

NVT150N06C

Silicon 60V N-Channel MOSFET



VOLTAGE

60 Volts

CURRENT

150.00 Amperes

TO-220AB

FEATURES

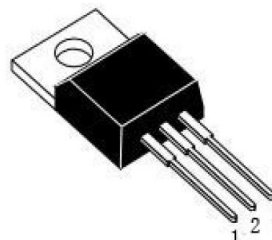
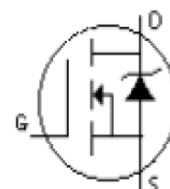
- High-Speed Switching
- Low RDS(ON)
- Low Gate Charge
- RoHS and Halogen-Free Compliant
- 100% UIS and RG Tested

APPLICATIONS

- Synchronous Rectification
- Industrial and Motor Drive
- DC/DC and AC/DC Converters
- Power Tools
- BMS

Product Summary

V_{DS}	60V
$R_{DS(on)}@10V$	3m Ω
I_D	150A



Gate:1, Drain:2, Source:3

Absolute maximum ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	60	V
Gate-Source voltage	V_{GS}	± 20	V
Continuous drain current TC = 25°C (Note 1)	I_D	150	A
TC = 100°C (Note 1)		105	
Drain Current-Pulsed	I_{DM}	550	A
Power dissipation	P_D	105	W
Avalanche energy, single pulse (Note 2)	E_{AS}	600	mJ
Operating junction	T_j	150	°C
storage temperature	T_{stg}	-55~150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.58	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	60	

Note: 1.Ensure that the channel temperature does not exceed 150°C.

2.VDD=50V, Tch= 25°C(initial), L=0.5mH, Rg=25 Ω .



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Electrical characteristics (TA = 25 °C, unless otherwise noted)

■ Static Characteristic

Parameter	Symbol	TEST CONDITION	Value			Unit
			Min.	Typ.	Max.	
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.5	2.8	3.5	V
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	3.0	3.5	m Ω
		$T_j=125^\circ C$	-	5.5	-	

■ Dynamic Characteristic

Input Capacitance	C_{iss}	$V_{DS}=35V, V_{GS}=0V, f=1MHz$	-	3850	-	pF
Output Capacitance	C_{oss}		-	1350	-	
Reverse Transfer Capacitance	C_{rss}		-	100	-	
Gate Resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	-	1.2	-	Ω

■ Switching Paramters

Gate Total Charge	Q_g	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	-	65	-	nC
Gate-Source charge	Q_{gs}		-	20	-	
Gate-Drain charge	Q_{gd}		-	7	-	

■ Source-Drain Characteristics

Body Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=10A$	-	0.8	1.2	v
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Typical Performance Characteristics

