

PRIMARY CHARACTERISTICS

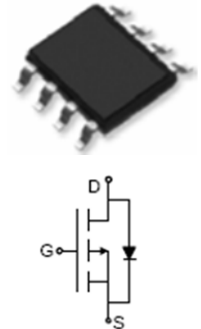
BV _{DSS}	R _{DS(on)} MAX.	I _D
-30V	10.5mΩ@V _{GS} =-10V	-18A
	15mΩ@V _{GS} =-4.5V	

GENERAL DESCRIPTION

- Super high dense cell trench design for low RDS(on)
- Rugged and reliable
- Surface Mount package

SOP-8 PACKAGE

Marking : 4409



APPLICATION

- Case : Molded plastic,SOP-8
- Polarity : Shown above
- Terminals :Plated terminals,
solderable per
MIL-STD-750,Method 2026
- Epoxy : UL94-V0 rated flame
retardant

Maximum ratings (Ta=25°C unless otherwise noted)

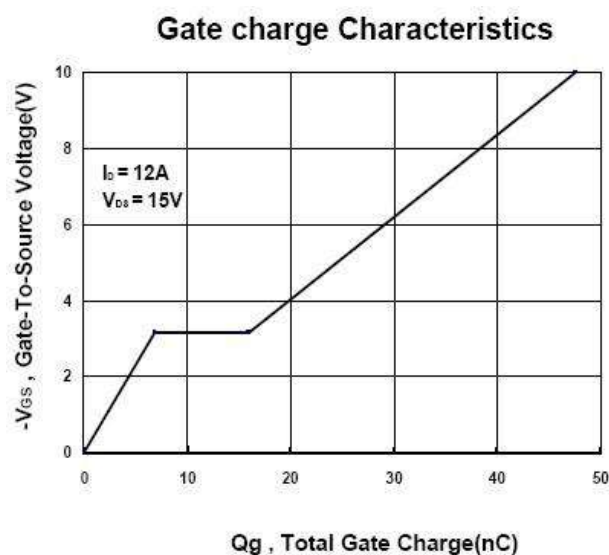
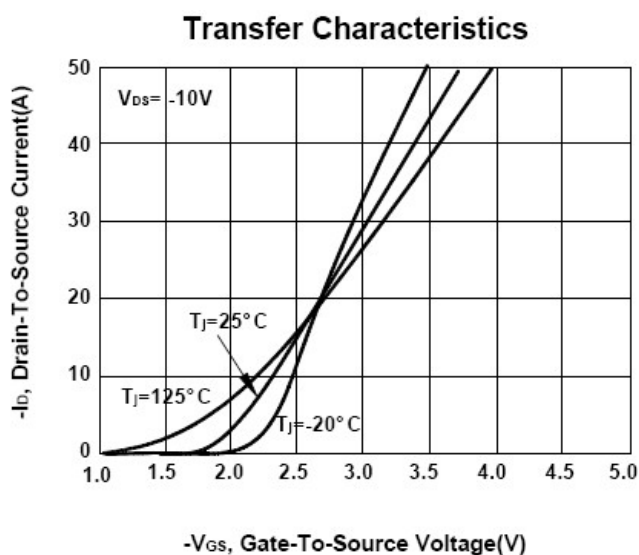
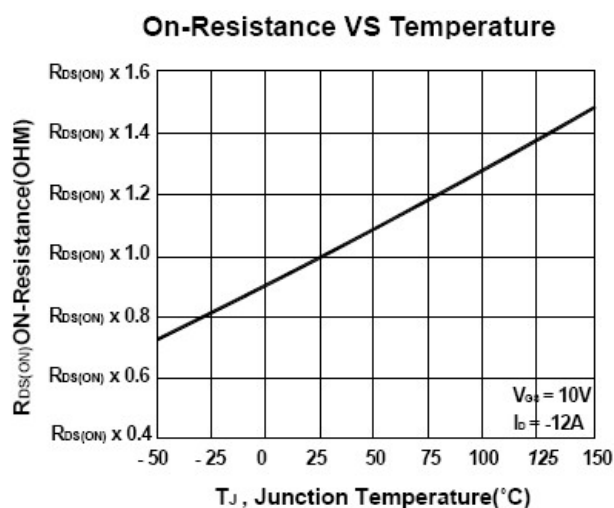
