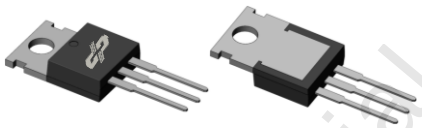
DP035N04PTL

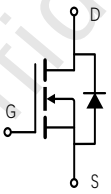
DPMOS N-MOSFET 40V, 3mΩ, 100A

Product Summary

Part #	V_{DS}	$R_{DS(on).typ}$ (@V_{GS}=10V)	$R_{DS(on).typ}$ (@V_{GS}=4.5V)	I_D
DP035N04PTL	40V	3mΩ	3.6mΩ	100A

TO-220





100% Avalanche Tested

100% Rg Tested

Features

- Uses advanced Trench MOSFET technology
- Extremely low $R_{DS(on)}$/High Speed Power Switching
- Excellent Q_gx$R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria

Applications

- Motor control and drive
- Power Management Switches
- High-frequency switching and synchronous rectification

Package Marking and Ordering Information

Part #	Marking	Package	Packing
DP035N04PTL	035N04PTL	TO-220	Tube

Halogen-Free

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	40	V
Continuous drain current T_C = 25°C T_C = 25°C (Package limit) T_C = 100°C	I_D	 161 100 102	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	400	A
Avalanche energy, single pulse (L=0.1mH, Rg=25)[1]	E_{AS}	157	mJ
Gate-Source voltage	V_{GS}	±25	V
Power dissipation (T_C = 25°C)	P_{tot}	160	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

[1].EAS is tested at starting T_j = 25℃, V_{GS} = 10V.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.8	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	62	

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	40	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	1	1.5	2.2	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=40V,V_{GS}=0V T_j=25°C
		-	-	100		T_j=150°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±25V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	3.0	3.6	mΩ	T_j=25°C V_{GS}=10V, I_D=30A
		-	3.6	4.7	mΩ	V_{GS}=4.5V, I_D=20A
Gate resistance	R_g	-	-	3.0	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz
Transconductance[2]	g_{fs}	-	97	-	S	V_{DS}=5V,I_D=40A
Dynamic Characteristic[2]						
Input Capacitance	C_{iss}	-	6226	-	pF	V_{GS}=0V, V_{DS}=20V, f=1MHz
Output Capacitance	C_{oss}	-	521	-		
Reverse Transfer Capacitance	C_{rss}	-	342	-		
Gate Total Charge@V_{GS}=10V	Q_g	-	105	-	nC	V_{GS}=10V, V_{DS}=20V, I_D=30A, f=1MHz
Gate Total Charge@V_{GS}=4.5V	Q_g	-	53	-		
Gate-Source charge	Q_{gs}	-	18	-		
Gate-Drain charge	Q_{gd}	-	19	-		
Turn-on delay time	$t_{d(on)}$	-	16	-	ns	V_{GS}=10V, V_{DD}=20V, R_{G_ext}=2.7Ω,ID=20A
Rise time	t_r	-	29	-		
Turn-off delay time	$t_{d(off)}$	-	77	-		
Fall time	t_f	-	19	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	-	1.2	V	V_{GS}=0V,I_{SD}=40A
Diode continuous forward current	I_s	-	-	100	A	T_C = 25°C
Diode pluse current	$I_{s\ pluse}$	-	-	400	A	T_C = 25°C
Body Diode Reverse Recovery Time[2]	t_{rr}	-	25	-	ns	I_F=30A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge[2]	Q_{rr}	-	18	-	nC	