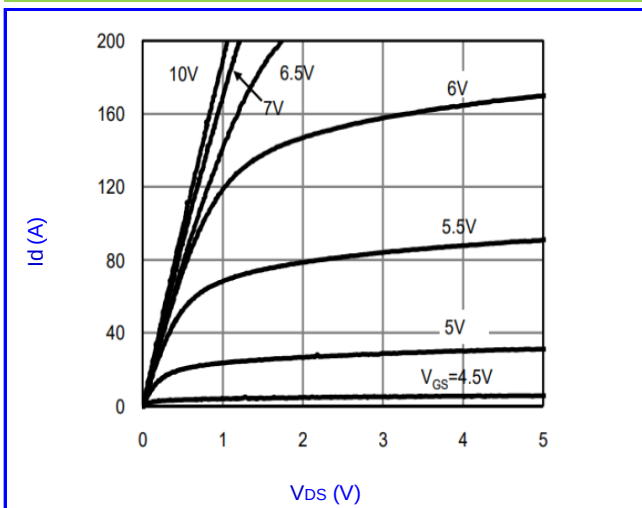


Fig 1: Output Characteristics

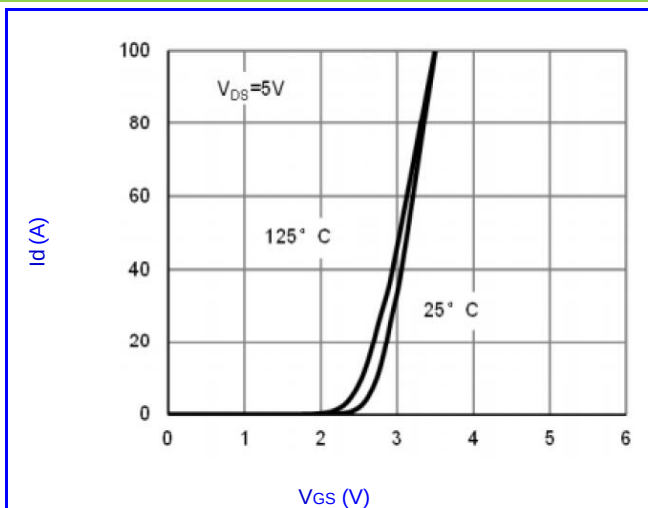


Fig 2: Transfer Characteristics

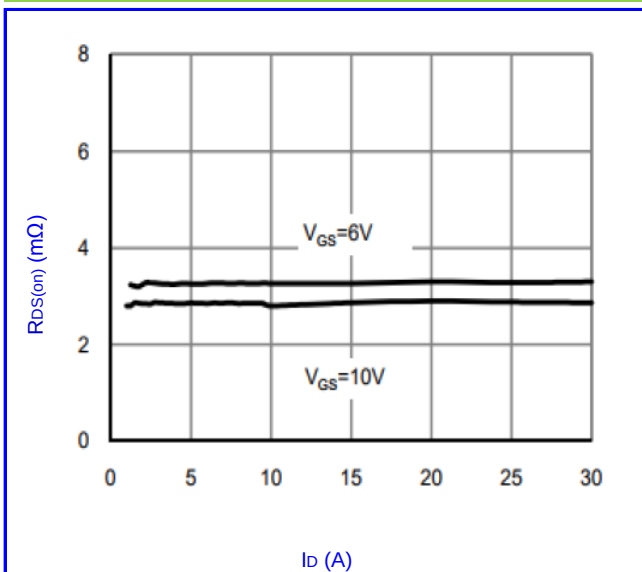


Fig 3: Rds(on) vs Drain Current and Gate Voltage

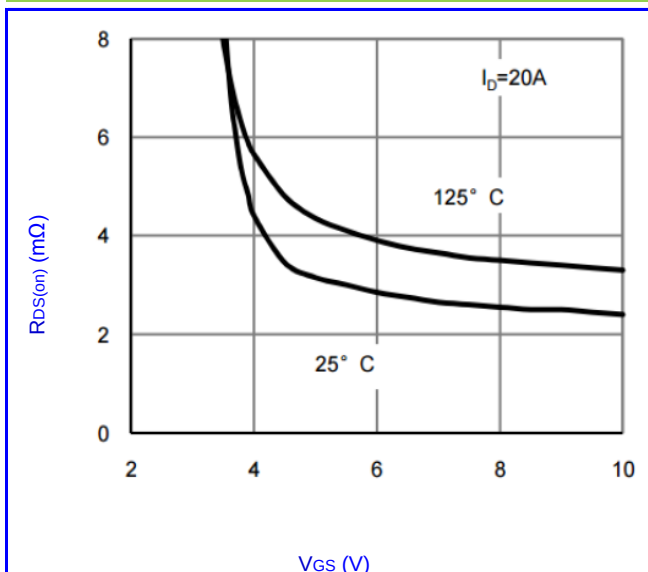


Fig 4: Rds(on) vs Gate Voltage

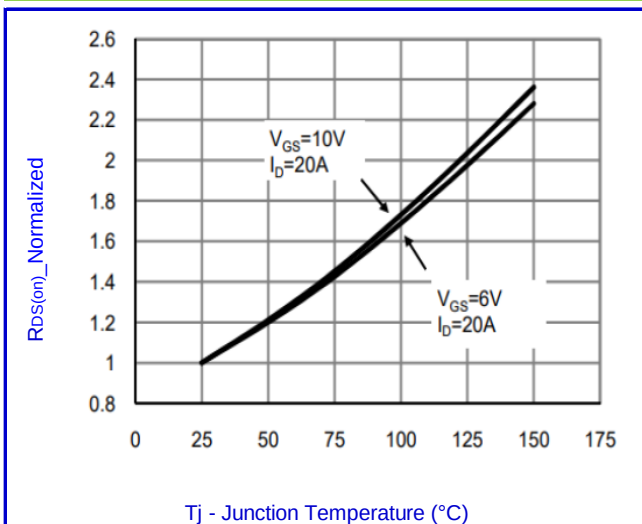


