CE65H080TADC

CoreGaN 650V GaN HEMT

Description

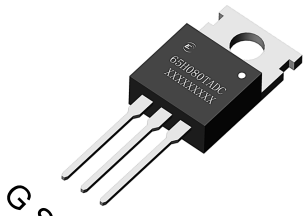
The CE65H080TADC Series 650V, 80mΩ gallium nitride (GaN) FETs are normally-off devices.

Corenergy GaN FETs offer better efficiency through lower gate charge, faster switching speeds, and lower dynamic on-resistance, delivering significant advantages over traditional silicon (Si) devices.

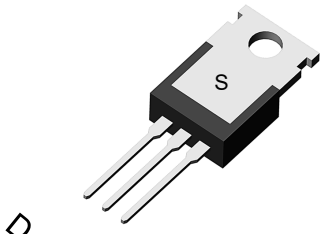
Corenergy is a leading-edge wide band gap supplier with world-class innovation .

Ordering Information

Part Number	Package	Package Configuration
CE65H080TADC	TO220	Source



Top



Bottom

Application

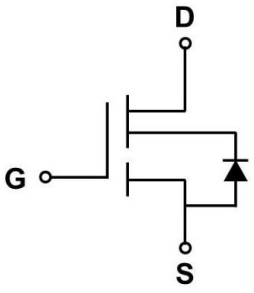
- Adapter
- Renewable energy
- Telecom and data-com
- Servo motors
- Industrial
- Automotive

General Features

Easy to drive—compatible with standard gate drivers

Low conduction and switching losses

RoHS compliant and Halogen-free



Circuit Symbol

Benefits

Increased efficiency through fast switching

Increased power density

Reduced system size and weight

Features

BV_{DSS}	R_{DSON}	I_{DS}	Q_G
650V	80mΩ	24A	10.4nC

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Absolute Maximum Ratings

T_c=25°C unless otherwise stated

Symbol	Parameter		Limit value	Unit
V_{DSS}	Drain to source voltage (T_J = -55°C to 150°C)		650	V
$V_{(TR)DSS}$	Drain to source voltage-transient [a]		800	
V_{GSS}	Gate to source voltage		-20~+20	
I_D	Continuous drain current @T_C=25°C [b]		24	A
	Continuous drain current @T_C=125°C [b]		11	
I_{DM}	Pulse drain current (pulse width: 10μs)		66	A
P_D	Maximum power dissipation @ T_C=25°C		137	W
T_C	Operating temperature	Case	-55~150	°C
T_J		Junction	-55~150	°C
T_S	Storage temperature		-55~150	°C