[2]. Defined by design. Not subject to production test

Typical Performance Characteristics

Fig 1: Output Characteristics

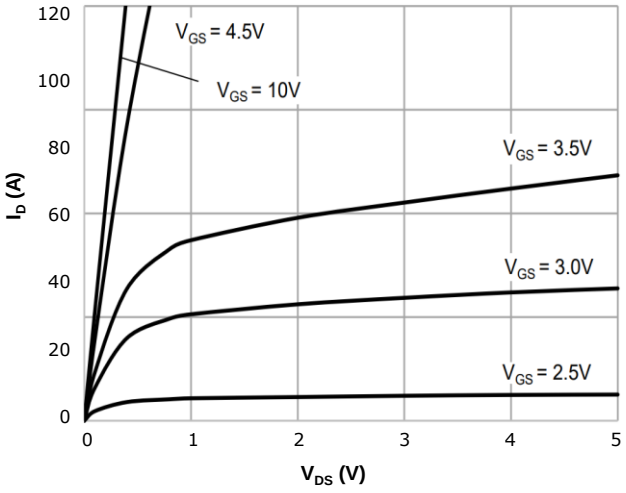


Fig 2: Transfer Characteristics

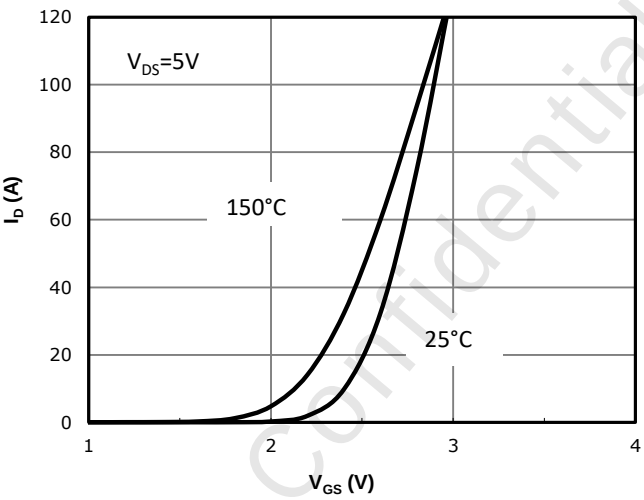


Fig 3: Rds(on) vs Drain Current and Gate Voltage

