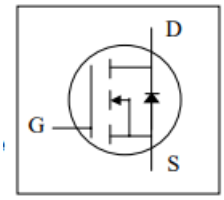
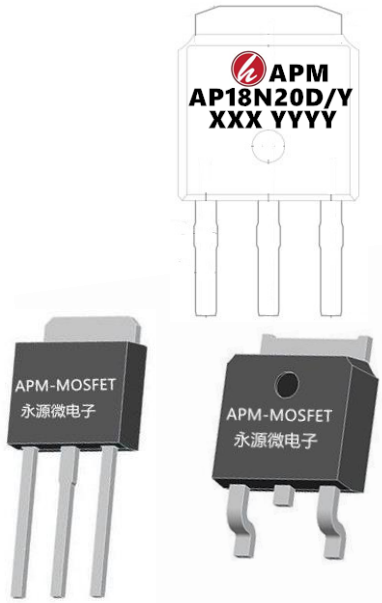
AP18N20D/Y

200V N-Channel Enhancement Mode MOSFET

Description

The AP18N20D/Y is silicon N-channel Enhanced VDMOSFETs, is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.





General Features

VDS =200V,ID =18A

RDS(ON) <0.15Ω@ VGS=10V

Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP18N20D	TO-252-3L	A18N20D XXX YYYY	2500
AP18N20Y	TO-251-3L	AP18N20Y XXX YYYY	4000

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage (VGS = 0V)	VDSS	200	V
Continuous Drain Current	ID	18	A
Pulsed Drain Current	IDM	72	A
Gate-Source Voltage	VGSS	±20	V
Single Pulse Avalanche Energy	EAS	340	mJ
Avalanche Current	IAR	15	A
Repetitive Avalanche Energy	EAR	8.3	mJ
Power Dissipation (TC = 25ºC)	PD	104	W
Operating Junction and Storage Temperature Range	TJ, Tstg	-55~+150	ºC
Thermal Resistance, Junction-to-Case	RthJC	1.2	ºC/W
Thermal Resistance, Junction-to-Ambient	RthJA	60	

200V N-Channel Enhancement Mode MOSFET

Electrical Characteristics at T_j=25 ℃ unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V(BR)DSS	V_{GS} = 0V, I_D = 250μA	200	--	--	V
Zero Gate Voltage Drain Current	IDSS	V_{DS} = 200V, V_{GS} = 0V, T_J = 25ºC	--	--	5	μA
		V_{DS} = 160V, V_{GS} = 0V, T_J = 125ºC	--	--	100	
Gate-Source Leakage	IGSS	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	VGS(th)	V_{DS} = V_{GS}, I_D = 250μA	1.2	1.6	2.5	V
Drain-Source On-Resistance (Note3)	RDS(on)	V_{GS} = 10V, I_D = 9A	--	0.12	0.15	Ω
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz	--	1318	--	pF
Output Capacitance	C_{oss}		--	180	--	
Reverse Transfer Capacitance	C_{rss}		--	75	--	
Total Gate Charge	Q_g	V_{DD} = 160V, I_D = 18A, V_{GS} = 10V	--	41	--	nC
Gate-Source Charge	Q_{gs}		--	5.5	--	
Gate-Drain Charge	Q_{gd}		--	19.5	--	
Turn-on Delay Time	td(on)	V_{DD} = 100V, I_D = 18A, R_G = 25 Ω	--	24	--	ns
Turn-on Rise Time	t_r		--	45	--	
Turn-off Delay Time	td(off)		--	101	--	
Turn-off Fall Time	t_f		--	95	--	
Continuous Body Diode Current	I_S	T_C = 25 ºC	--	--	18	A
Pulsed Diode Forward Current	ISM		--	--	72	
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 18A, V_{GS} = 0V	--	--	1.4	V
Reverse Recovery Time	t_{rr}	V_{GS} = 0V,I_S = 18A, di_F/dt =100A /μs	--	230	--	ns
Reverse Recovery Charge	Q_{rr}		--	1.8	--	μC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS} = 15A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25 ºC
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Typical Characteristics

