



CE65H080TOCI

CoreGaN 650V GaN HEMT

Description

The CE65H080TOCI Series 650V, 80mΩ gallium nitride (GaN) FETs are normally-off devices.

Coreenergy 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.

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

Application

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

General Features

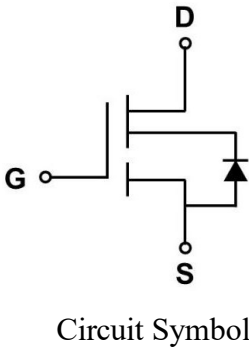
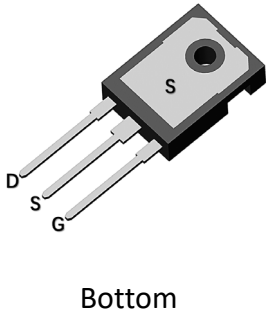
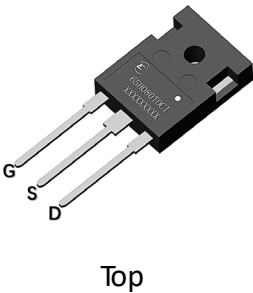
Easy to drive—compatible with standard gate drivers
Low conduction and switching losses
RoHS compliant and Halogen-free

Benefits

Increased efficiency through fast switching
Increased power density
Reduced system size and weight

Ordering Information

Part Number	Package	Package Configuration
CE65H080TOCI	TO247	Source



Features

BV_{DSS}	$R_{DS(ON)}$	I_{DS}	Q_G
650V	80mΩ	26A	10.9 nC



Absolute Maximum Ratings

$T_c = 25^\circ\text{C}$ unless otherwise stated

Symbol	Parameter		Limit value	Unit
V_{DSS}	Drain to source voltage ($T_J = -55^\circ\text{C}$ 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 @ $T_c = 25^\circ\text{C}$ ^b		26	A
	Continuous drain current @ $T_c = 125^\circ\text{C}$ ^b		11.7	
I_{DM}	Pulse drain current (pulse width: 10 μs)		75	A
P_D	Maximum power dissipation @ $T_c = 25^\circ\text{C}$		113	W
T_c	Operating temperature	Case	-55 ~ 150	$^\circ\text{C}$
T_J		Junction	-55 ~ 150	$^\circ\text{C}$
T_S	Storage temperature		-55 ~ 150	$^\circ\text{C}$

a. In off-state, spike duty cycle $D < 0.01$, spike duration $< 1\mu\text{s}$

b. For increased stability at high current operation



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Thermal Resistance

Symbol	Parameter	Limit value	Unit
$R_{\theta JC}$	Junction-to-case	1.1	°C /W



Electrical Parameters

$T_J = 25^\circ\text{C}$ 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	$V_{DS} = 1V, I_{DS} = 1mA$
$\Delta V_{GS(th)}/T_J$	Gate threshold voltage temperature coefficient	-	-7	-	mV/ $^\circ\text{C}$	
$R_{DS(on)}$	Drain-source on-Resistance	-	80	100	m Ω	$V_{GS} = 10V, I_D = 8A, T_J = 25^\circ\text{C}$
		-	180	-		$V_{GS} = 10V, I_D = 8A, T_J = 150^\circ\text{C}$
I_{DSS}	Drain-to-source leakage current	-	6	12	μA	$V_{DS} = 650V, V_{GS} = 0V, T_J = 25^\circ\text{C}$
		-	10	100		$V_{DS} = 650V, V_{GS} = 0V, T_J = 150^\circ\text{C}$
I_{GSS}	Gate-to-source forward leakage current	-	-	± 100	nA	$V_{GS} = \pm 20V$
C_{ISS}	Input capacitance	-	729	-	pF	$V_{GS} = 0V, V_{DS} = 400V, f = 1MHz$
C_{OSS}	Output capacitance	-	75	-		
C_{RSS}	Reverse capacitance	-	0.2	-		
Q_G	Total gate charge	-	10.9	-	nC	$V_{DS} = 400V, V_{GS} = 0V \text{ to } 10V, I_D = 1A$
Q_{GS}	Gate-source charge	-	3.2	-		
Q_{GD}	Gate-drain charge	-	3.4	-		
Q_{OSS}	Output charge	-	101	-	nC	$V_{GS} = 0V, V_{DS} = 0V \text{ to } 400V, f = 1MHz$
$t_{D(on)}$	Turn-on delay	-	10.6	-	ns	$V_{DS} = 400V, V_{GS} = 0V \text{ to } 10V, I_D = 2.1A, R_{G-on(ext)} = 6.8\Omega, R_{G-off(ext)} = 2.2\Omega, L = 250\mu H$
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	-	1.9	-	V	V _{GS} =0V, I _S =15A
t _{RR}	Reverse recovery time	-	52	-	ns	I _S =15A, V _{DD} =400V, di/dt=165A/μs
Q _{RR}	Reverse recovery charge	-	40	-	nC	



