

N-Channel Enhancement-Mode MOSFET (100V, 120A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m Ω) Max
100V	120A	4.3 @ $V_{GS} = 10V, I_D = 88A$

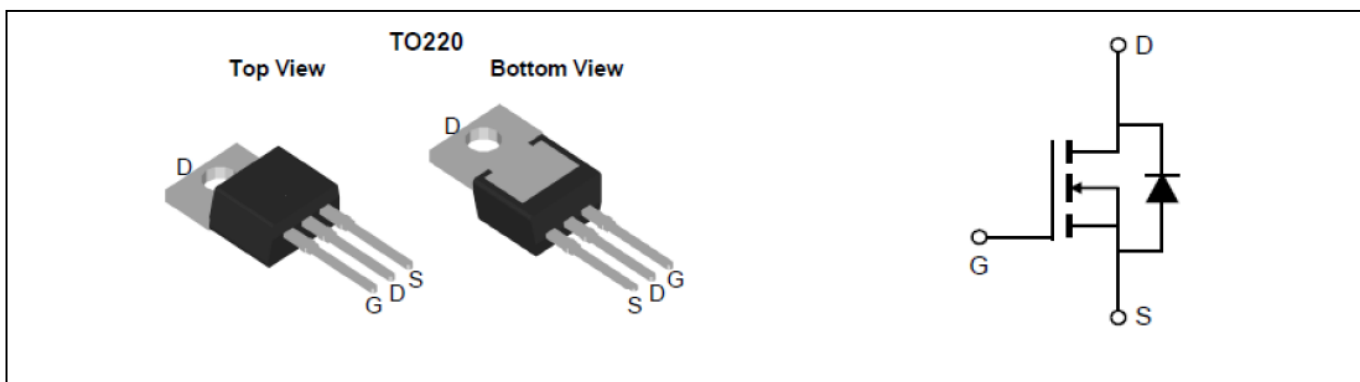
Features

- Special process technology for high ESD capability
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation
- Ordering information: GA120N10 - (Lead (Pb) - free and halogen - free)
- High density cell design for ultra low $R_{DS(on)}$
- Good stability and uniformity with high EAS

Application

- Motor Drives
- DC/DC converter
- UPS (Uninterruptible Power Supplies)
- General purpose applications

RoHS+HF



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current (Continuous)	120	A
I_{DM}	Drain Current (Pulsed)	480	A
P_D	Total Power Dissipation @ $T_C = 25^\circ\text{C}$	230	W
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
I_{AS}	Avalanche Current with Single Pulse ($L = 0.5\text{mH}$)	24	A
E_{AS}	Avalanche Energy with Single Pulse ($L = 0.5\text{mH}$)	144	mJ
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	62.5	$^\circ\text{C}/\text{W}$