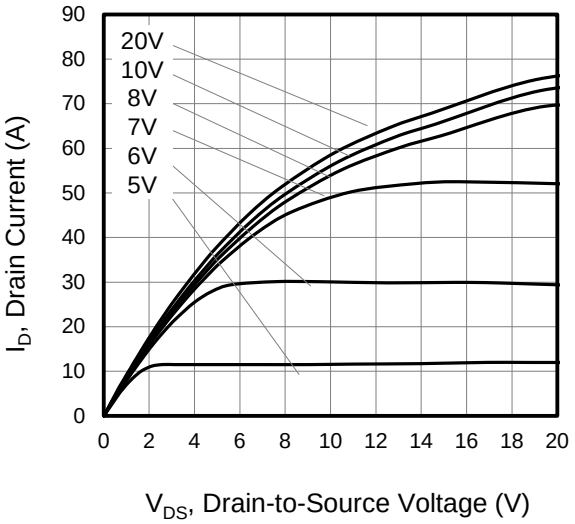


Figure 1. Output Characteristics (T_J = 25ºC)

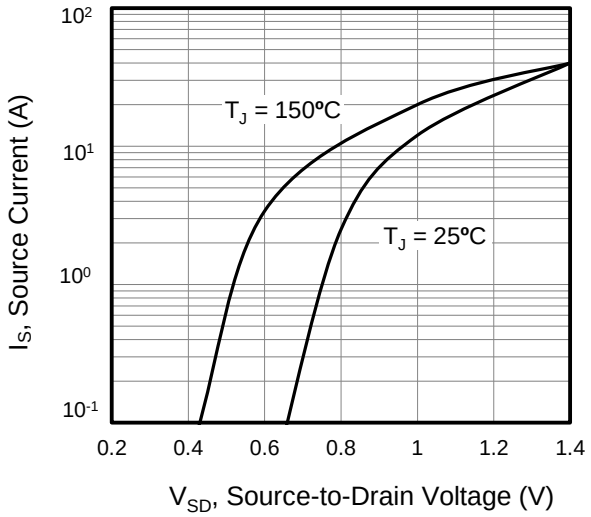


Figure 2. Body Diode Forward Voltage

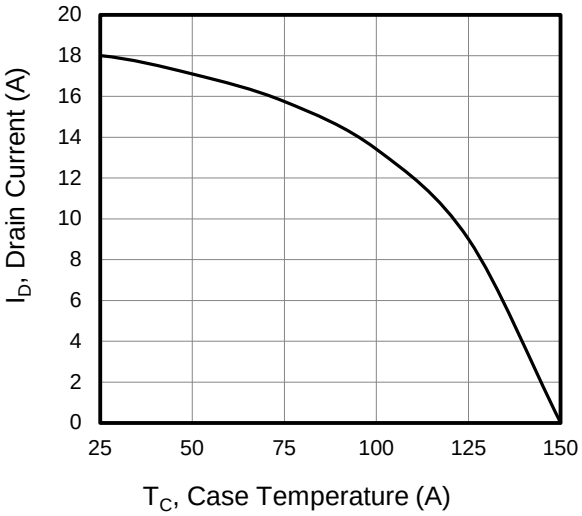


Figure 3. Drain Current vs. Temperature