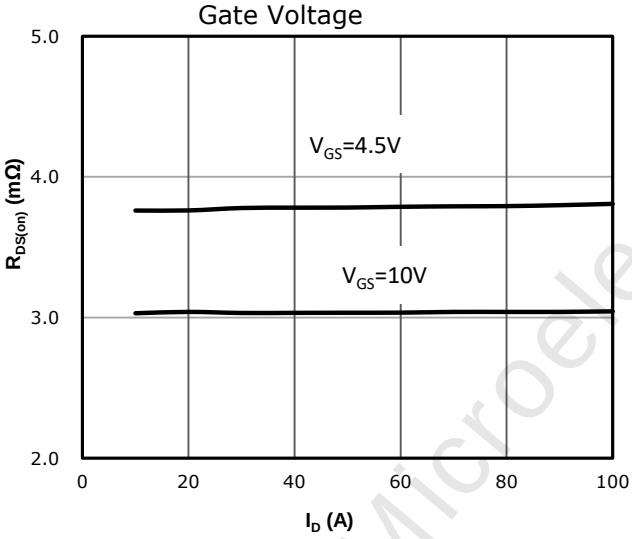


Fig 4: Rds(on) vs Gate Voltage

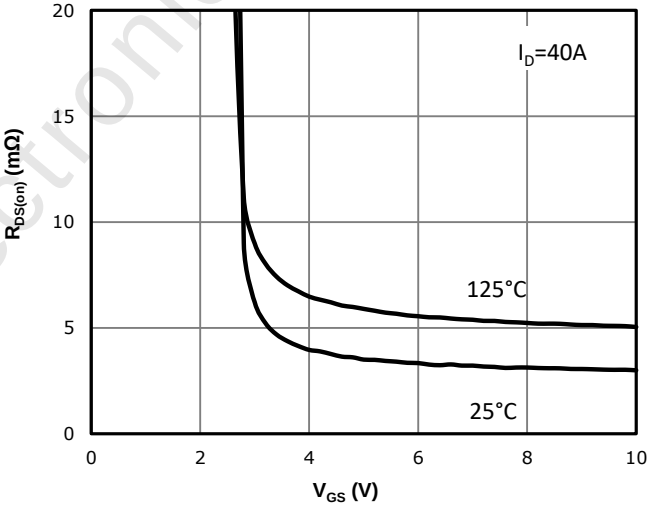


Fig 5: Rds(on) vs. Temperature

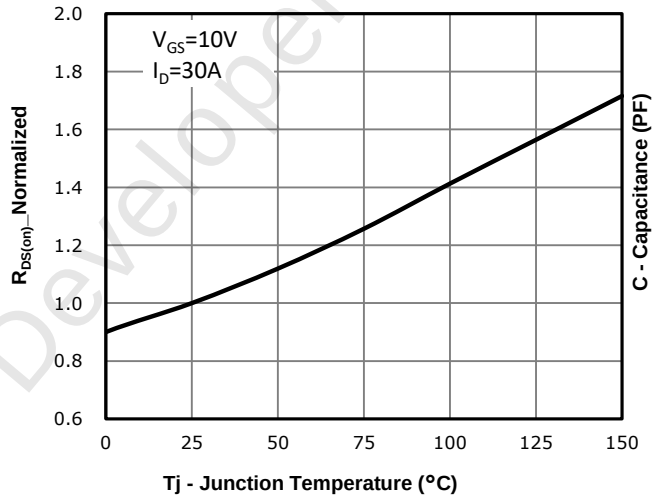


Fig 6: Capacitance Characteristics

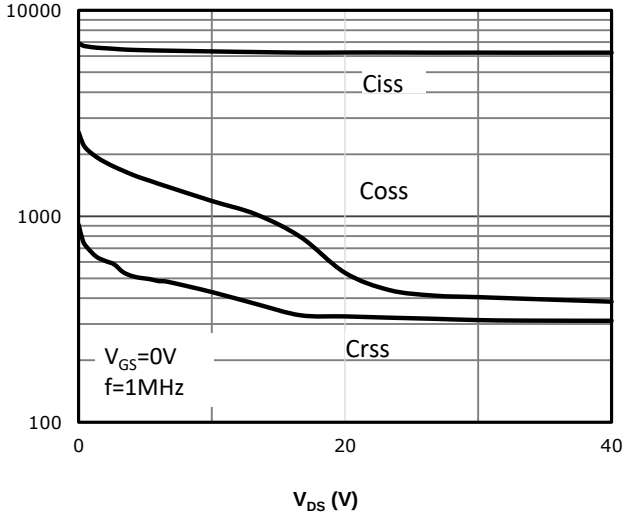