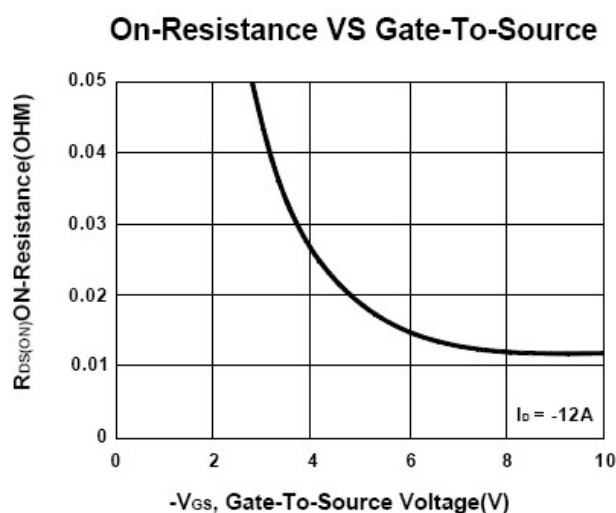
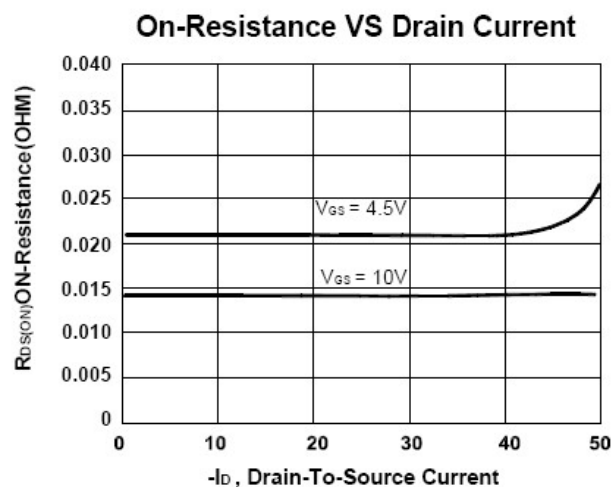
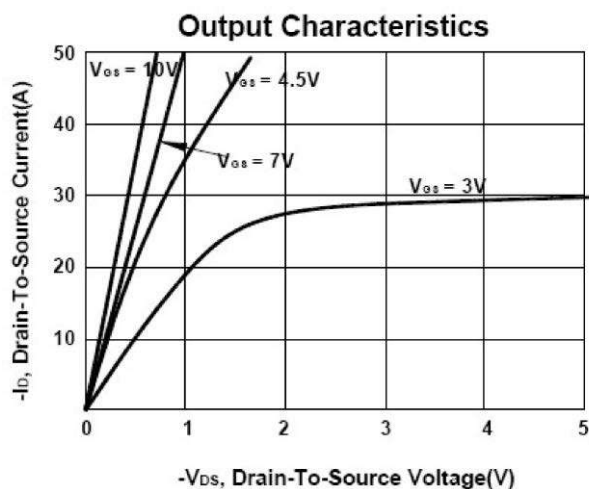
Symbol	Rating	Test Condition	Value	Unit
V _{DS}	Drain-Source Voltage		-30	V
V _{GS}	Gate-Source Voltage		±20	V
I _D	Collector Current — Continuous	T _A =25°C	-18	A
		T _A =70°C	-9	
I _{DM}	Pulsed Drain Current ¹	T _A =25°C	-70	A
I _{AS}	Avalanche Current		-43	A
E _{AS}	Avalanche Energy	L=0.1mH	90	mJ
P _D	Power Dissipation	T _A =25°C	2.5	W
		T _A =70°C	1.6	
R _{θJA}	Thermal Resistance, Junction to Ambient		50	°C/W
R _{θJC}	Thermal Resistance, Junction to Case		25	°C/W
T _J , T _{stg}	Operating Junction and Storage Temperature		-55 to +150	°C