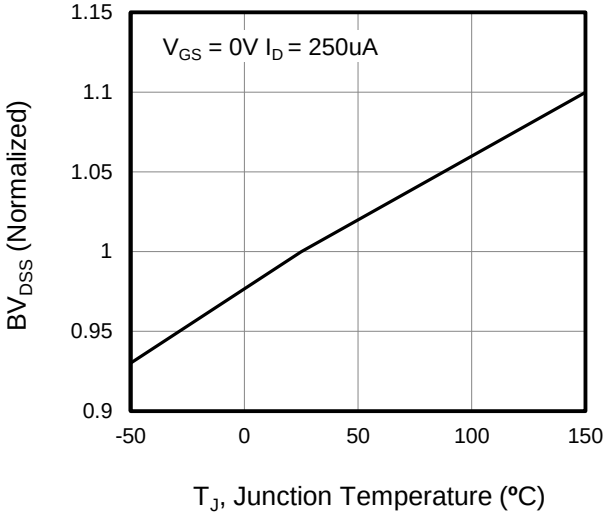


Figure 4. BV_{DSS} Variation vs. Temperature

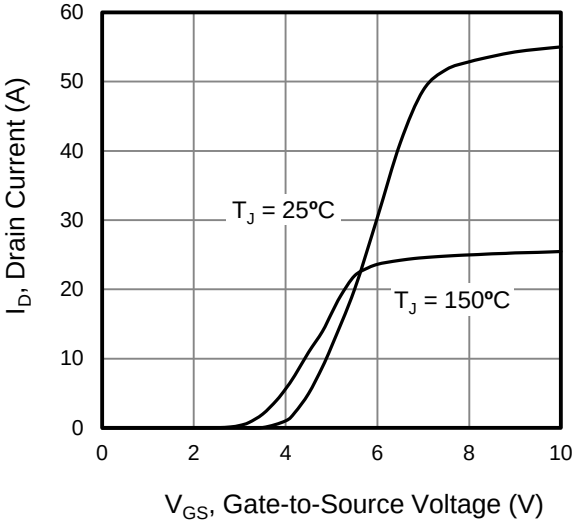


Figure 5. Transfer Characteristics

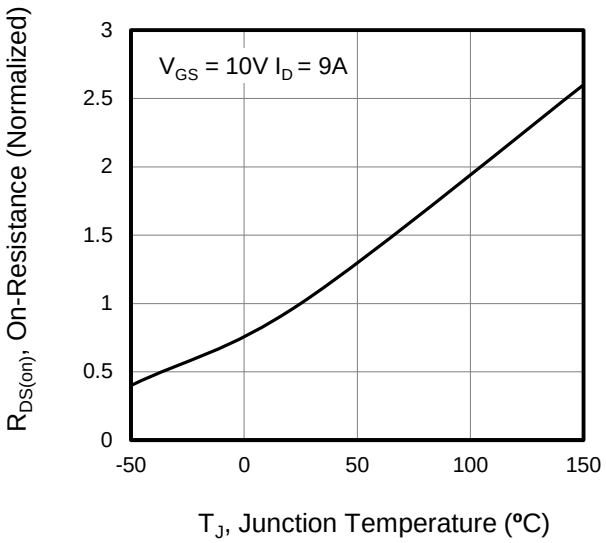


Figure 6. On-Resistance vs. Temperature

