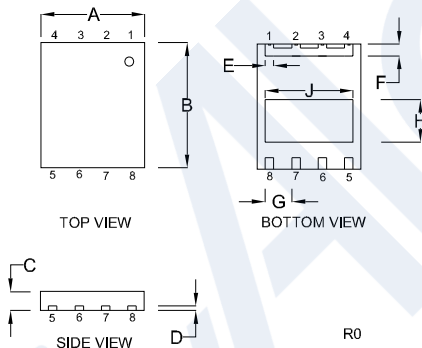
**SURFACE MOUNT GaN  
N-CHANNEL  
POWER FET  
17 AMP, 650 VOLT**



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

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

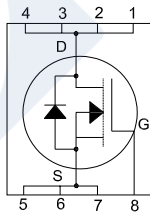
**DFN5X6A CASE - MECHANICAL OUTLINE**



SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.197		5.00	
B	0.236		6.00	
C	0.031	0.039	0.80	1.00
D	0.008		0.20	
E	0.012	0.020	0.30	0.50
F	0.018	0.030	0.45	0.75
G	0.050		1.27	
H	0.077	0.085	1.95	2.15
J	0.164	0.175	4.16	4.45

DFN5X6A (REV: R0)

**PIN CONFIGURATION**



**LEAD CODE:**

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

Pins 5, 6, 7 are common to the pad

**MARKING: C6517 5X6 L/C D/C**

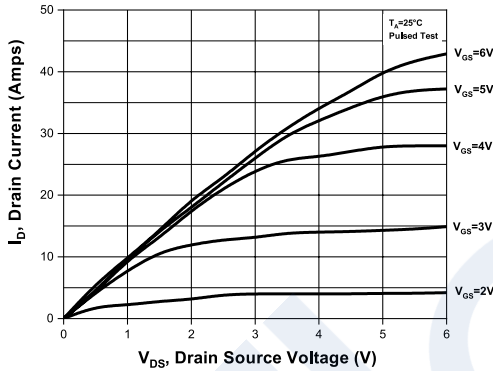
CDF56G6517N

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POWER FET  
17 AMP, 650 VOLT