Fig 7: Gate Charge Characteristics

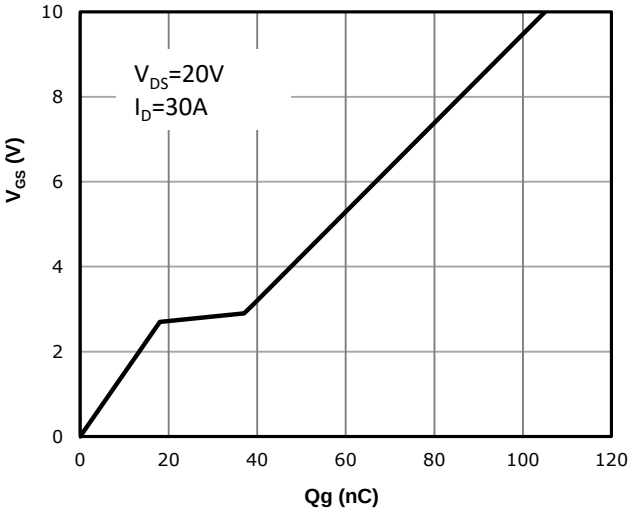


Fig 8: Body-diode Forward Characteristics

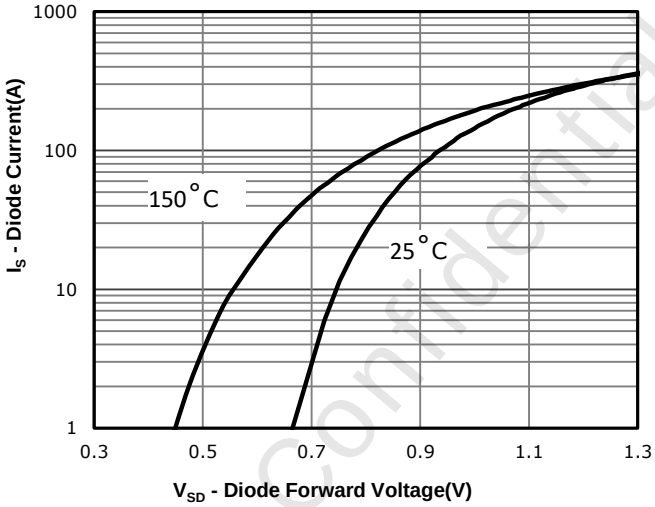


Fig 9: Power Dissipation

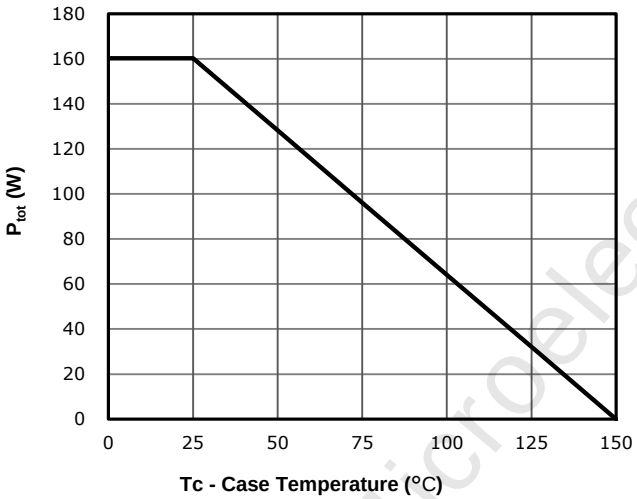


Fig 10: Drain Current Derating