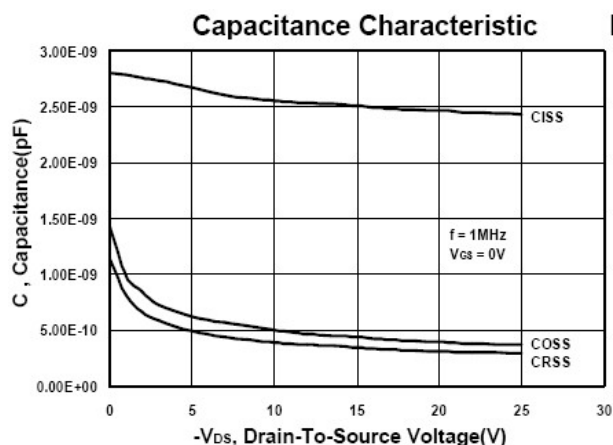
Electrical Characteristics (@TA = 25°C, unless otherwise noted.)

Symbol	Characteristic	Test Condition	Min.	Typ.	Max.	Unit
Static						
$V_{(BR)DSS}$	Drain-source breakdown voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	—	—	V
I_{GSS}	Gate-body leakage	$V_{DS}=0V, V_{GS}=\pm 25V$	—	—	± 100	nA
I_{DSS}	Zero gate voltage drain current	$V_{DS}=-24V, V_{GS}=0V$	—	—	-1	μA
		$V_{DS}=-20V, V_{GS}=0V, T_j=125^{\circ}C$			-10	
$V_{GS(th)}$	Gate-threshold voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.7	-3	V
$R_{DS(on)}$	Drain-source on-resistance	$V_{GS}=-4.5V, I_D=-10A$		11	15	m Ω
		$V_{GS}=-10V, I_D=-12A$		8.5	10.5	
g_{fs}^{-1}	Forward transconductance	$V_{DS}=-10V, I_D=-12A$	—	28	—	S
Dynamic Characteristics ²						
$Q_g(V_{GS}=10V)$	Total gate charge	$V_{DS}=0.5V_{(BR)DSS}, V_{GS}=-10V, I_D=-12A$	—	48	—	nC
$Q_g(V_{GS}=4.5V)$				26		
Q_{gs}	Gate-source charge		—	7	—	
Q_{gd}	Gate-drain charge		—	9	—	
C_{iss}	Input capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$	—	2510	—	pF
C_{oss}	Output capacitance		—	449	—	
C_{rss}	Reverse transfer capacitance		—	349	—	
Switching Characteristics ²						
$t_{d(on)}$	Turn-on delay time	$V_{DD}=-15V$ $I_D=-1A$ $V_{GS}=-10V, R_g=6\Omega$	—	12	—	ns
t_r	Rise time		—	16	—	
$t_{d(off)}$	Turn-off delay time		—	50	—	
t_f	Fall time		—	100	—	
Drain-Source Diode Characteristics and Maximum Ratings						
I_s	Maximum Continuous Drain to Source Diode Forward Current		—	—	-2.1	A
V_{SD}^{-1}	Diode forward voltage	$I_S=I_F, V_{GS}=0V$	—	—	-1.2	V

