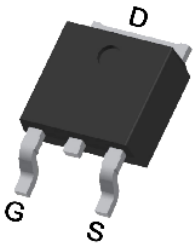
XPXG60N04K

40V N-Channel Enhancement Mode MOSFET

Description

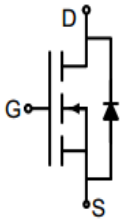
The XPXG60N04K uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.



TO-252

General Features

- V_{DS} 40V
- I_D (at V_{GS} = 10V) 60A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 7mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 12 mΩ
- 100% Avalanche Tested
- RoHS Compliant



Schematic diagram

Application

- Power switch
- DC/DC converters

Device	Package	Marking	Packaging
XPXG60N04K	TO-252	XPXG60N04K	2500pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Continuous Drain Current	I_D	60	A
Pulsed Drain Current (note1)	I_{DM}	200	A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation	P_D	65	W
Single pulse avalanche energy （note3）	E_{AS}	73	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	2.3	ºC/W

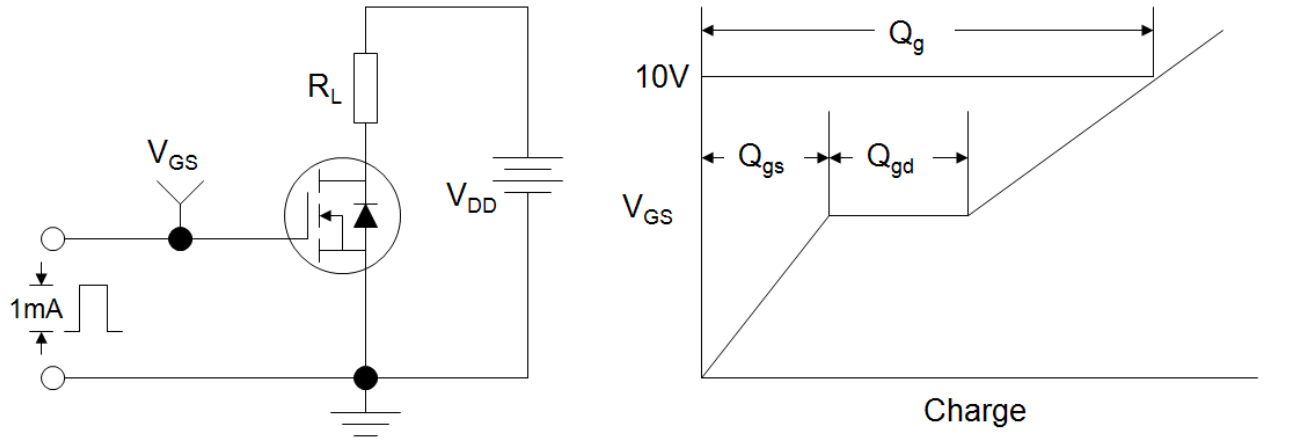
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	40	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.1	1.7	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 30A	--	5.3	7	mΩ
		V_{GS} = 4.5V, I_D = 20A	--	7	12	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=20A	15	--	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 20V, f = 1.0MHz	--	1030	--	pF
Output Capacitance	C_{oss}		--	280	--	
Reverse Transfer Capacitance	C_{rss}		--	190	--	
Total Gate Charge	Q_g	V_{DD} = 20V, I_D = 20A, V_{GS} = 10V	--	29	--	nC
Gate-Source Charge	Q_{gs}		--	4.5	--	
Gate-Drain Charge	Q_{gd}		--	6.5	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 20V, I_D = 2A, R_G = 3Ω	--	6.5	--	ns
Turn-on Rise Time	t_r		--	17	--	
Turn-off Delay Time	$t_{d(off)}$		--	30	--	
Turn-off Fall Time	t_f		--	17	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	60	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 30A, V_{GS} = 0V	--	--	1.2	V
Body Diode Reverse Recovery Time	trr	IF=20A,dI/dt=100A/μs	--	29	--	ns
Body Diode Reverse Recovery Charge	Qrr		--	26	--	nc

