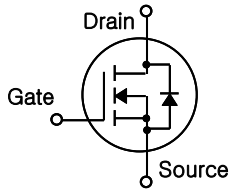
PFP160N10S/PFB160N10S

100V N-Channel MOSFET

BV_{DSS} = 100 V

$R_{DS(on)}$ = 5.8 mΩ

I_D = 152 A



TO-220

1.Gate 2. Drain 3. Source

D2-PAK

1.Gate 2. Drain 3. Source

FEATURES

- ❑ 100% EAS Test
- ❑ Super high density cell design
- ❑ Extremely Low Intrinsic Capacitances
- ❑ Remarkable Switching Characteristics
- ❑ Extended Safe Operating Area
- ❑ Lower $R_{DS(ON)}$: 5.8 mΩ (Typ.) @V_{GS}=10V

APPLICATION

- ❑ DC Motor control for E-bike & Power tools
- ❑ Amplifier and car booster
- ❑ Load Switch
- ❑ DC-DC converters

Absolute Maximum Ratings

T_j=25℃ unless otherwise specified

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	100	V
V_{GSS}	Gate-Source Voltage	±25	V
I_D	Continuous Drain Current (T_C = 25℃)	152	A
	Continuous Drain Current (T_C = 100℃)	107	A
I_{DM}	Pulsed Drain Current	608	A
E_{AS}	Single Pulsed Avalanche Energy	1400	mJ
P_D	Maximum Power Dissipation (T_C = 25℃)	300	W
	Maximum Power Dissipation (T_C = 70℃)	210	W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.5	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +175	℃
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	℃

Electrical Characteristics T_C=25 °C unless otherwise specified

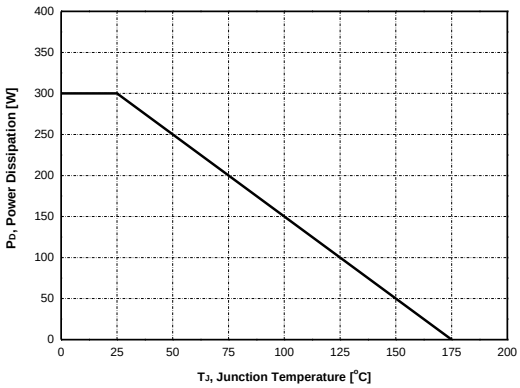
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 uA	2.0	--	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 90 A, T_C = 25℃	--	5.8	6.5	mΩ
		T_C =125℃		9.4	10.5	
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 uA	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 100 V, V_{GS} = 0 V	--	--	1	uA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 25 V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -25 V, V_{DS} = 0 V	--	--	-100	nA
V_{SD}	Diode Forward Voltage	I_S = 90 A, V_{GS} = 0 V	--	--	1.3	V
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=30 V, V_{GS}=0 V, f=1.0 MHz	--	7900	--	pF
C_{oss}	Output Capacitance		--	780	--	pF
C_{rss}	Reverse Transfer Capacitance		--	690	--	pF
R_g	Gate Resistance	V_{DS}=30 V, V_{GS}=0 V, f=1.0 MHz	--	1.3	--	Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Time	V_{DS} = 50V, R_L = 3Ω I_D = 90A, V_{GS} = 10V, R_G = 3.3Ω	--	25	--	ns
t_r	Turn-On Rise Time		--	40	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	85	--	ns
t_f	Turn-Off Fall Time		--	45	--	ns
Q_g	Total Gate Charge	V_{DS}=80V, I_D=90 A, V_{GS}=10V	--	154	--	nC
Q_{gs}	Gate-Source Charge		--	35	--	nC
Q_{gd}	Gate-Drain Charge		--	40	--	nC

Notes ;

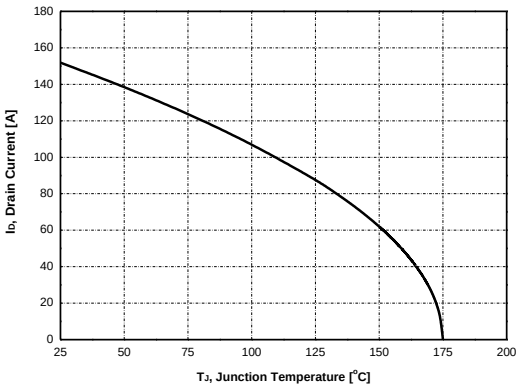
1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L=0.12mH, I_{AS}=152, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
4. Essentially Independent of Operating Temperature