Fig 5: Rds(on) vs. Temperature

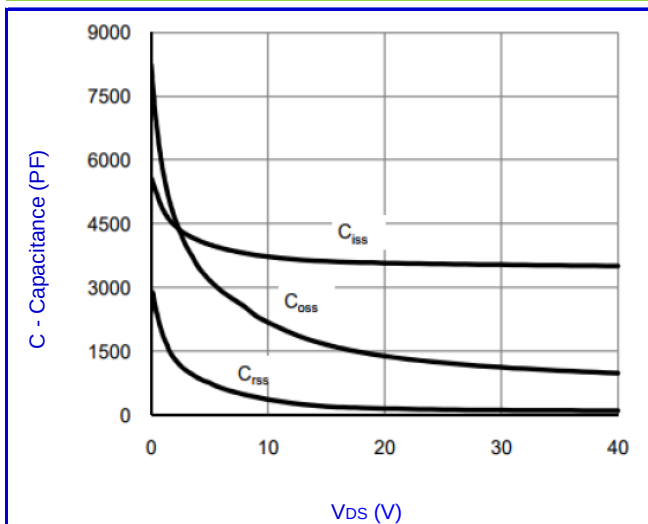


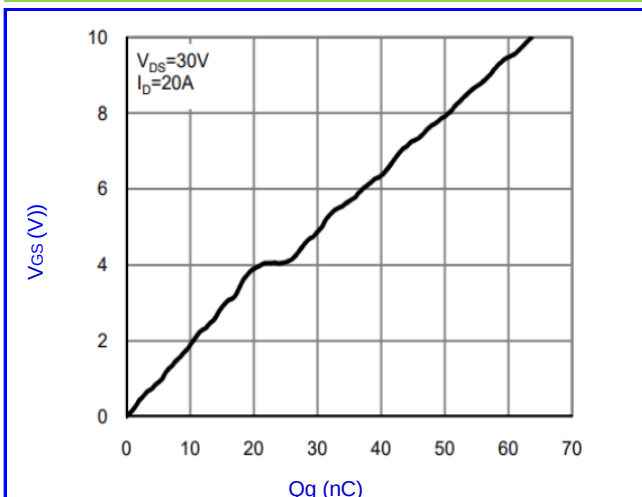
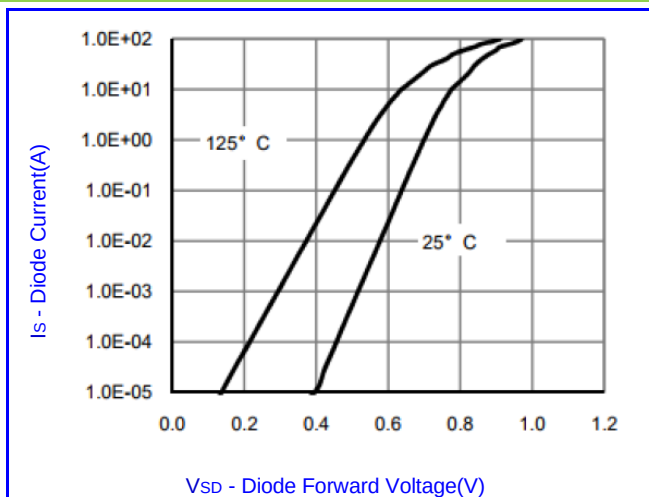
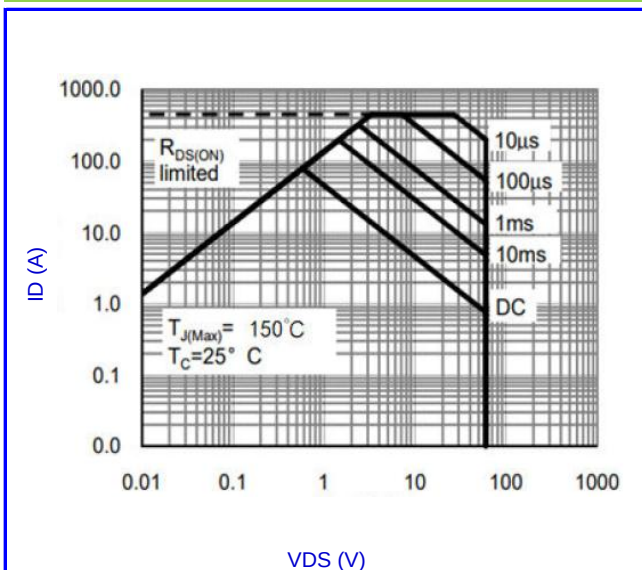
Fig 6: Capacitance Characteristics

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Typical Performance Characteristics