Typical Characteristics

$T_j = 25^\circ\text{C}$ unless otherwise stated

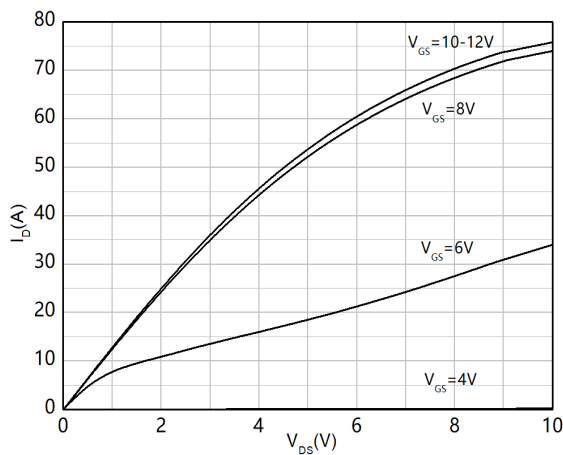


Figure 1. Typical Output Characteristics $T_j = 25^\circ\text{C}$

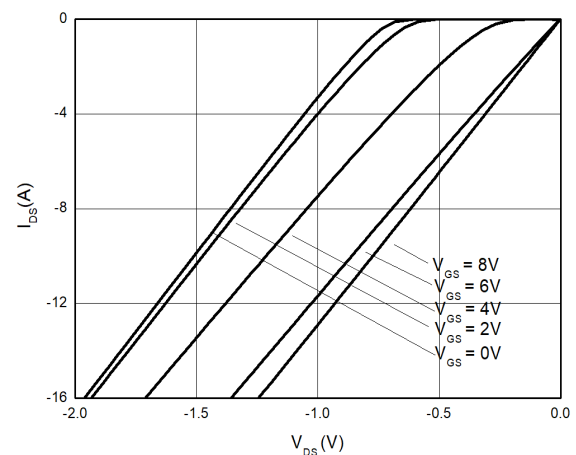


Figure 2. Channel Reverse Characteristics $T_j = 25^\circ\text{C}$

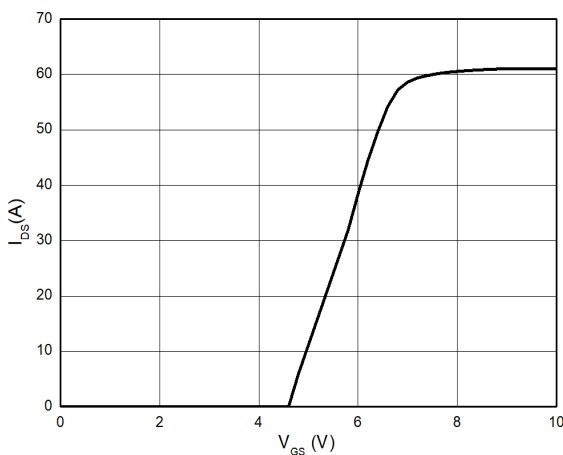


Figure 3. Typical Transfer Characteristics ($V_{DS}=10\text{V}$)