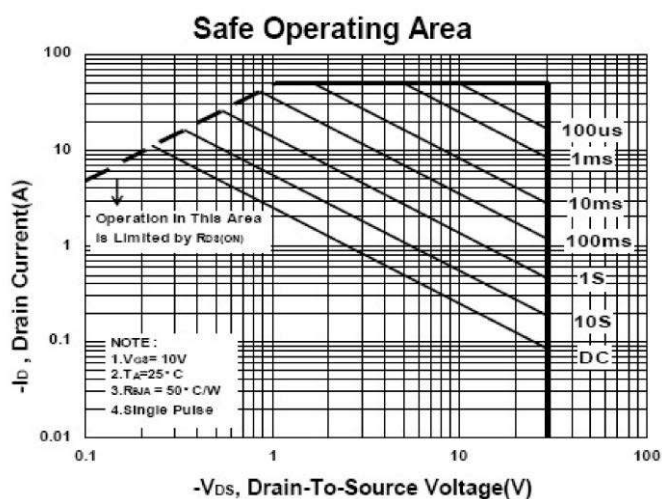
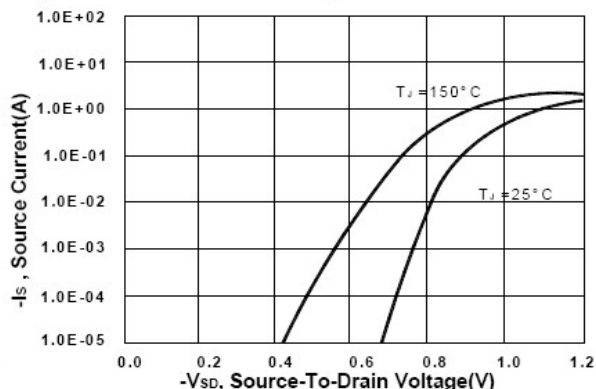
Note

1. Pulse width limited by maximum junction temperature
2. Pulse Test Pulse width $\leq 300\mu\text{sec}$, Duty Cycle $\leq 2\%$
3. Independent of operating production testing

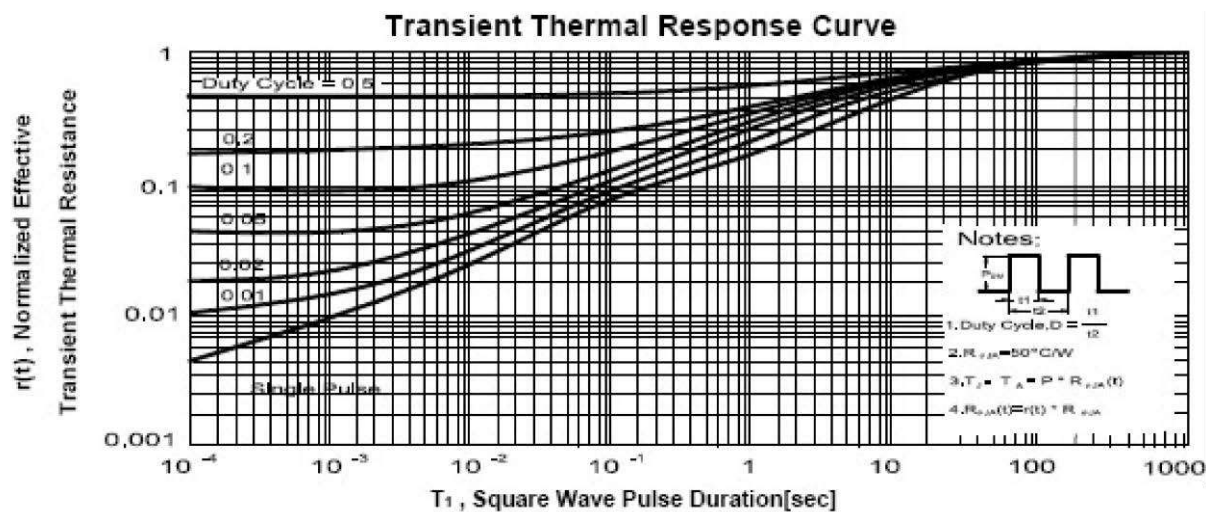
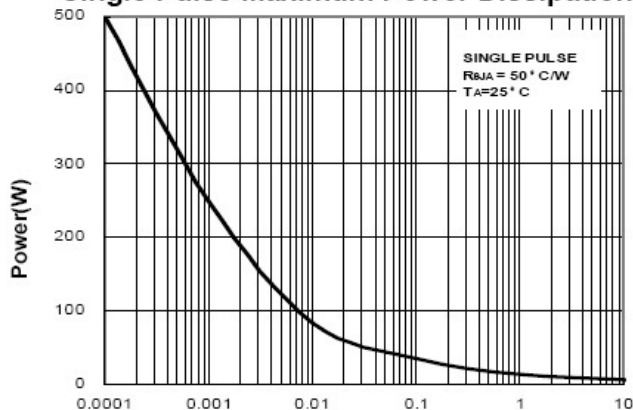