Typical Characteristics

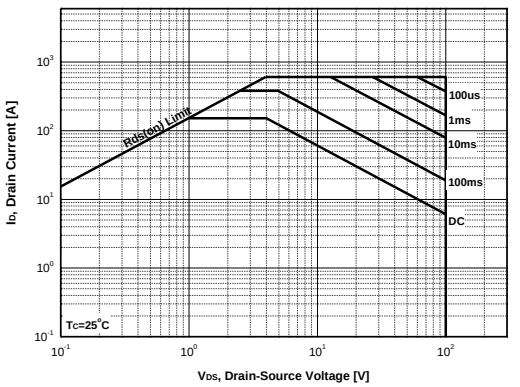
Power Dissipation



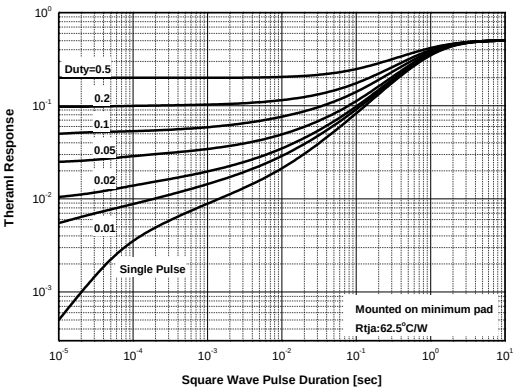
Drain Current



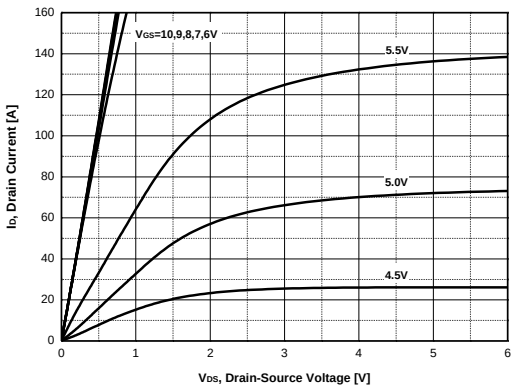
Safe Operation Area



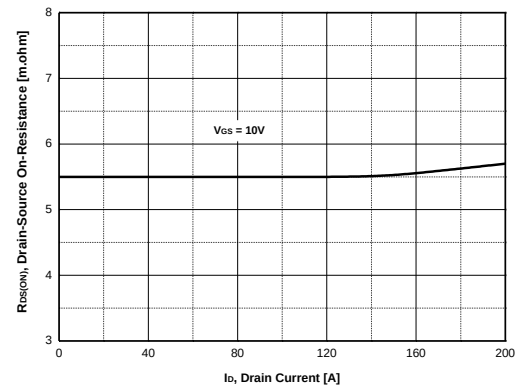
Thermal Transient Impedance



Output Characteristics

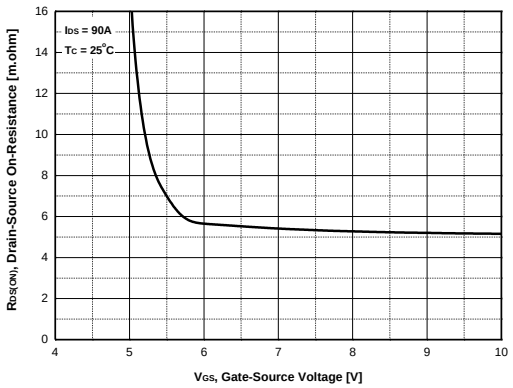


Drain-Source On Resistance

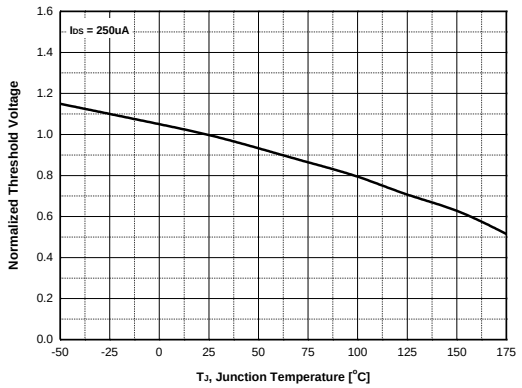


Typical Characteristics (continued)