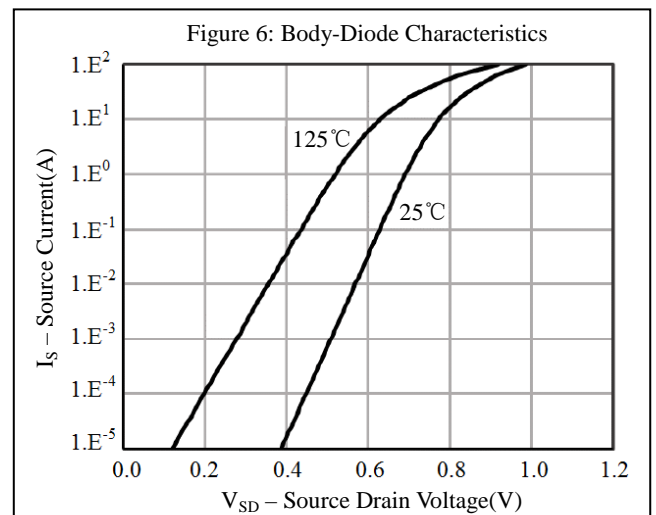
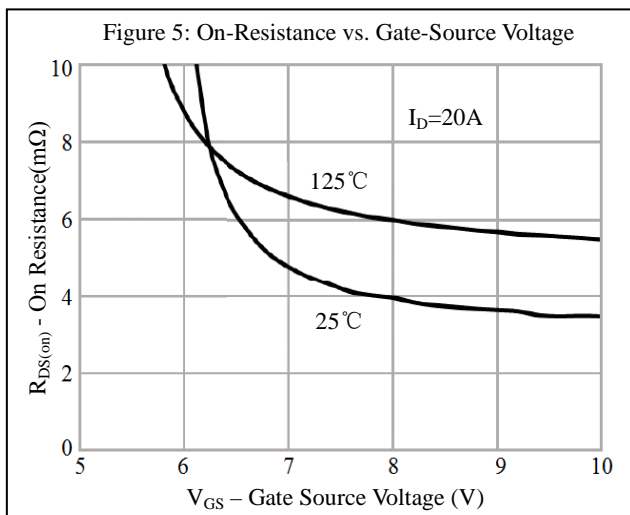
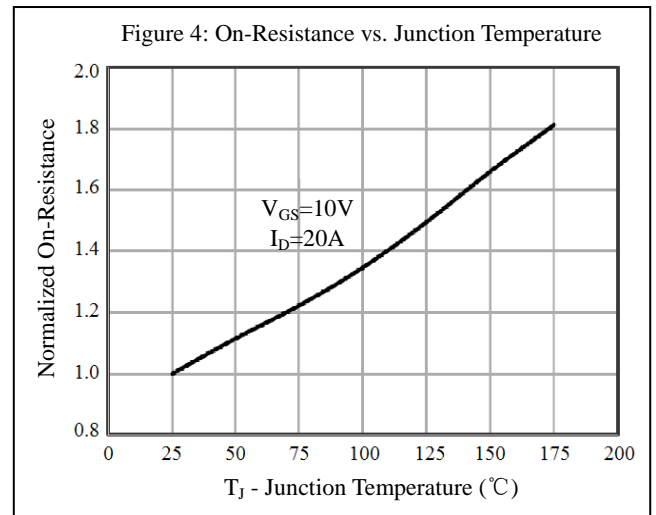
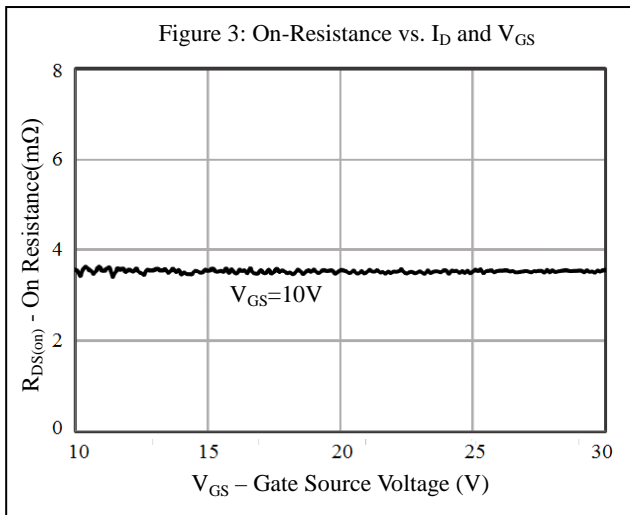
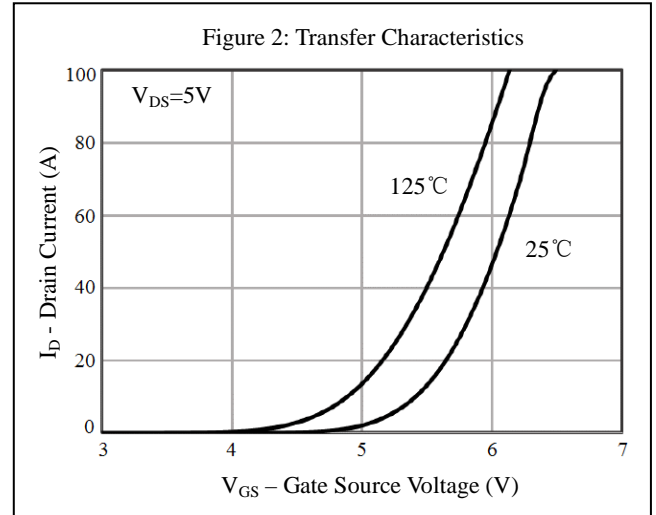
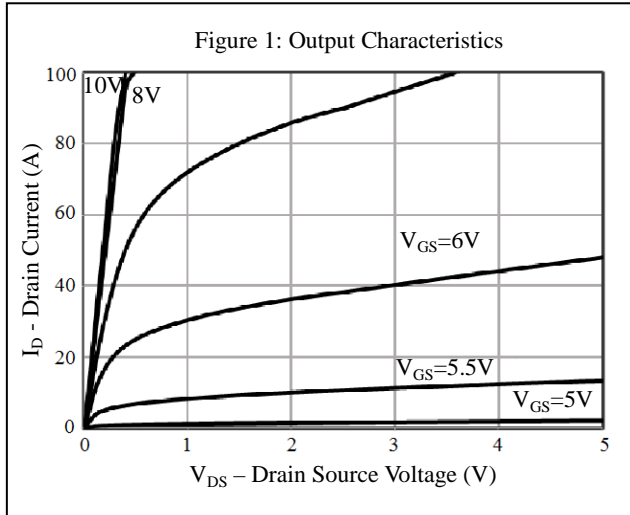
Electrical Characteristics (T_A=25°C, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =80V, V _{GS} =0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
• On Characteristics^c						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2	-	4	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =50A	-	4.0	4.5	mΩ
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f= 1MHz	-	3.3	-	Ω
g _{fs}	Forward Transconductance	V _{DS} =50V, I _D =20A	-	40	-	S
• Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	-	6900	-	pF
C _{oss}	Output Capacitance		-	1250	-	
C _{rss}	Reverse Transfer Capacitance		-	47	-	
• Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =50V, I _D =20A, V _{GS} =10V	-	117	-	nC
Q _{gs}	Gate-Source Charge		-	40	-	
Q _{gd}	Gate-Drain Charge		-	37	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} =50V, R _L =2.5Ω, I _D =20A, V _{GS} =10V, R _G =10Ω	-	48	-	nS
t _r	Turn-on Rise Time		-	56	-	
t _{d(off)}	Turn-off Delay Time		-	75	-	
t _f	Turn-off Fall Time		-	33	-	
• Drain-Source Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _{SD} =50A	-	-	1.3	V