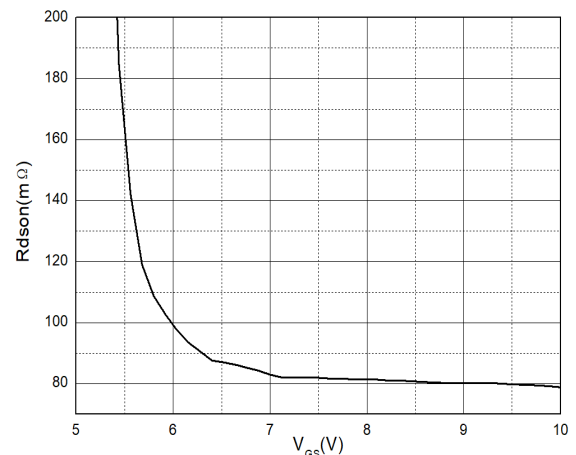


Figure 4. Typical On-state Resistance $T_j = 25^\circ\text{C}$ ($I_D = 1\text{A}$)



Typical Characteristics

$T_j = 25^\circ\text{C}$ unless otherwise stated

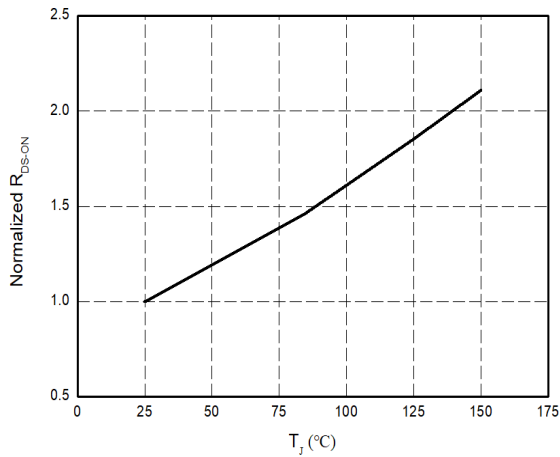


Figure 5. Normalized On-resistance

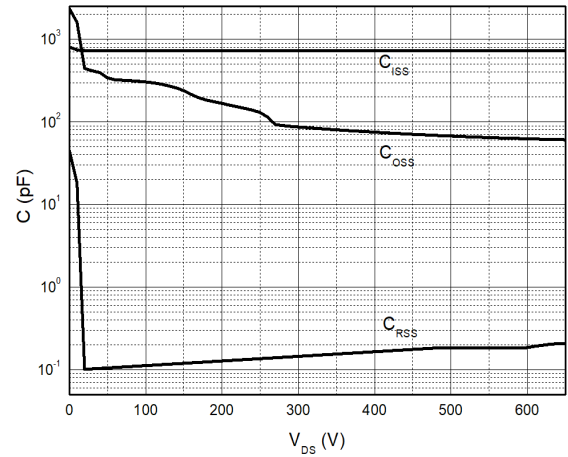


Figure 6. Typical Capacitance (f=1MHz)