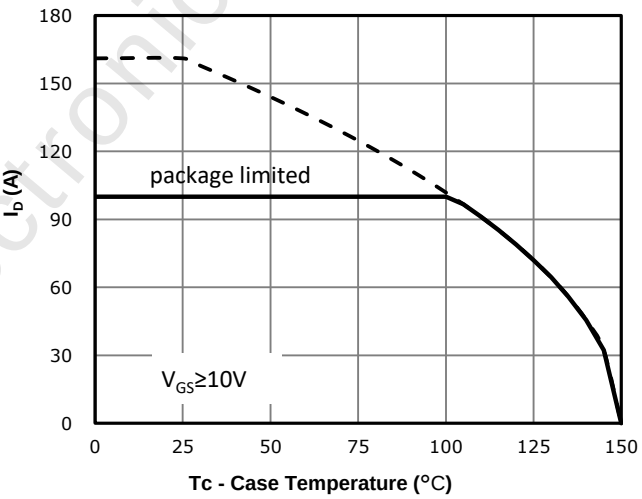


Fig 11: Safe Operating Area

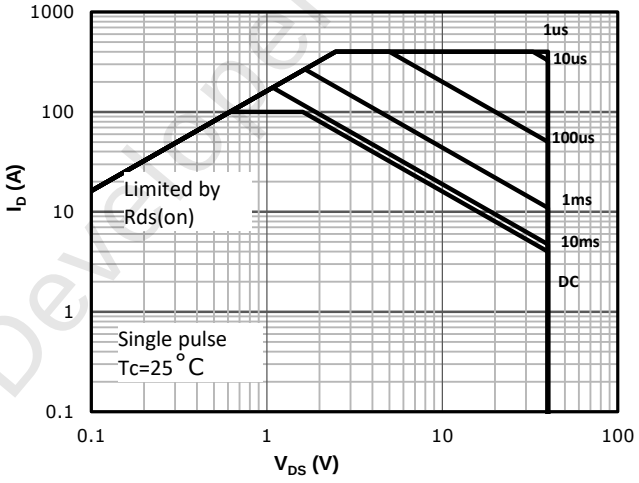
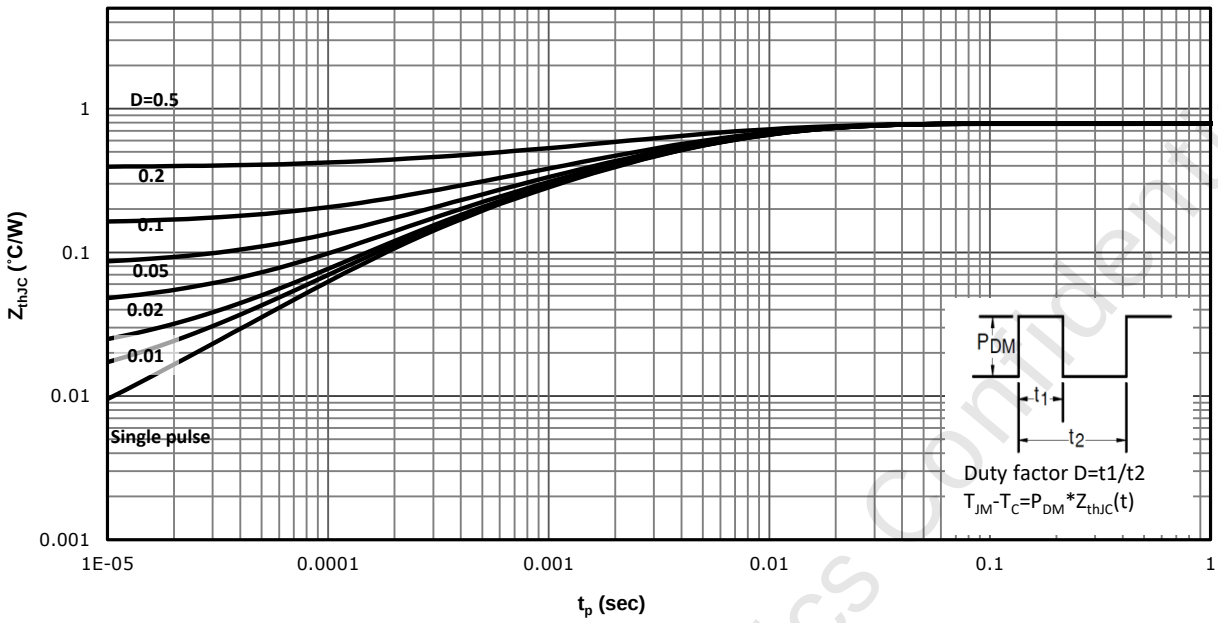
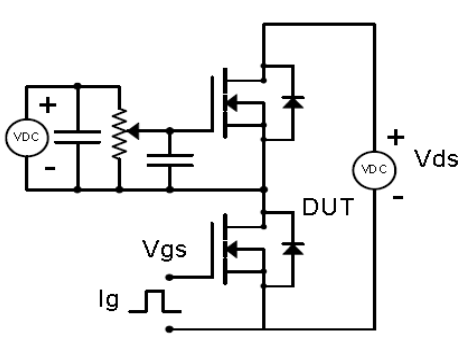


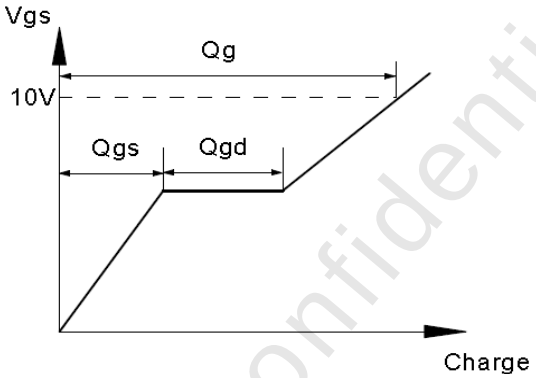
Fig 12: Max. Transient Thermal Impedance