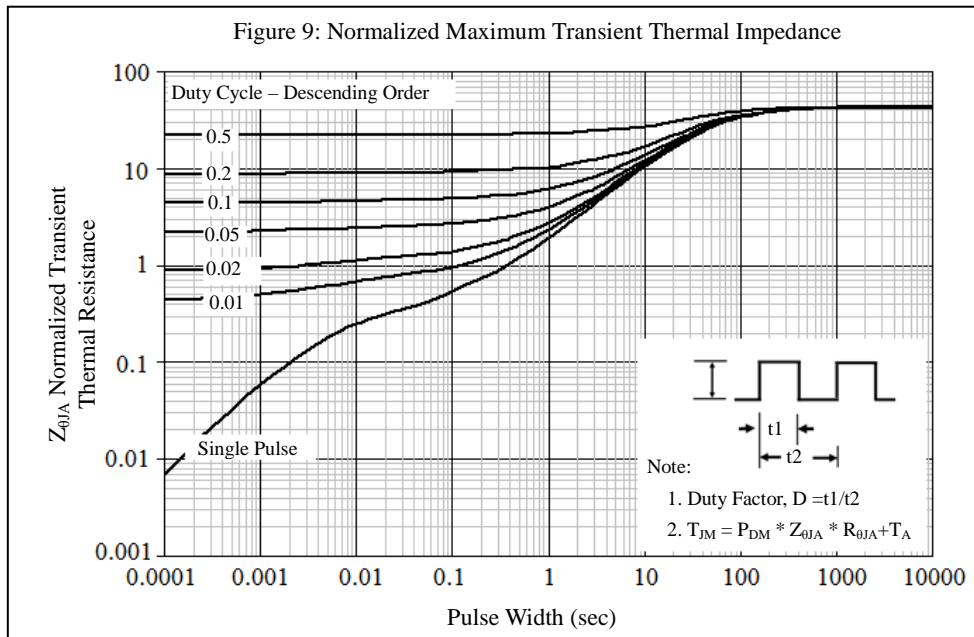
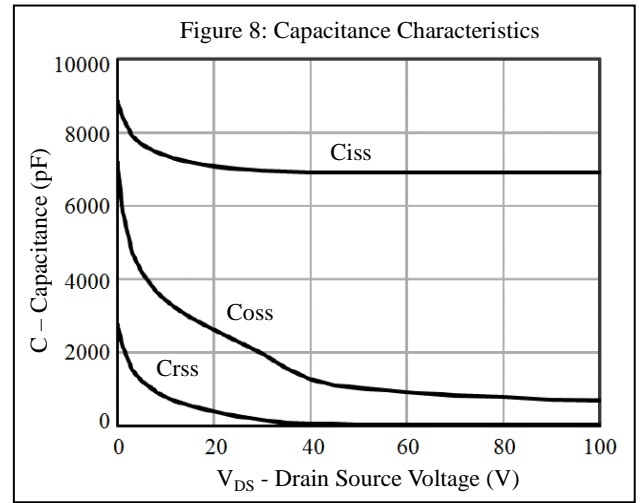
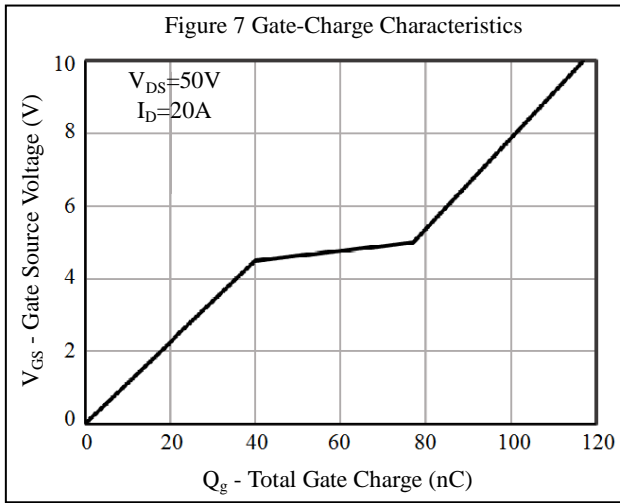
Note:

c: Guaranteed by design , not subject to production testing .

Typical Performance Characteristics

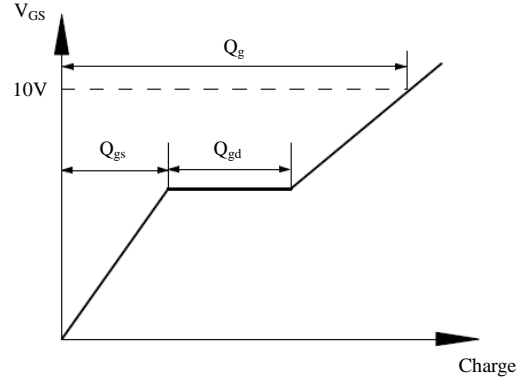
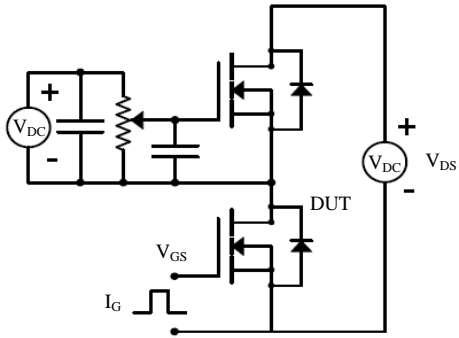


Typical Performance Characteristics

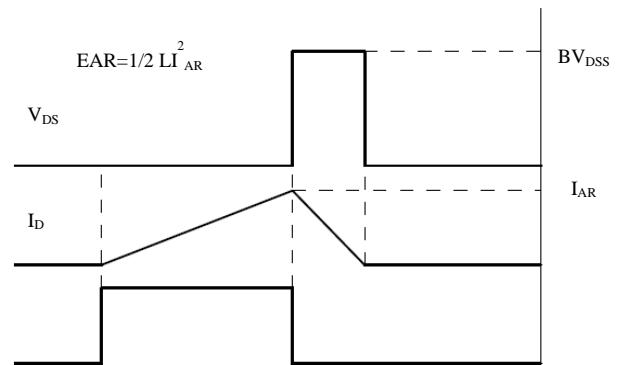
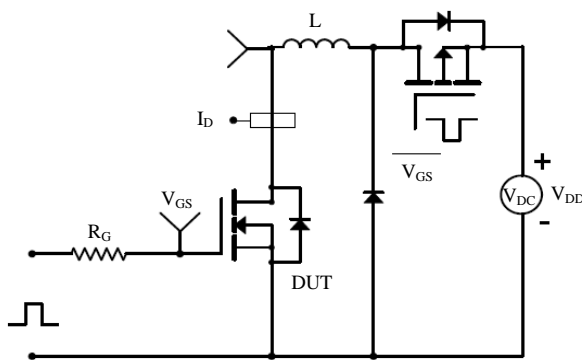
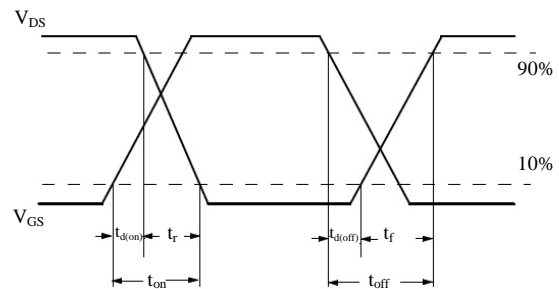
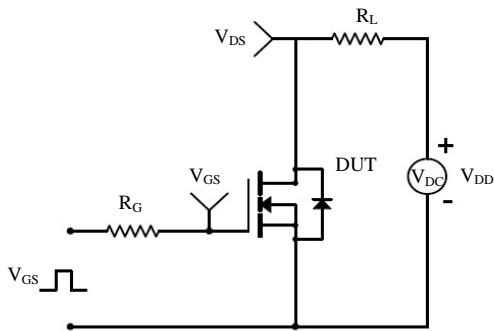