a. In off-state, spike duty cycle D<0.01, spike duration <1μs

b. For increased stability at high current operation

Thermal Resistance

Symbol	Parameter	Limit value	Unit
$R_{\theta JC}$	Junction-to-case	0.91	°C /W

CE65H080TADC

Electrical Parameters

T_j=25°C unless otherwise stated

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
Forward Device Characteristics						
$V_{(BL)DSS}$	Drain-source voltage	650	-	-	V	V_{GS}= 0V
$V_{GS(th)}$	Gate threshold voltage	3	4	5	V	V_{DS}=1V, I_{DS}=1mA, T_J=25°C
$\triangle V_{GS(th)}/T_J$	Gate threshold voltage temperature coefficient	-	-7	-	mV/°C	
$R_{DS(on)}$	Drain-source on-Resistance	-	80	110	mΩ	V_{GS}=10V, I_D= 15A, T_J=25°C
		-	180	-		V_{GS}=10V, I_D= 15A, T_J=150°C
I_{DSS}	Drain-to-source leakage current	-	6	12	μA	V_{DS}=650V, V_{GS}= 0V, T_J=25°C
		-	10	100		V_{DS}=650V, V_{GS}= 0V, T_J=150°C
I_{GSS}	Gate-to-source forward leakage current	-	-	±100	nA	V_{GS}=±20V
C_{ISS}	Input capacitance	-	807	-	pF	V_{GS}=0V, V_{DS}=400V, f=1MHz
C_{OSS}	Output capacitance	-	55	-		
C_{RSS}	Reverse capacitance	-	1.3	-		
Q_G	Total gate charge	-	10.4	-	nC	V_{DS}=400V, V_{GS}=0V to 10V, I_D=1A
Q_{GS}	Gate-source charge	-	2.9	-		
Q_{GD}	Gate-drain charge	-	2.4	-		
Q_{OSS}	Output charge	-	70	-	nC	V_{GS}=0V, V_{DS}=0V to 400V, f=1MHz
$t_{D(on)}$	Turn-on delay	-	10.6	-	ns	V_{DS}=400V, V_{GS}=0V to 10V, I_D=2.1A, $R_{G-on(ext)}$=6.8Ω, $R_{G-off(ext)}$=2.2Ω, L=250μH
t_R	Rise time	-	8.3	-		
$t_{D(off)}$	Turn-off delay	-	26.6	-		
t_F	Fall time	-	43.9	-		

Electrical Parameters

T_j=25°C unless otherwise stated

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
Reverse Device Characteristics						
V_{SD}	Source-Drain reverse voltage	-	2	-	V	V_{GS}=0V, I_S=15A
t_{RR}	Reverse recovery time	-	52	-	ns	I_s=10A, V_{DD}=400V, di/dt=165A/μs
Q_{RR}	Reverse recovery charge	-	40	-	nC	

Typical Characteristics

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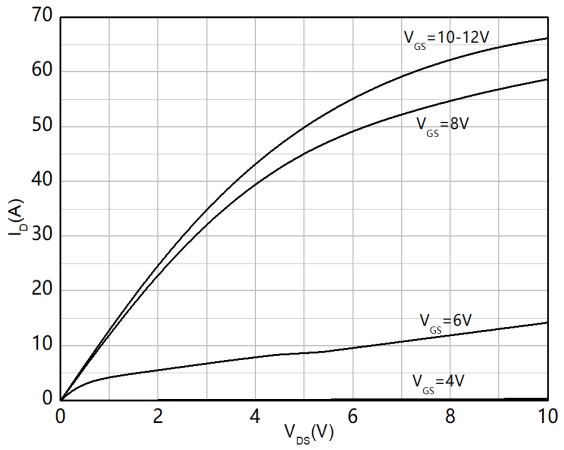

Figure 1. Typical Output Characteristics T_J=25°C

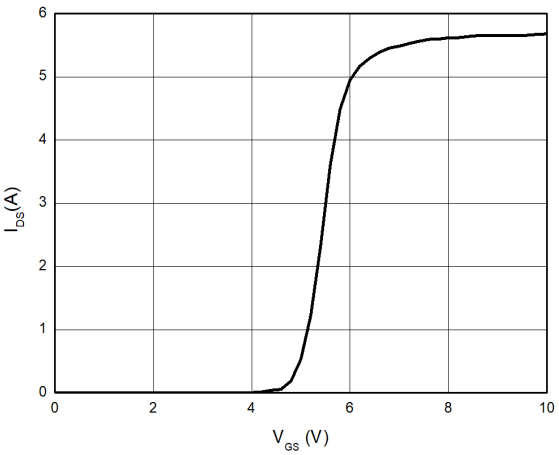

Figure 2. Typical Transfer Characteristics (V_{DS}=1V)

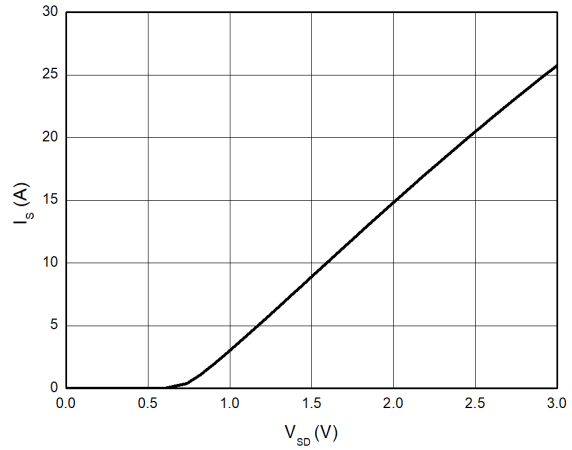

Figure 3. Channel Reverse Characteristics T_J=25°C (V_{GS}=0V)