Body Diode Forward Voltage VS Source current

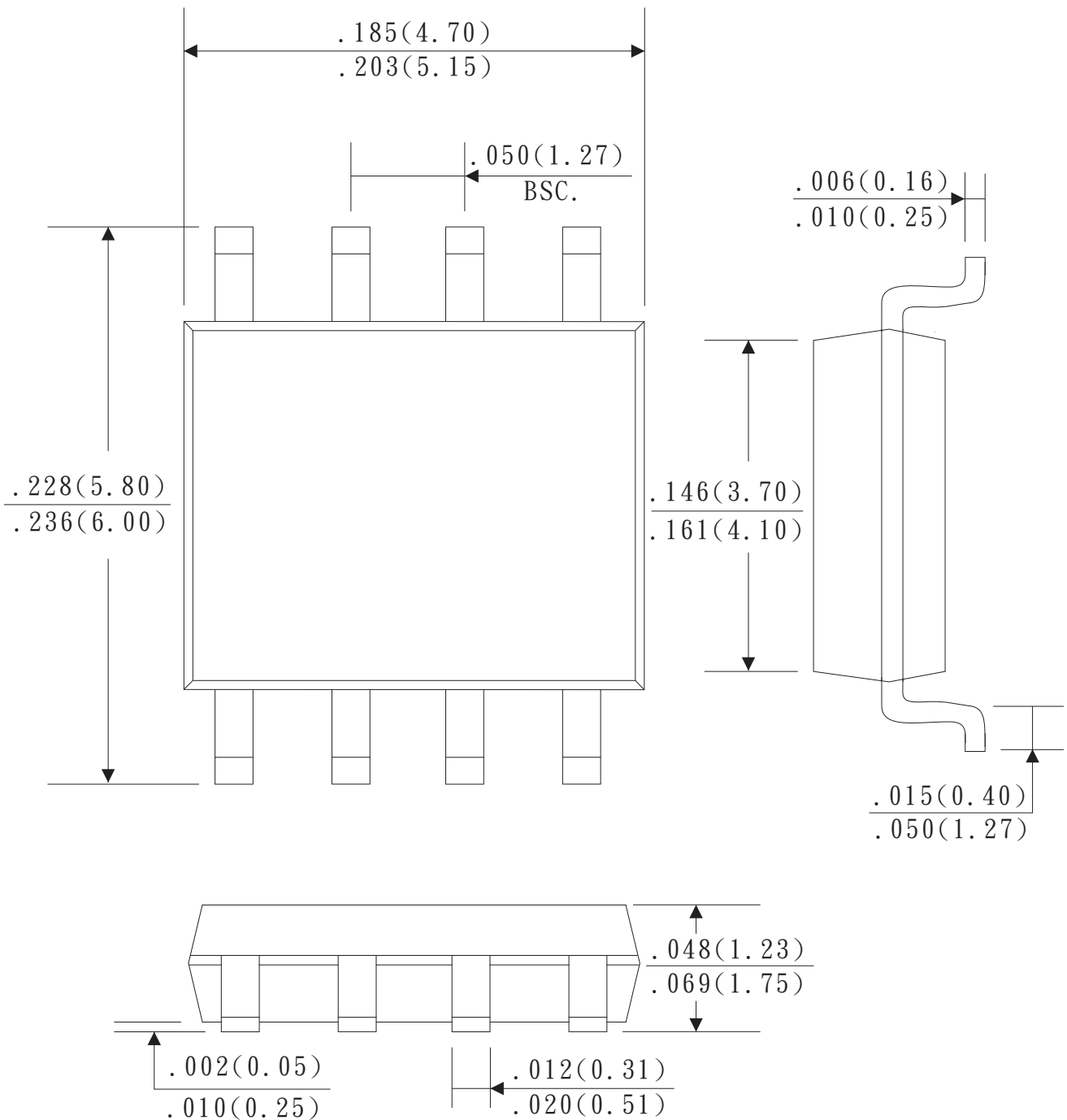


Single Pulse Maximum Power Dissipation



Outline Drawing

SOP-8



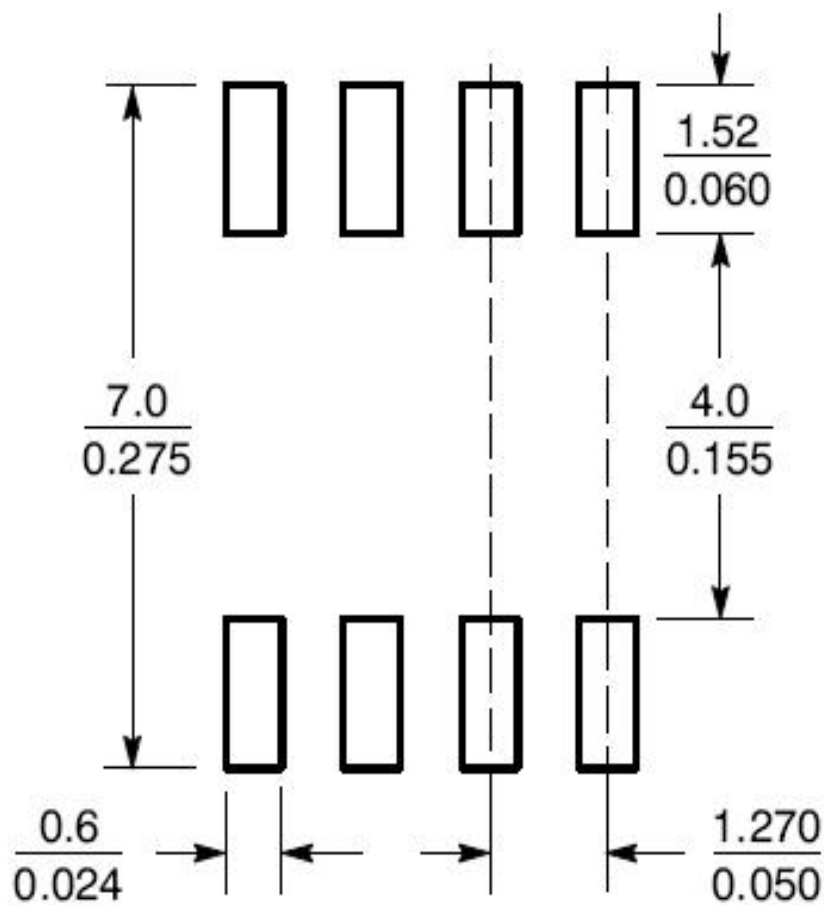
Dimensions in inches and (millimeters)

Rev.C



Suggested Soldering Pad Layout

SOP-8



Dimensions in inches and (millimeters)

RevA



Ordering Information:

Device PN	Packing
SEQ4409 -T ⁽¹⁾ H ⁽²⁾ -WS ⁽³⁾	Tape&Reel: 2.5 Kpcs/Reel

Note: (1) Packing code, Tape & Reel Packing

(2) Halogen free product for packing code suffix "H"

(3) WS : Willas brand abbreviation, Label Type does not display

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