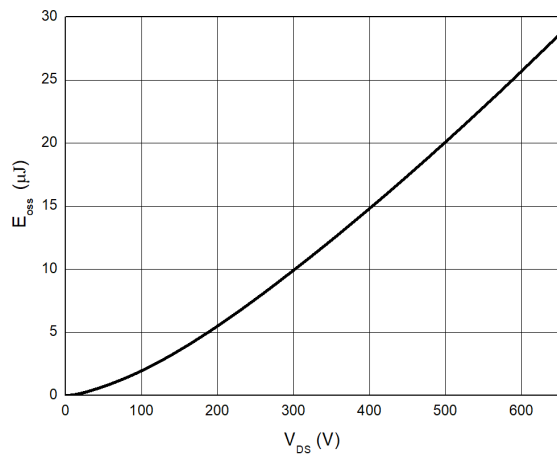


Figure 7. Typical C_{OSS} Stored Energy

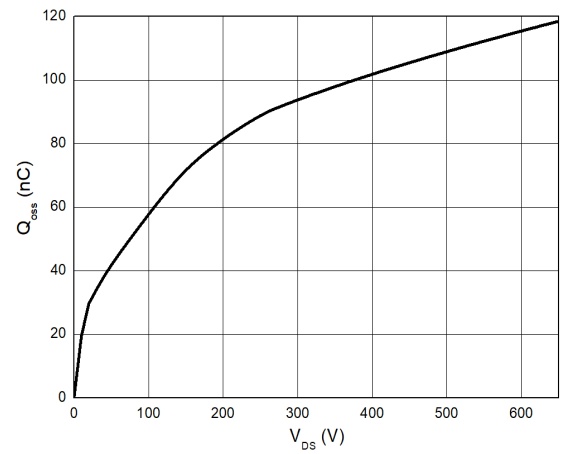


Figure 8. Typical Q_{OSS}



Typical Characteristics

$T_j = 25^\circ\text{C}$ unless otherwise stated

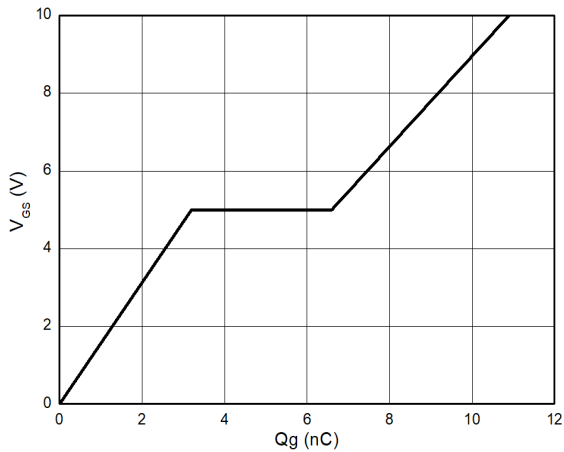


Figure 9. Typical Gate Charge ($V_{DS}=400\text{V}$, $I_D=1\text{A}$)