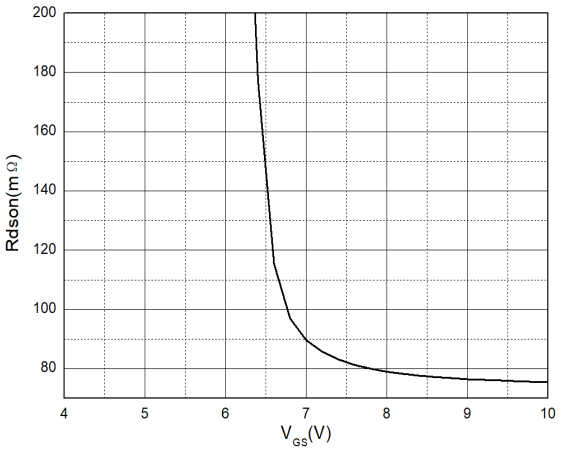

Figure 4. Typical On-state Resistance T_J=25°C (I_D=15A)

Typical Characteristics

T_J=25°C unless otherwise stated

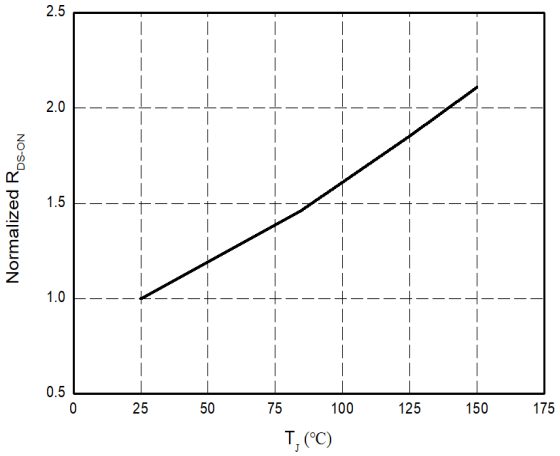

Figure 5. Normalized On-resistance

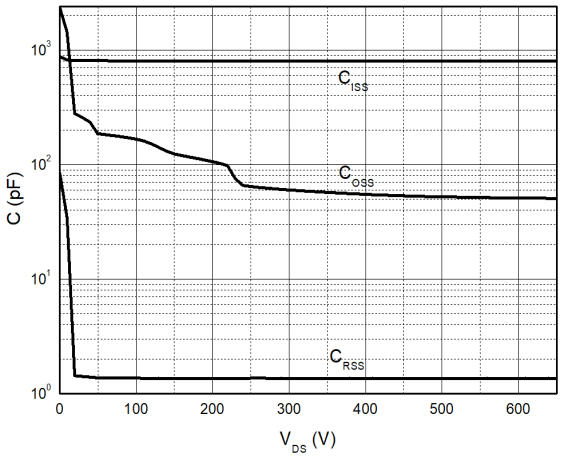

Figure 6. Typical Capacitance (f=1MHz)