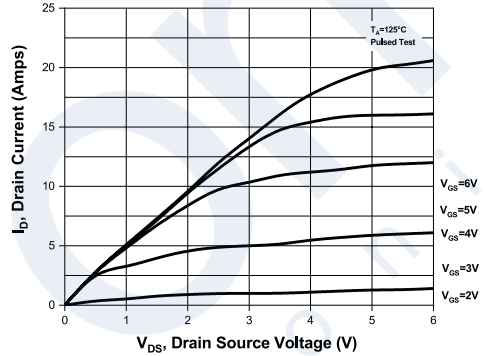


### TYPICAL ELECTRICAL CHARACTERISTICS

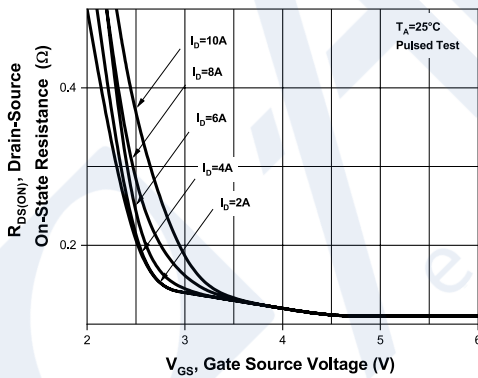
Typical Output Characteristics



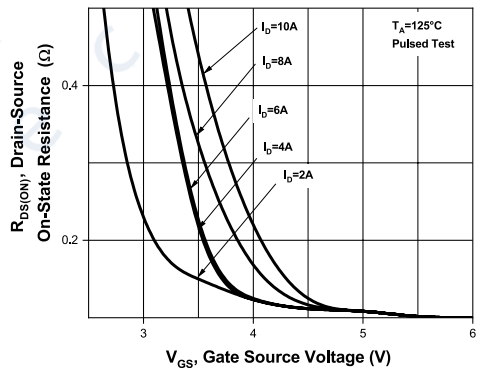
Typical Output Characteristics



Drain Source On Resistance



Drain Source On Resistance



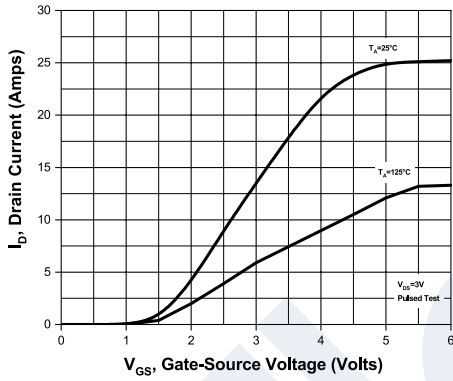
CDF56G6517N

SURFACE MOUNT GaN  
N-CHANNEL  
POWER FET  
17 AMP, 650 VOLT

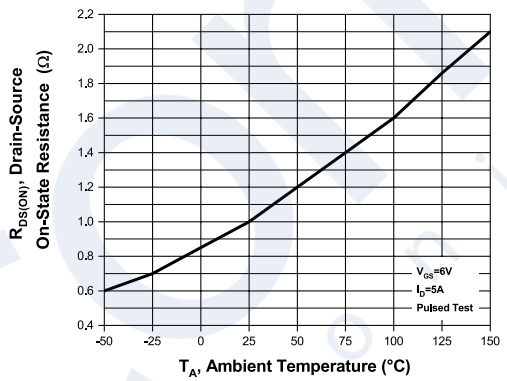


### TYPICAL ELECTRICAL CHARACTERISTICS

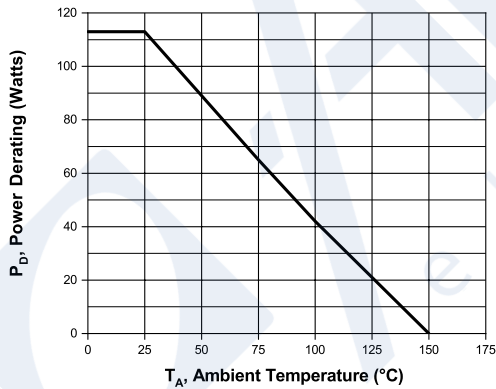
Transfer Characteristics



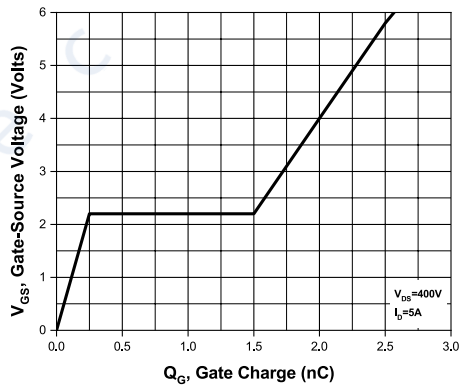
Drain-Source Temperature Coefficient



Power Derating



Gate Capacitance Charge

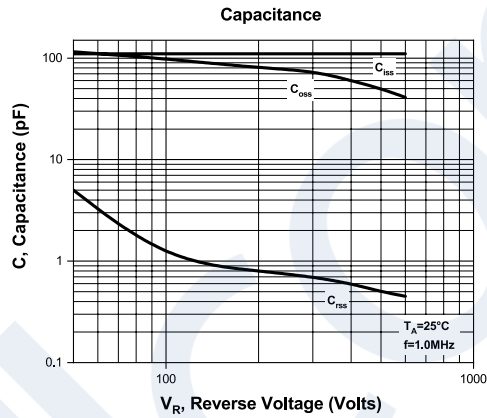


CDF56G6517N

SURFACE MOUNT GaN  
N-CHANNEL  
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### TYPICAL ELECTRICAL CHARACTERISTICS



## 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

#### Corporate Headquarters & Customer Support Team

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