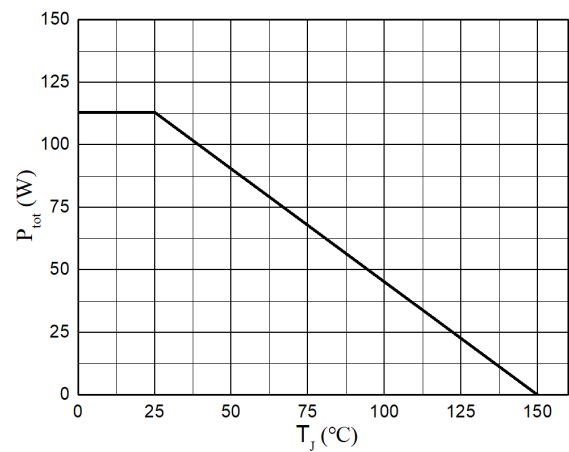


Figure 10. Power Dissipation

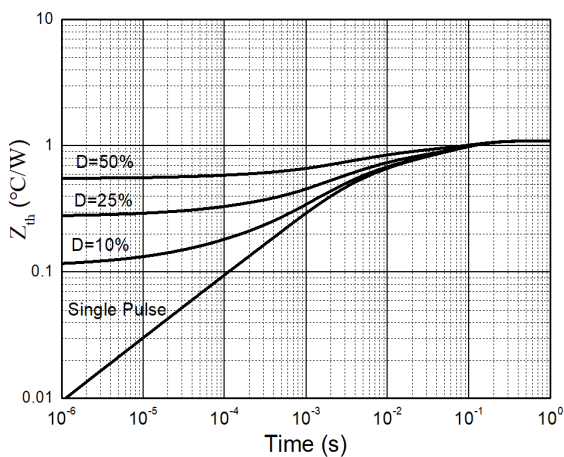


Figure 11. Transient Thermal Resistance

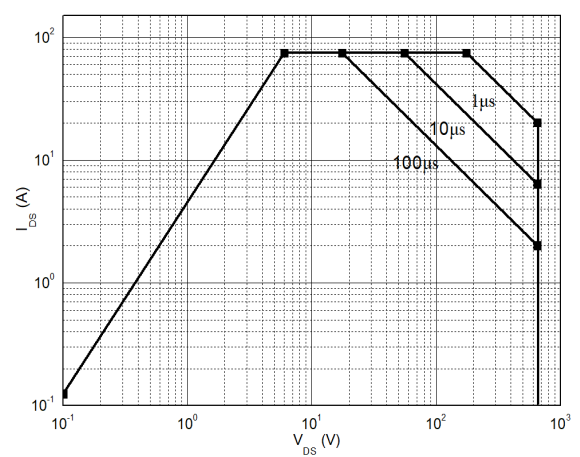


Figure 12. Safe Operating Area $T_J=25^\circ\text{C}$



Typical Characteristics

$T_j=25^{\circ}\text{C}$ unless otherwise stated

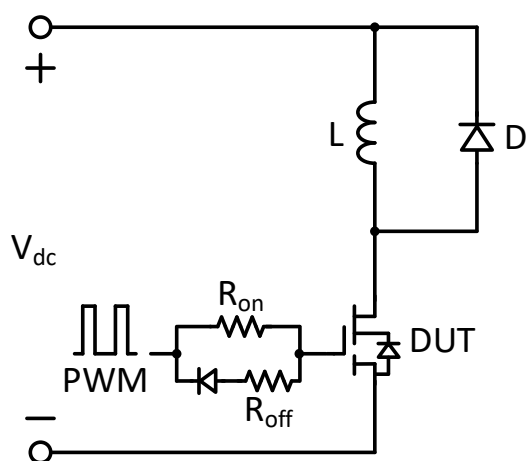


Figure 13. Switching times with inductive load

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

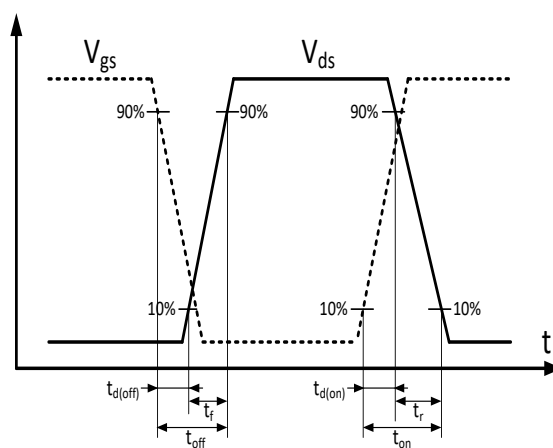
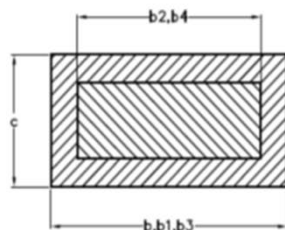
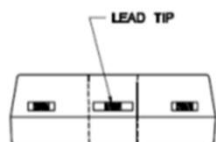
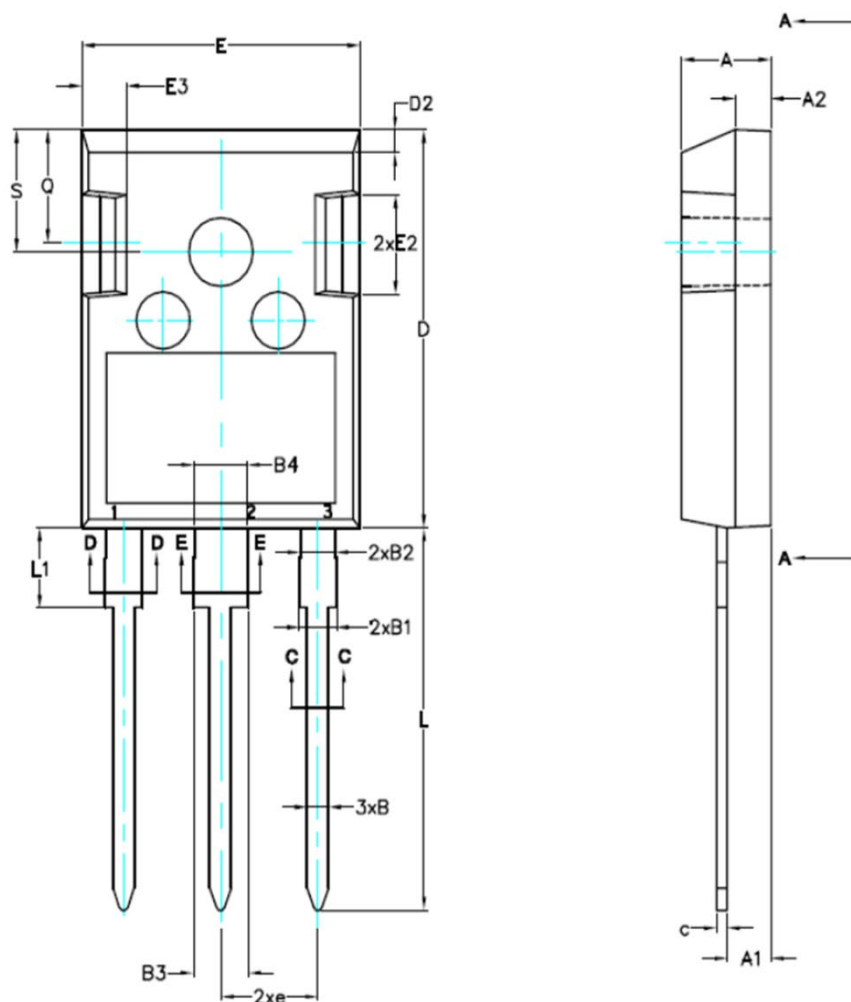