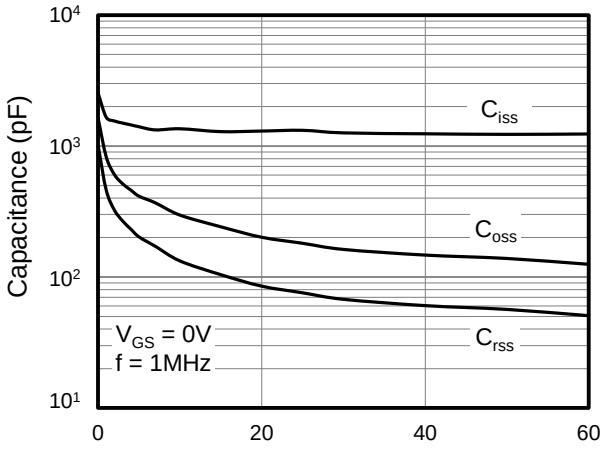


Figure 7. Capacitance

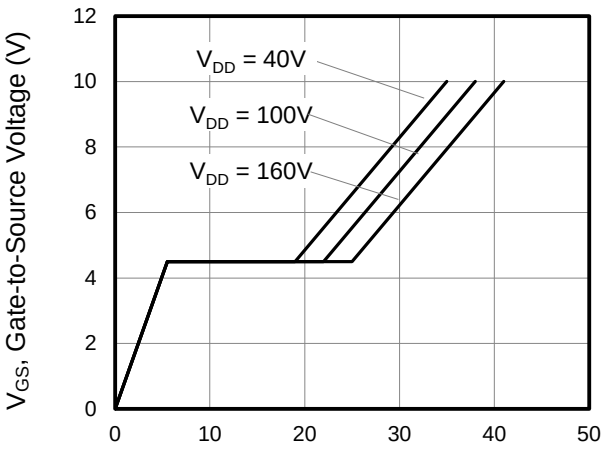


Figure 8. Gate Charge

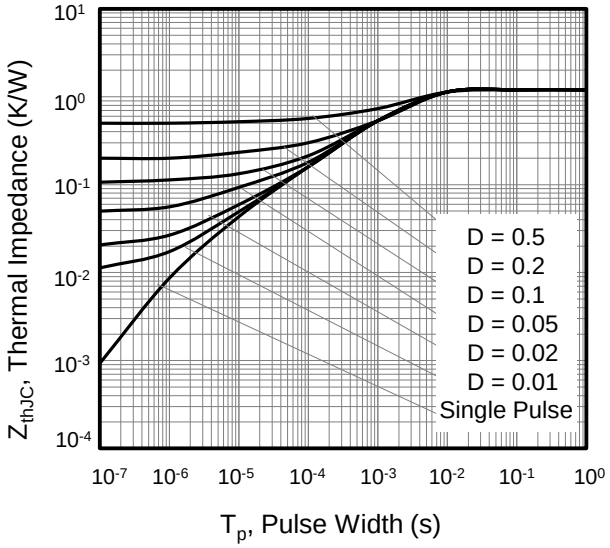


Figure 10. Transient Thermal Impedance

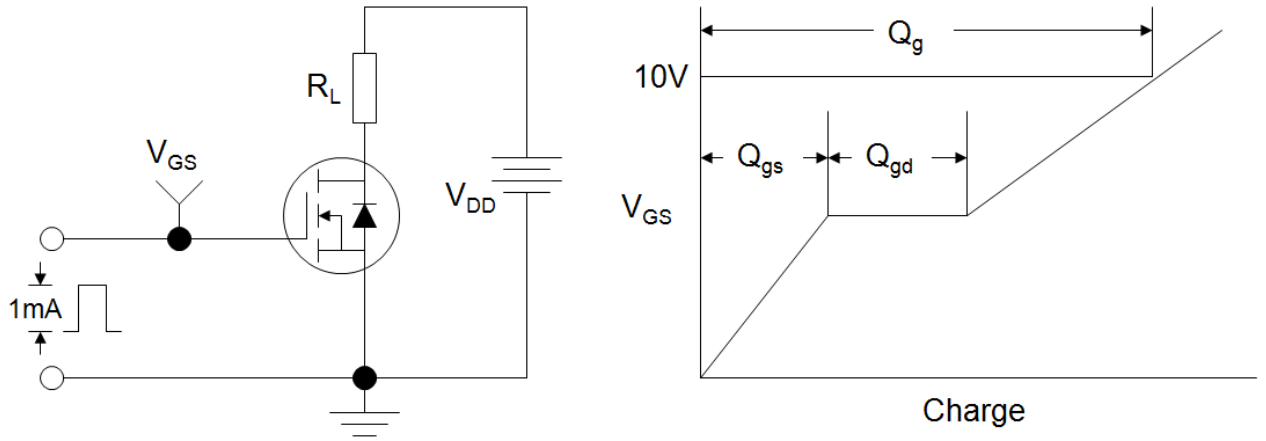