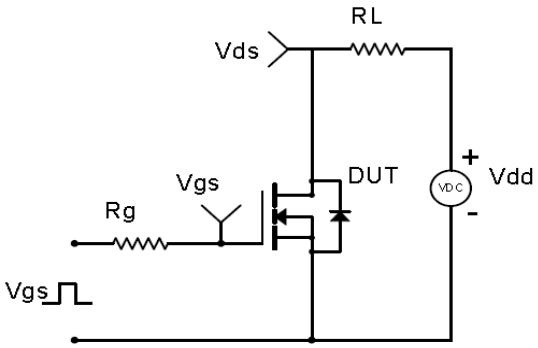
Test Circuit & Waveform

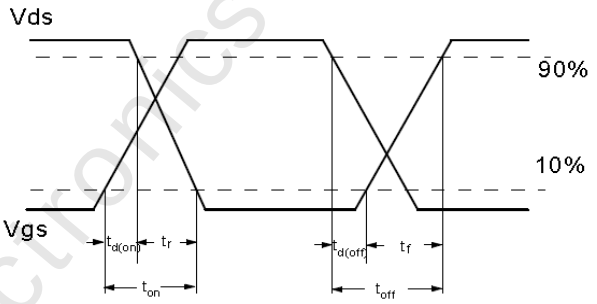
Gate Charge Test Circuit & Waveform



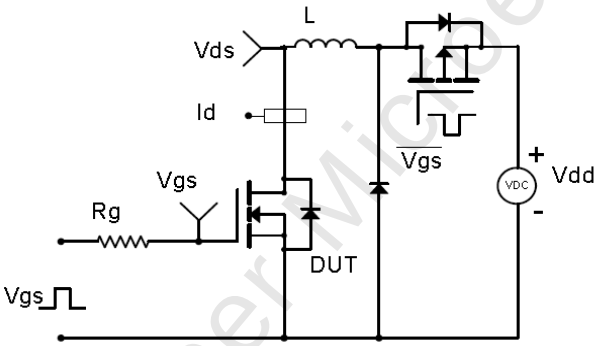


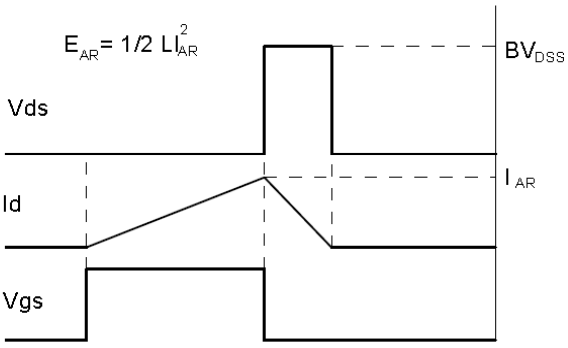
Resistive Switching Test Circuit & Waveforms



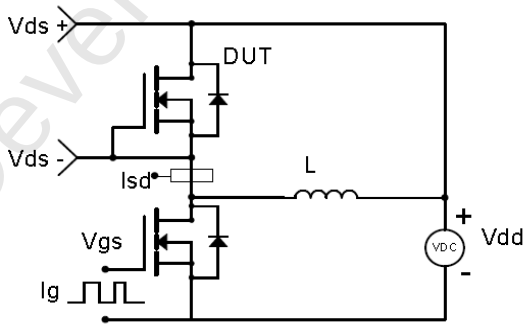


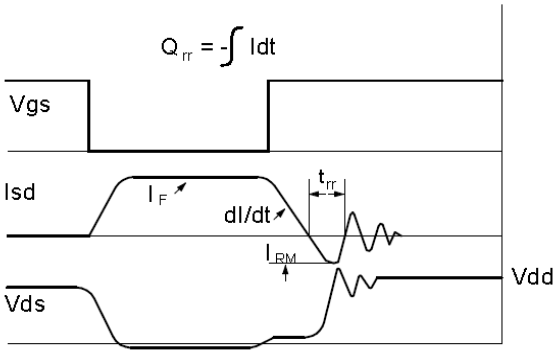
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