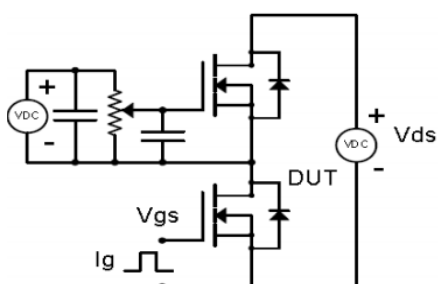
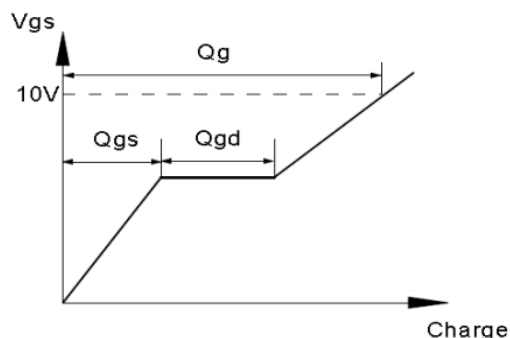
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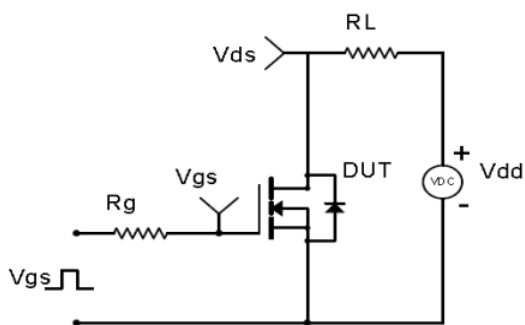
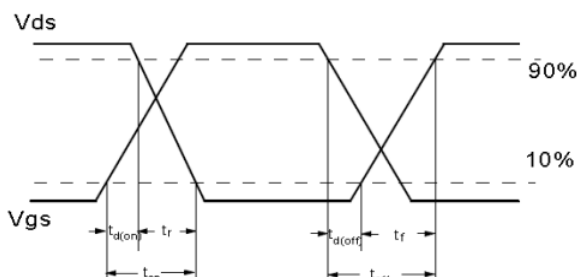


Test Circuit & Waveform

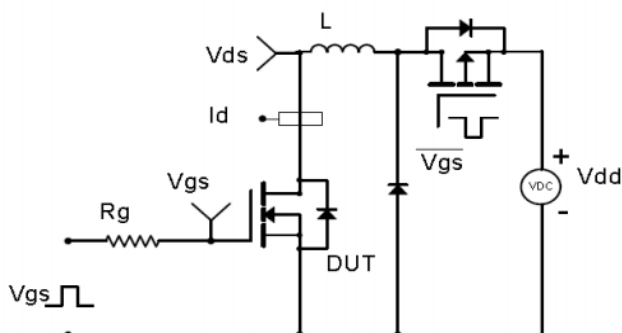
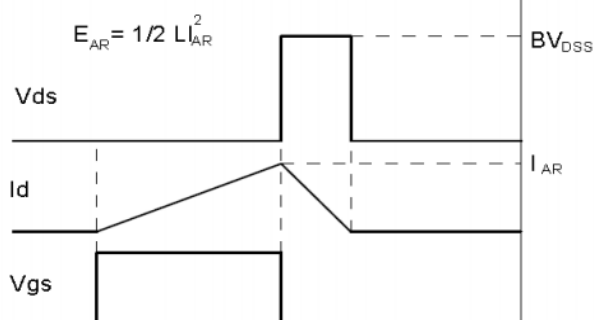
Gate Charge Test Circuit & Waveform



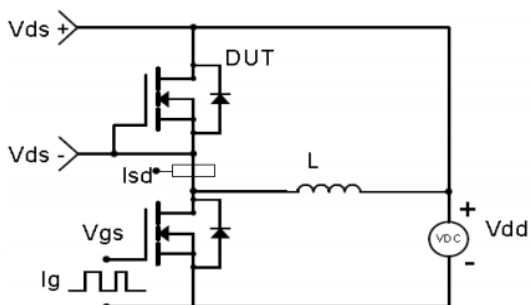
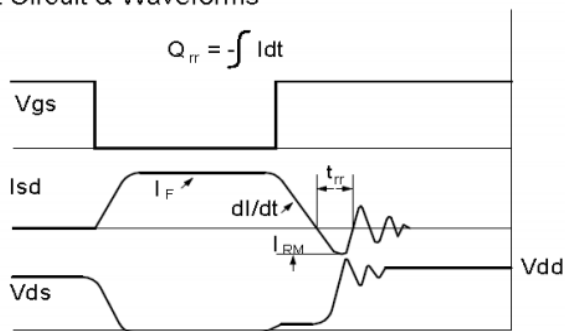
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