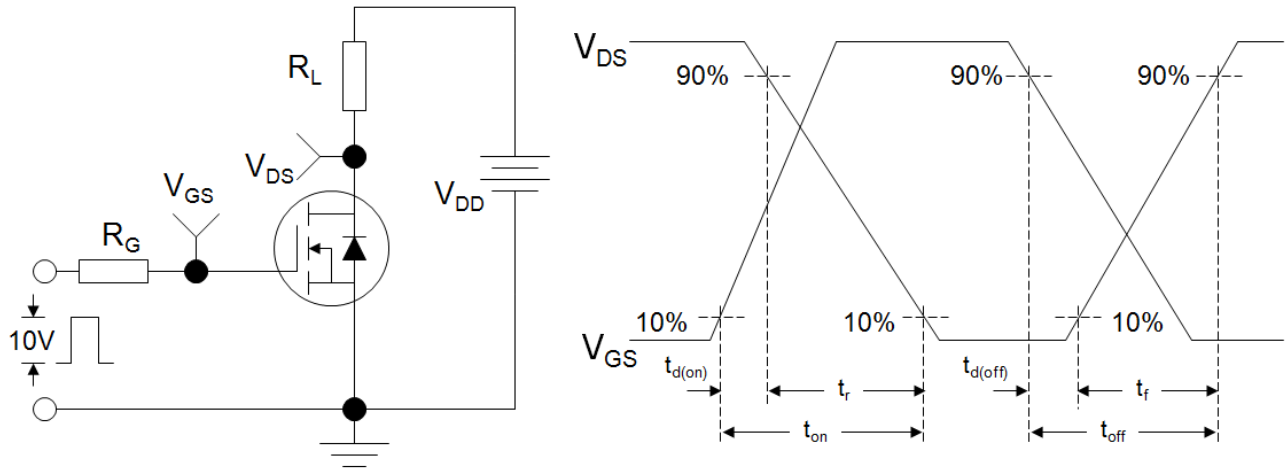
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G
3. EAS condition : Tj=25℃ ,VDD=40V,VGS=10V,L=0.5mH,Rg=25Ω

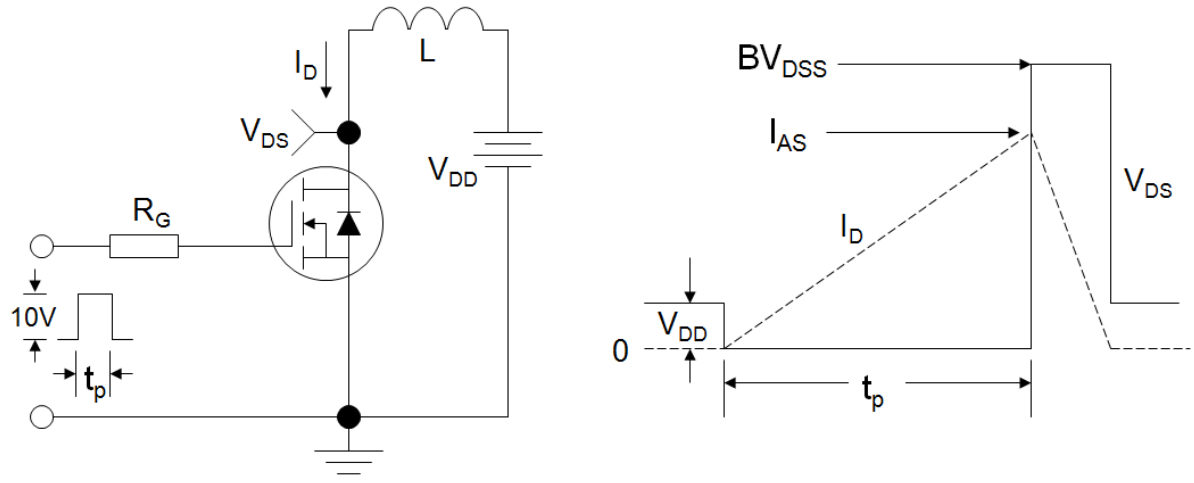
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