Figure 14. Switching times with waveform

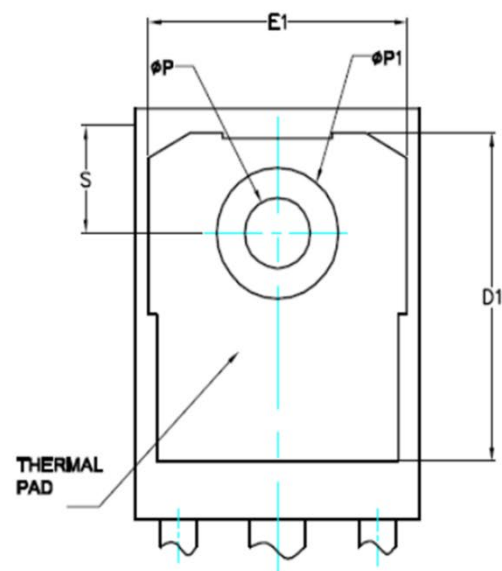


TO247-3L

CE65H080TOCI



SECTION C-C, D-D, E-E



VIEW A-A

SYMBOLS	DIMENSIONS			
	mm		inch	
	MIN.	MAX.	MIN.	MAX.
A	4.85	5.15	0.191	0.203
A1	2.25	2.55	0.088	0.100
A2	1.85	2.15	0.073	0.085
B	1.04	1.33	0.041	0.052
B1	1.90	2.35	0.075	0.093
B2	1.90	2.15	0.075	0.085
B3	2.90	3.35	0.114	0.132
B4	2.90	3.15	0.114	0.124
c	0.55	0.68	0.022	0.027
D	20.8	21.10	0.819	0.831
D1	16.25	17.65	0.640	0.695
D2	0.95	1.35	0.037	0.053
E	15.70	16.10	0.618	0.634
E1	13.50	14.20	0.531	0.559
E2	3.80	5.00	0.150	0.197
E3	1.00	2.6	0.039	0.102
e	5.46BSC		0.215BSC	
L	19.80	20.3	0.779	0.799
L1	4.00	4.50	0.157	0.177
φP	3.50	3.70	0.138	0.145
φP1	—	7.19	—	0.291
Q	5.40	6.00	0.212	0.236
S	6.2BSC		0.244BSC	



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Revision history

Major changes since the last revision

Revision	Date	Description of changes
1.0	2024-07-20	Initial release
2.0	2025-01-02	Optimize application platform testing