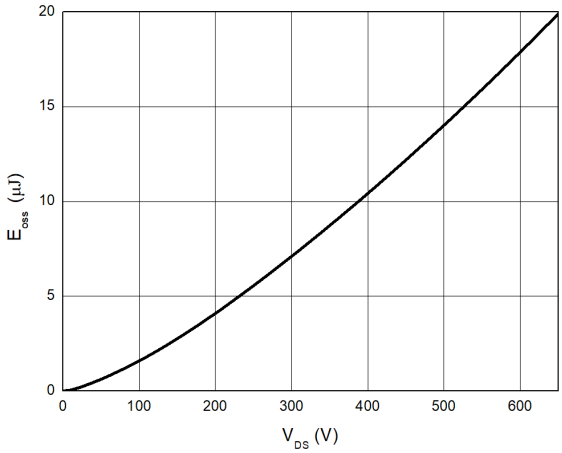

Figure 7. Typical C_{OSS} Stored Energy

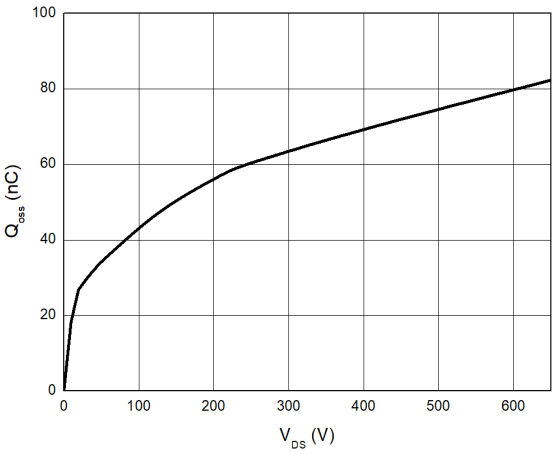

Figure 8. Typical Q_{OSS}

Typical Characteristics

T_j=25°C unless otherwise stated

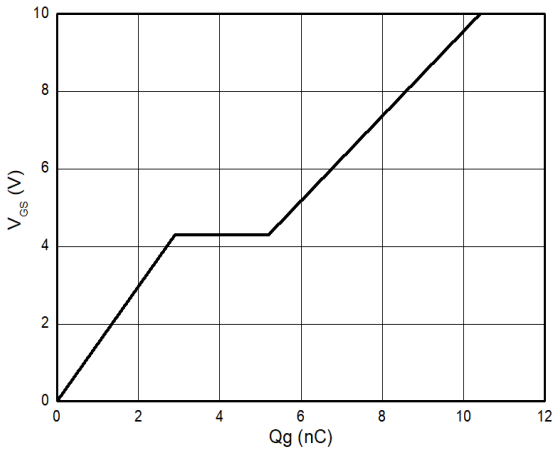

Figure 9. Typical Gate Charge (V_{DS}=400V, I_D=1A)