Figure A：Gate Charge Test Circuit and Waveform

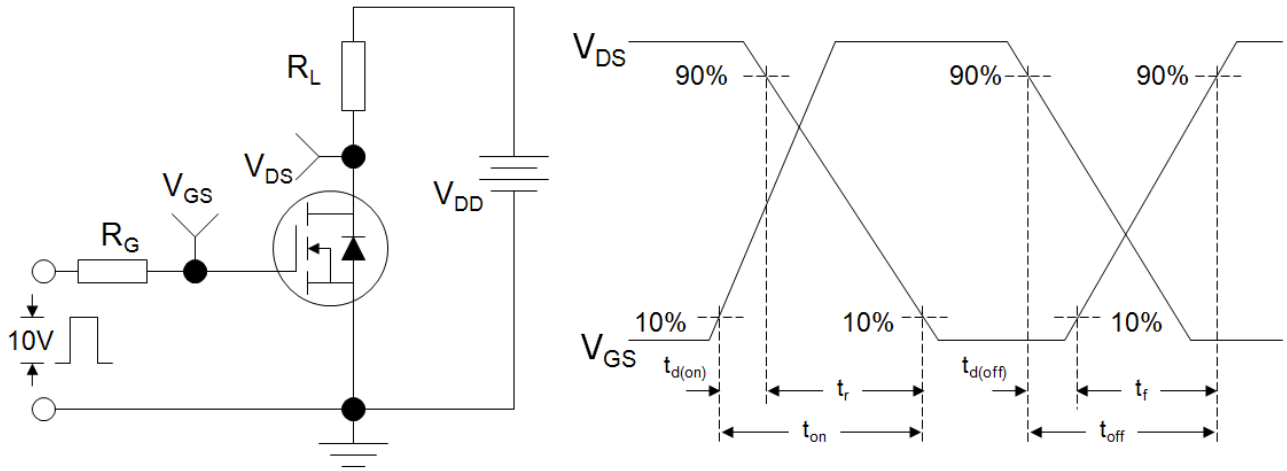


Figure B：Resistive Switching Test Circuit and Waveform

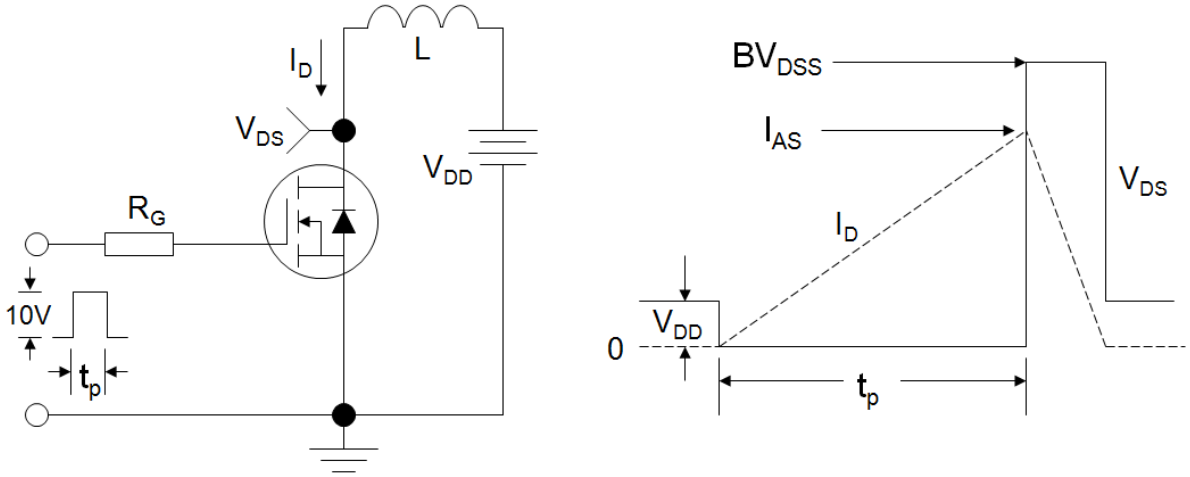
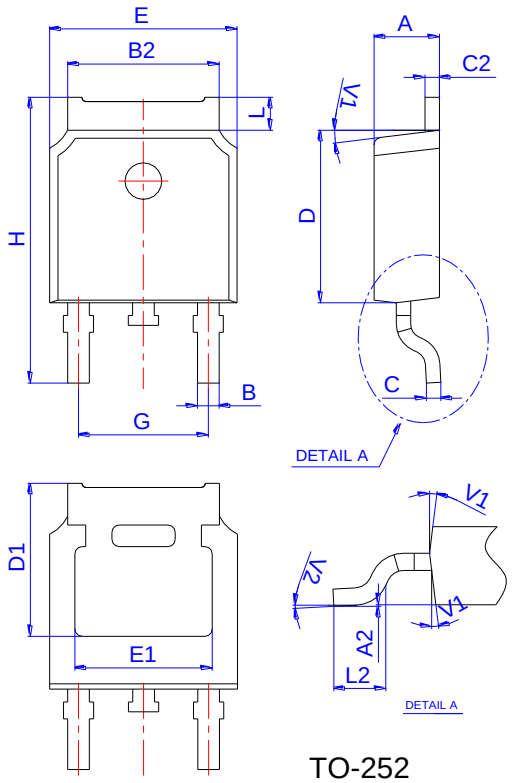