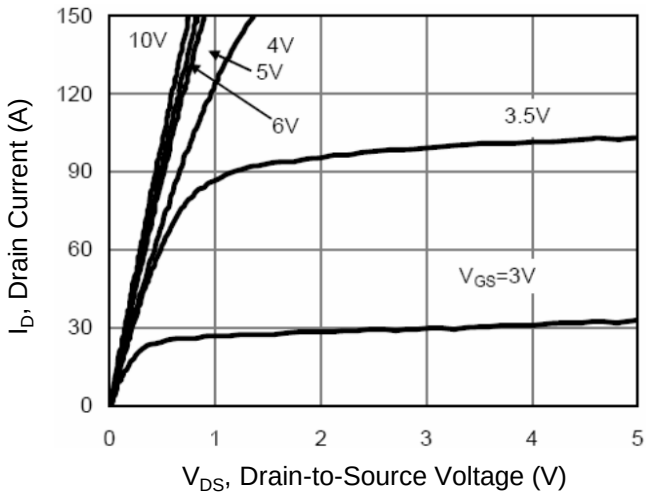


Figure 2. Transfer Characteristics

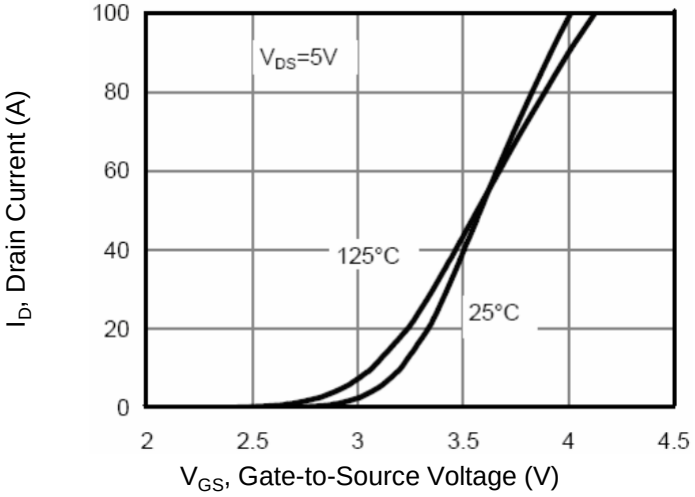


Figure 3. Gate Charge

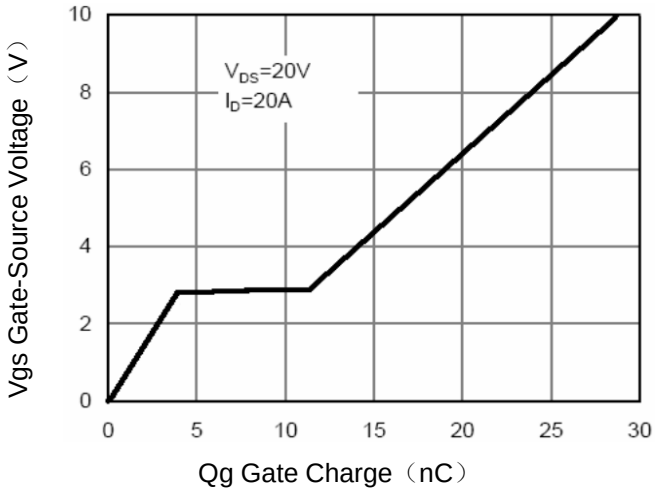


Figure 4. Drain Source On Resistance

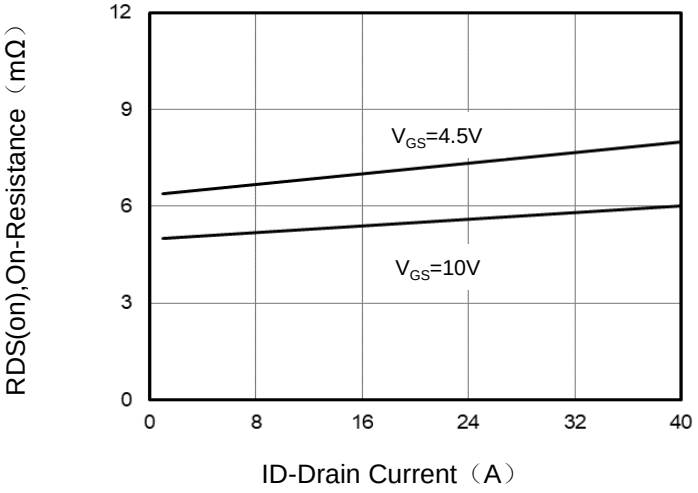


Figure 5. Capacitance

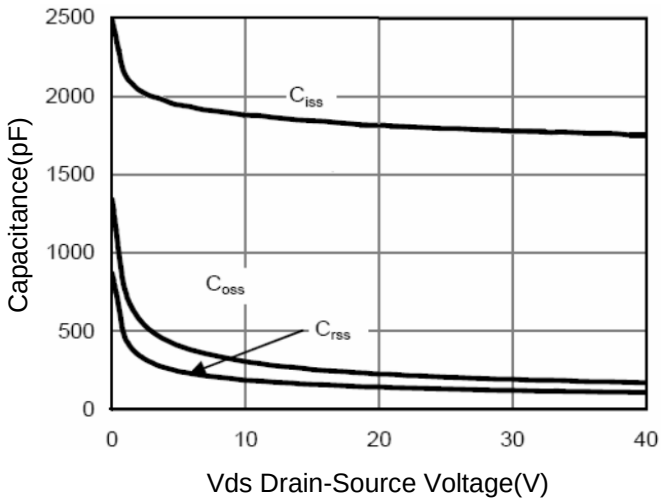
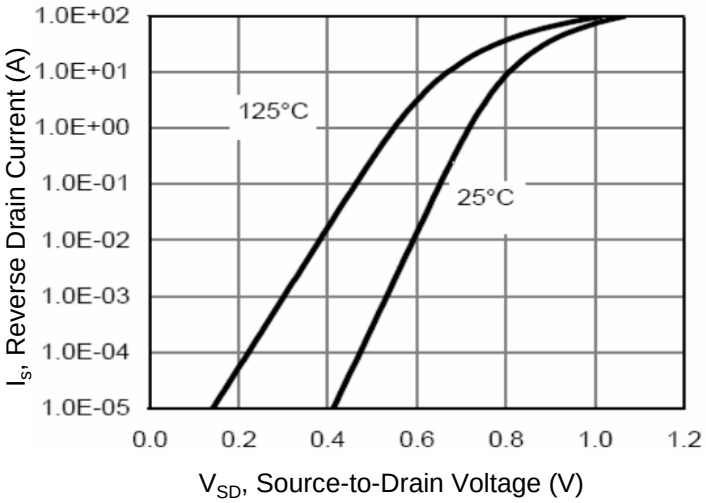