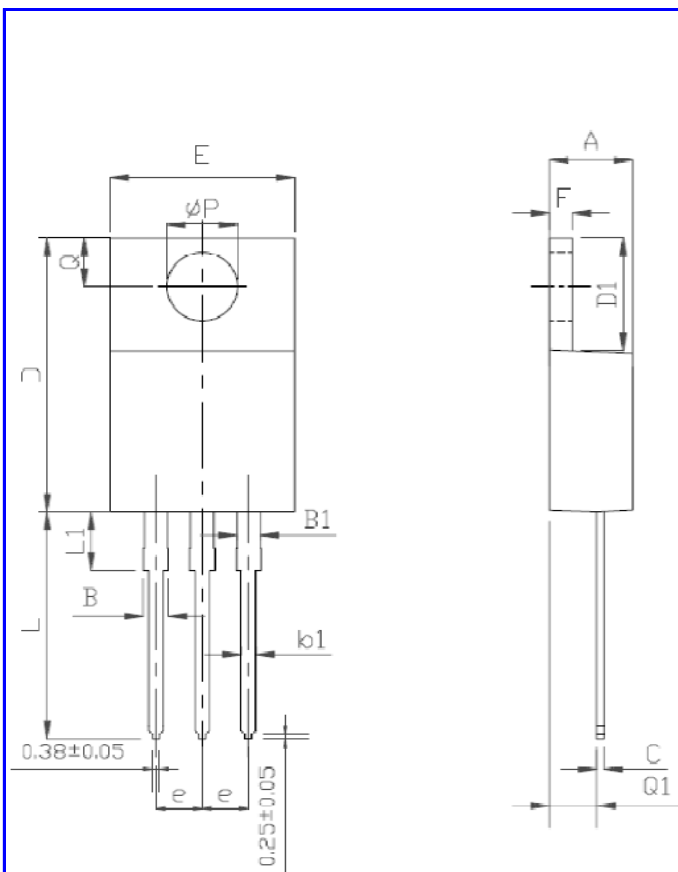


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OUTLINE DRAWINGS: TO-220-3L



OUTLINE DIMENSIONS			
DIM	MILLIMETERS		
	MIN.	TYP.	MAX.
A	4.00	-	4.80
B	1.20	-	1.40
B1	1.00	-	1.40
b1	0.75	-	0.95
c	0.40	-	0.55
D	15.00	-	16.50
D1	5.90	-	6.90
E	9.90	-	10.70
e	2.44	2.54	2.64
F	1.10	-	1.40
L	12.50	-	14.50
L1	3.00	3.50	4.00
ΦP	3.70	3.80	3.90
Q	2.50	-	3.00
Q1	2.00	-	2.90

Packing Information

Product code	Pack	Box Size L×W×H(mm)	Quantity(pcs/box)	Carton Size L×W×H(mm)	Quantity(box/carton)
NVT150N06C TO-220AB	P/T	550*150*40	1000	580*230*175	5

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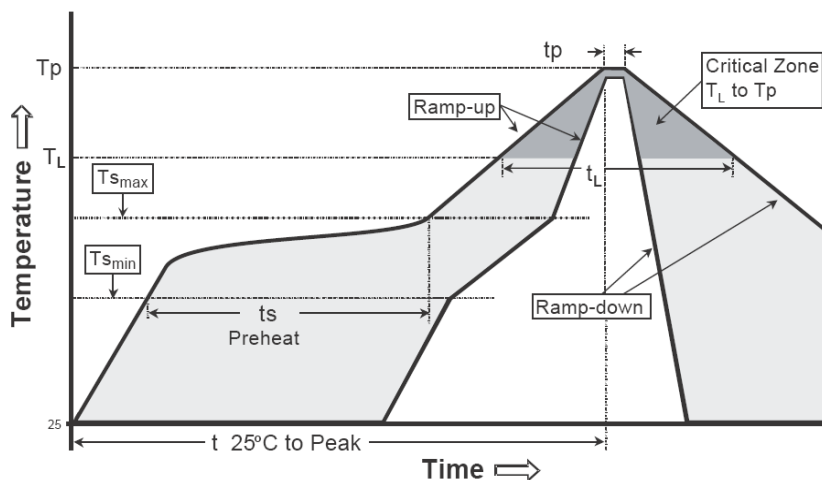
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OUTLINE DRAWINGS: TO-220-3L

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat -Temperature Min(TS min) -Temperature Max(TS max) -Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (TL) - Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.



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