Test Circuit & Waveform

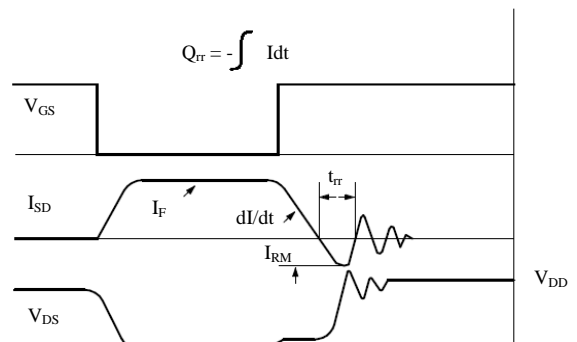
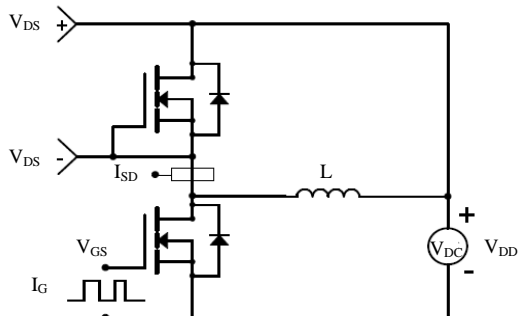
Gate Charge Test Circuit & Waveform



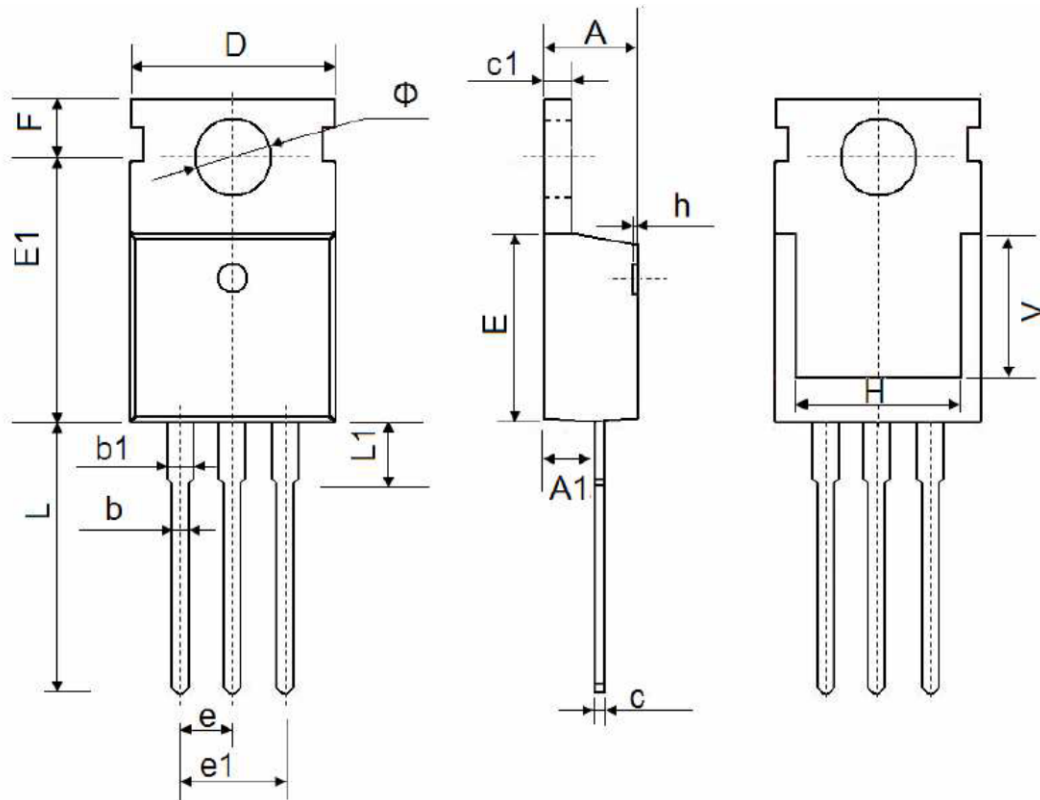
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TO-220-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF		0.295 REF	
Φ	3.400	3.800	0.134	0.150



Notice

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