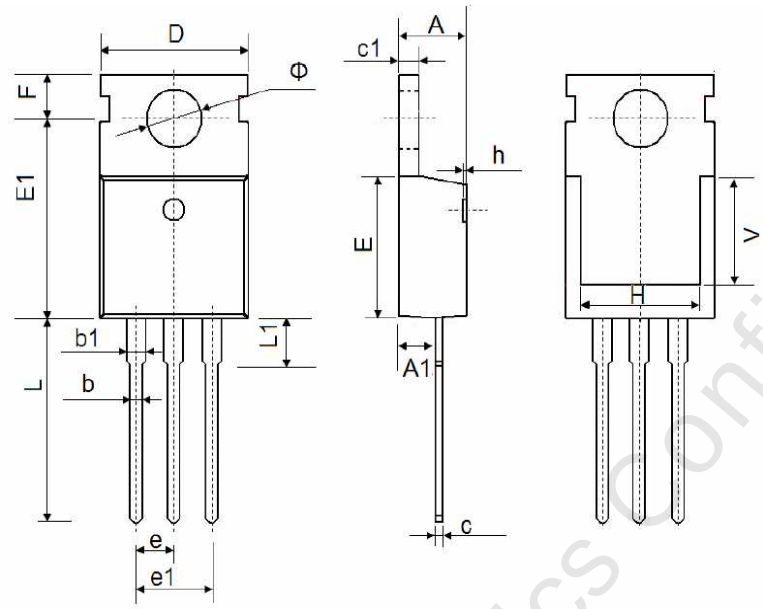


Diode Recovery Test Circuit & Waveforms



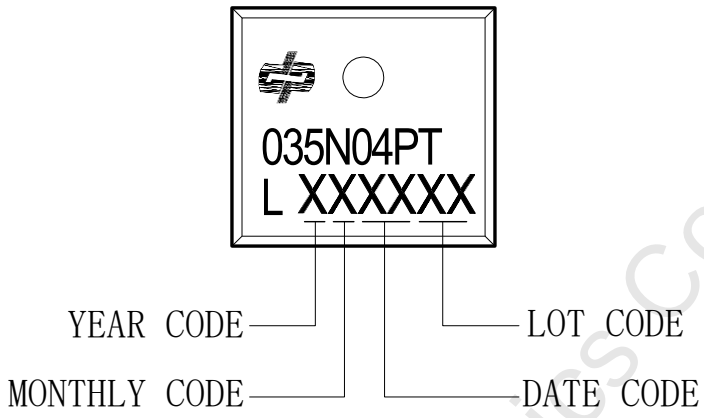


Package Outline: TO-220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.70	0.169	0.185
A1	2.25	2.55	0.089	0.100
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.33	0.65	0.013	0.026
c1	1.20	1.40	0.047	0.055
D	9.91	10.25	0.390	0.404
E	8.95	9.75	0.352	0.384
E1	12.65	12.95	0.498	0.510
e	2.54 BSC.		0.100 BSC.	
e1	4.98	5.18	0.196	0.204
F	2.65	2.95	0.104	0.116
H	7.90	8.10	0.311	0.319
h	0.00	0.30	0.000	0.012
L	12.90	13.40	0.508	0.528
L1	2.85	3.25	0.112	0.128
V	7.500 Ref.		0.295 Ref.	
Φ	3.400	3.800	0.134	0.150

Part Marking Information



Revision History

Revison	Major changes
1.0	Release for formal version

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