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

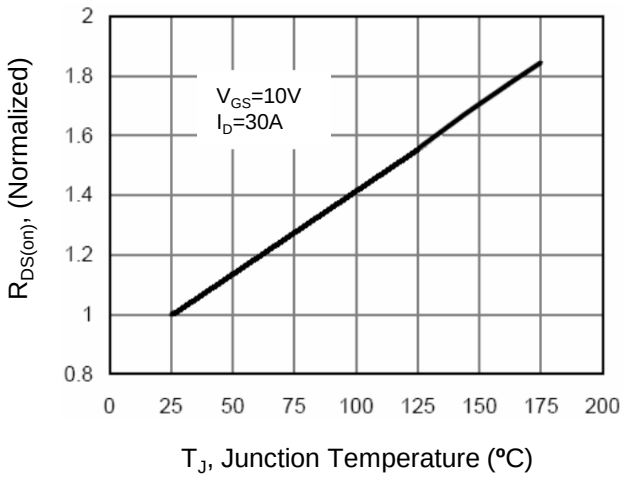


Figure 8. Safe Operation Area

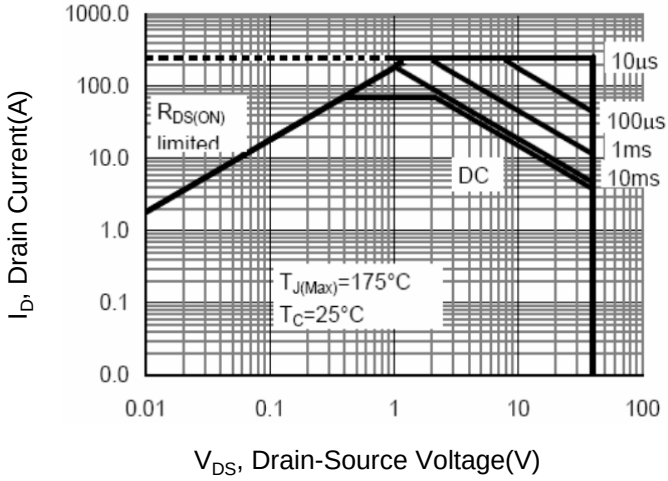
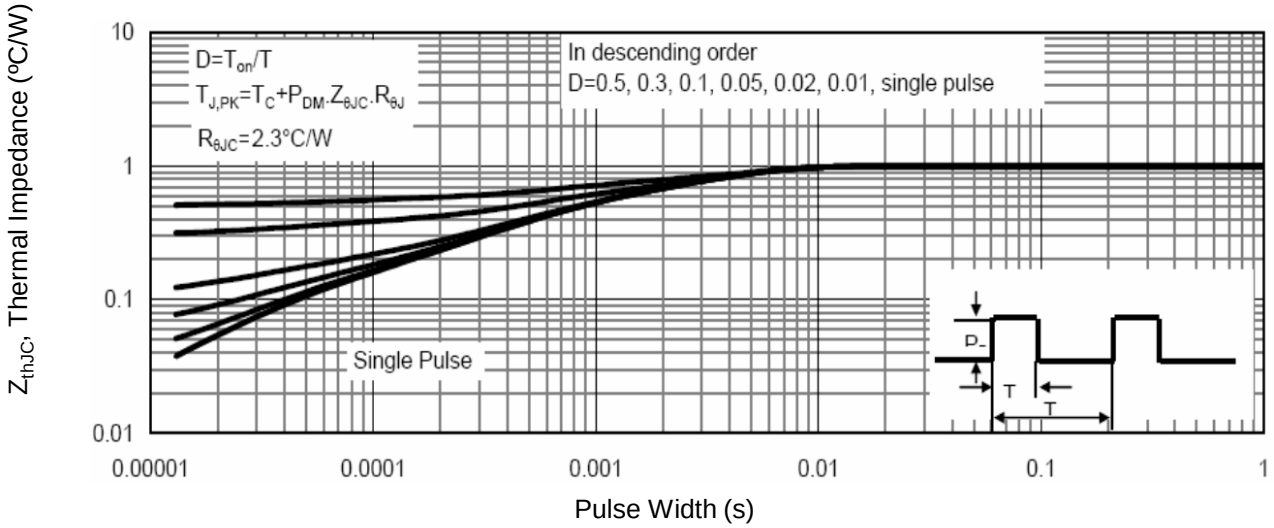
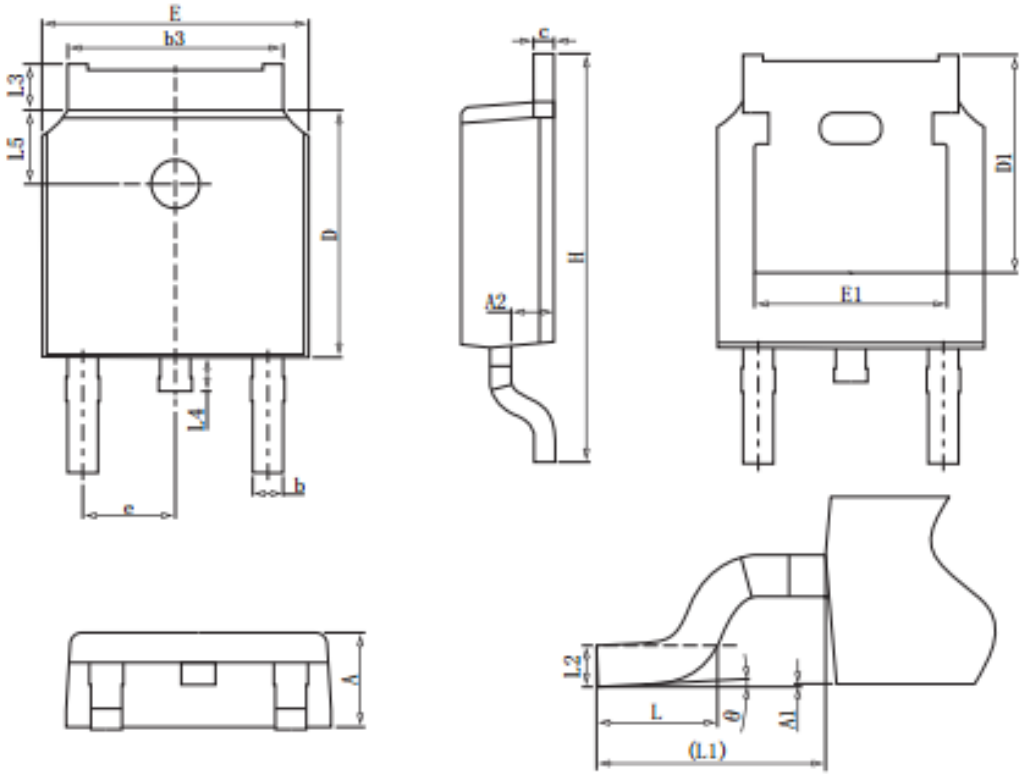


Figure 9. Normalized Maximum Transient Thermal Impedance



TO-252 Package Information



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	2.2	2.3	2.4
A1	0		0.2
A2	0.97	1.07	1.17
b	0.68	0.78	0.9
b3	5.2	5.33	5.5
c	0.43	0.53	0.63
D	5.98	6.1	6.22
D1	5.30REF		
E	6.4	6.6	6.8
E1	4.63		
e	2.286BSC		
H	9.4	10.1	10.5
L	1.38	1.5	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88		1.28
L4	0.5		1
L5	1.65	1.8	1.95
θ	0°		8°

Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb device	245℃±5℃	5sec±1sec
Pb-Free device	260℃+0/-5℃	5sec±1sec

This integrated circuit can be damaged by ESD UniverChip Corporation recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedure can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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