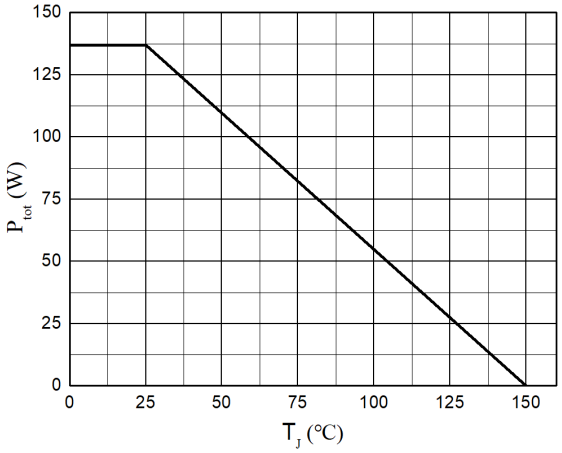

Figure 10. Power Dissipation

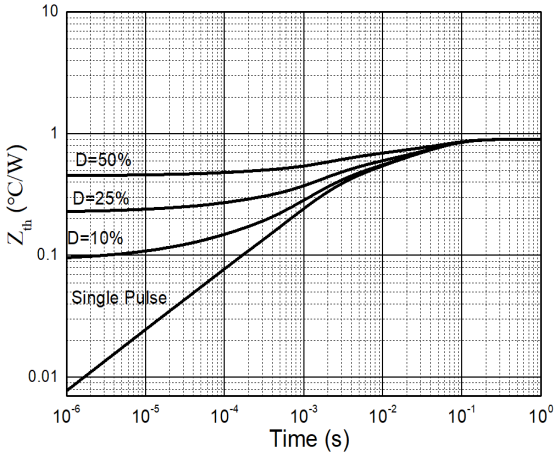

Figure 11. Transient Thermal Resistance

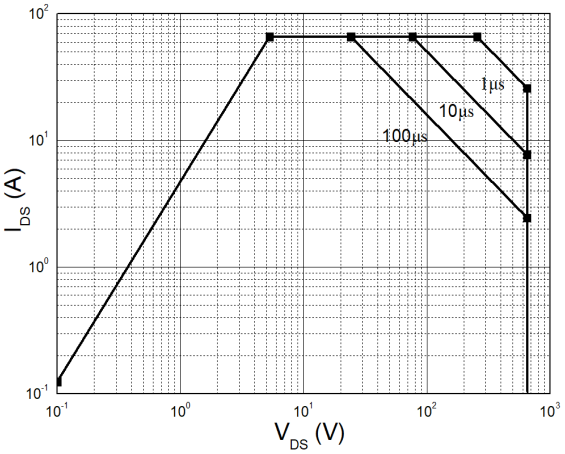

Figure 12. Safe Operating Area TJ=25°C

Typical Characteristics

T_j=25°C unless otherwise stated

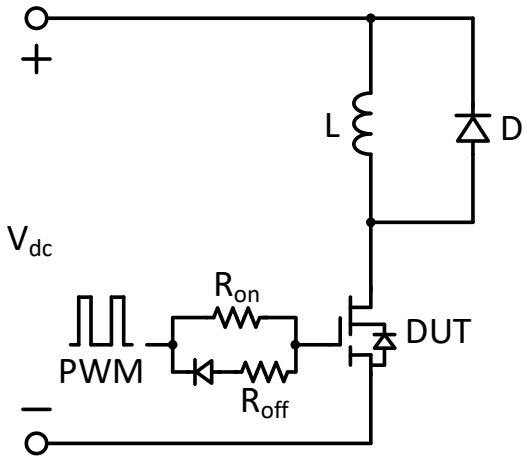

Figure 13. Switching times with inductive load

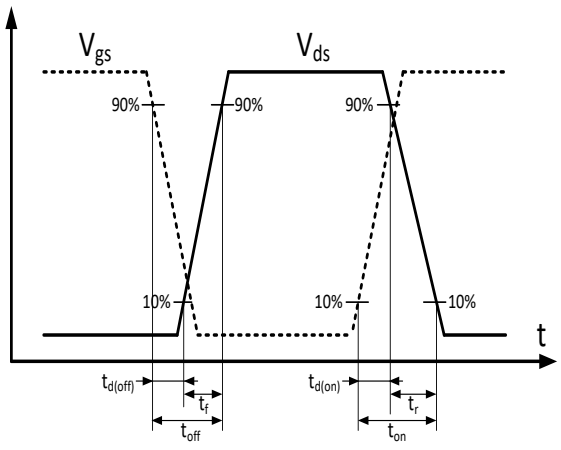

Figure 14. Switching times with waveform

V_{DS}=400V, V_{GS}=0V to 10V, I_D=2.1A,
$R_{G\text{-}on(ext)}$=6.8Ω, $R_{G\text{-}off(ext)}$=2.2Ω, L=250μH