Figure C：Unclamped Inductive Switching Test Circuit and Waveform

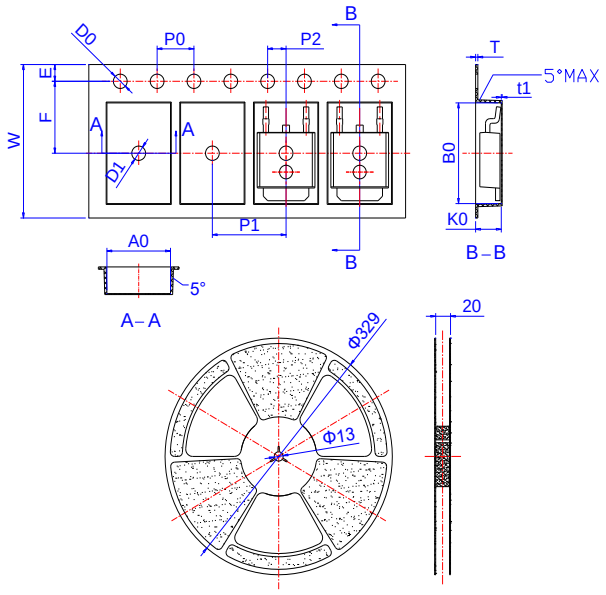
Package Mechanical Data



TO-252

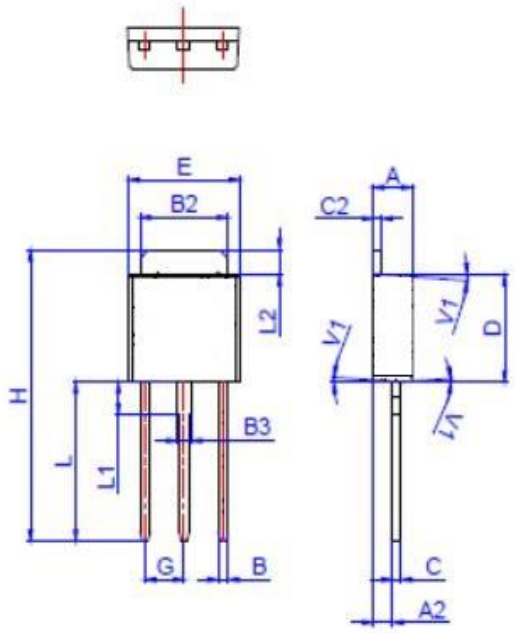
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Spectification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

Package Mechanical Data



TO-251

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.20		2.40	0.086		0.095
A2	0.90		1.20	0.035		0.047
B	0.55		0.65	0.022		0.026
B2	5.10		5.40	0.200		0.213
B3	0.76		0.85	0.030		0.033
C	0.45		0.62	0.018		0.024
C2	0.48		0.62	0.019		0.024
D	6.00		6.20	0.236		0.244
E	6.40		6.70	0.252		0.264
G		2.30			0.091	
H	16.0		17.0	0.630		0.669
L	8.90		9.40	0.350		0.370
L1	1.80		1.90	0.071		0.075
L2	1.37		1.50	0.054		0.059
V1		4°			4°	

Package Information -TO-251

OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON (PCS)
TUBE	80	4,000	32,000

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