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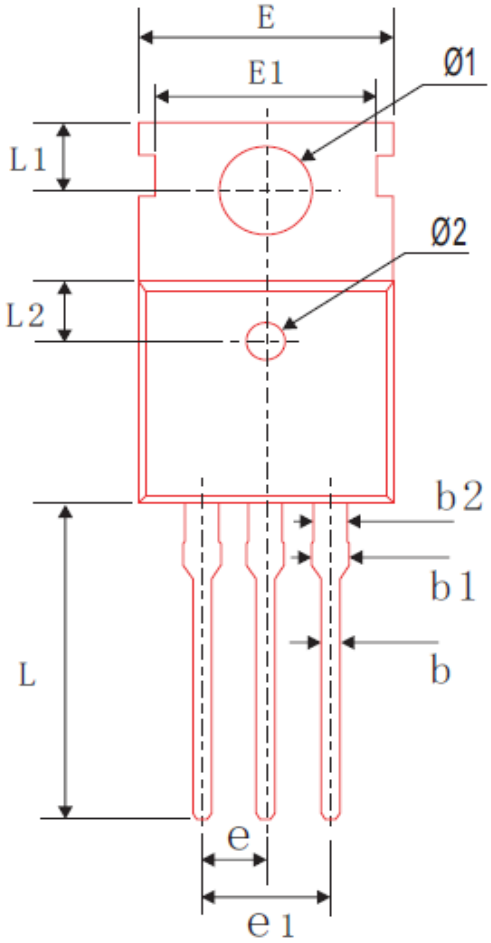
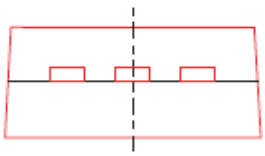
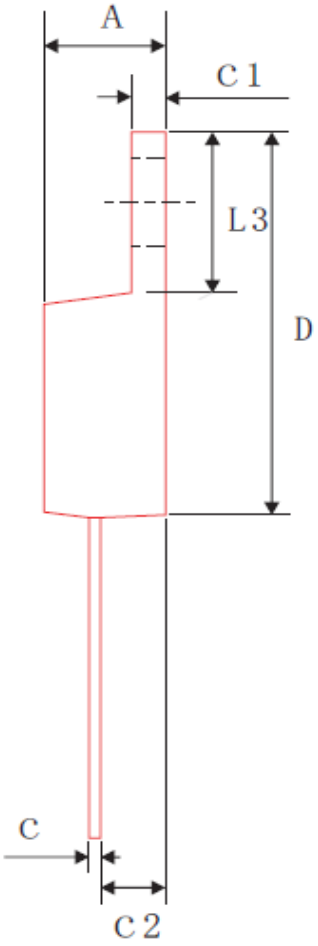
TO220-3L



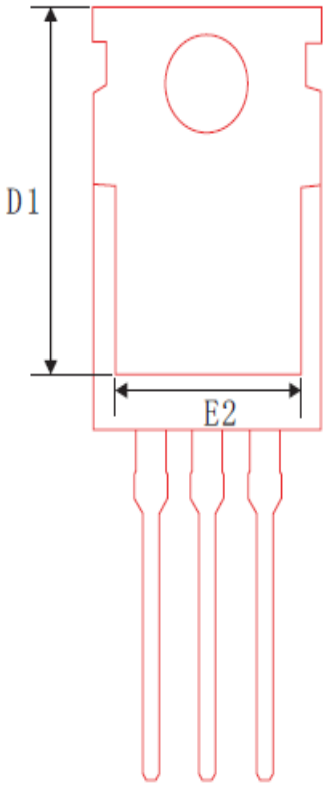
TOP VIEW



SIDE VIEW



SIDE VIEW



BOTTOM VIEW

SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.70
b	0.70	0.80	0.90
b1	——	——	1.42
b2	1.17	1.27	1.37
c	0.40	0.50	0.60
c1	1.25	1.30	1.35
c2	2.20	2.40	2.60
D	15.45	15.65	15.85
D1	13.20	13.40	13.60
E	9.80	10.0	10.2
E1	8.60	8.70	8.80
E2	7.80	8.00	8.20
e1	4.88	5.08	5.28
L	12.95	13.15	13.35
L1	2.70	2.80	2.90
L2	2.40	2.50	2.60
L3	6.30	6.50	6.70
Ø1	3.50	3.60	3.70
Ø2	1.35	1.50	1.65
e	2.54BSC		

Revision history

Major changes since the last revision

Revision	Date	Description of changes
1.0	2025-06-03	Initial release