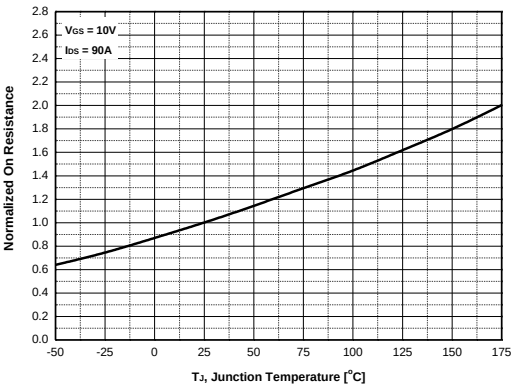
Drain-Source On Resistance



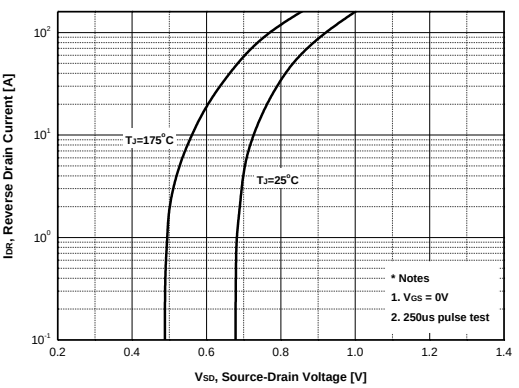
Gate Threshold Voltage



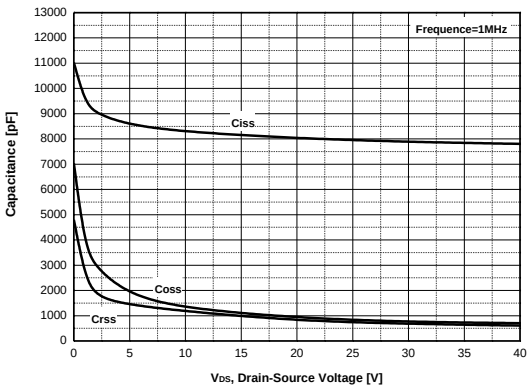
Drain-Source On Resistance



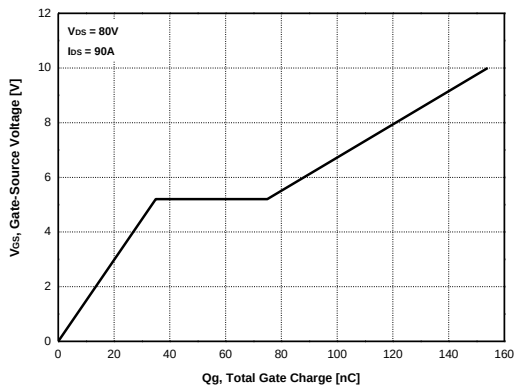
Source-Drain Diode Forward



Capacitance



Gate Charge



Characteristics Test Circuit & Waveform

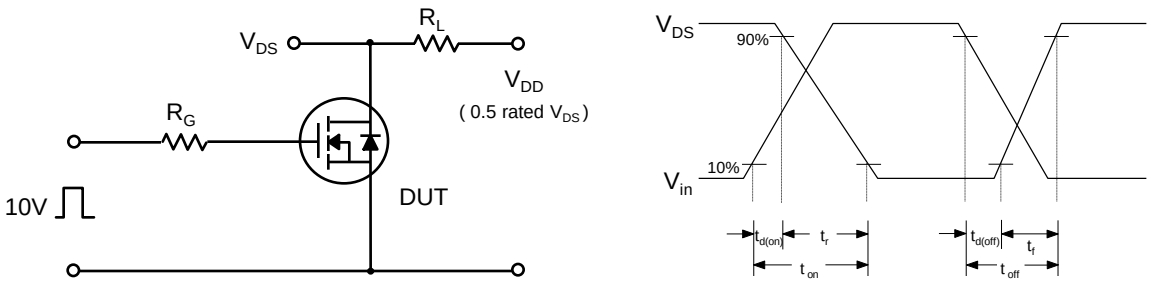


Fig 14. Resistive Switching Test Circuit & Waveforms

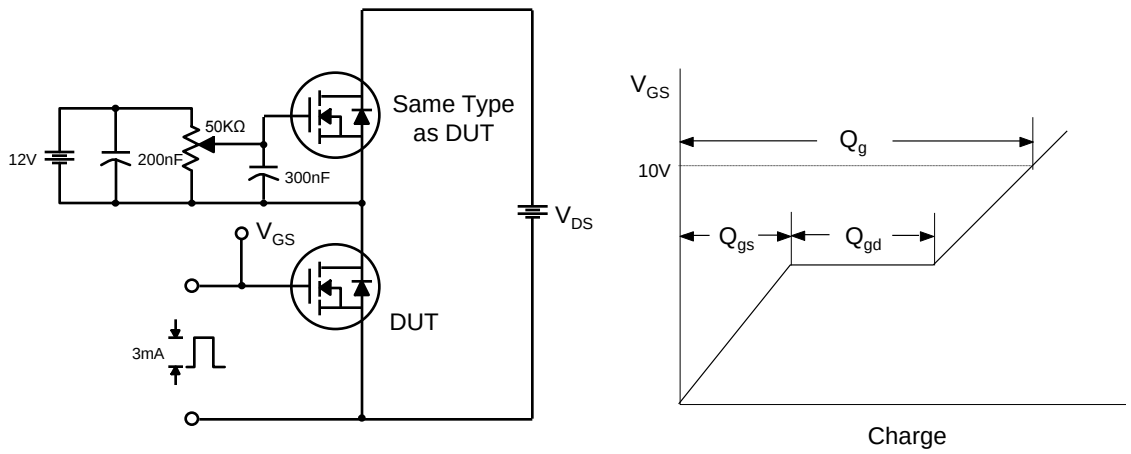


Fig 15. Gate Charge Test Circuit & Waveform

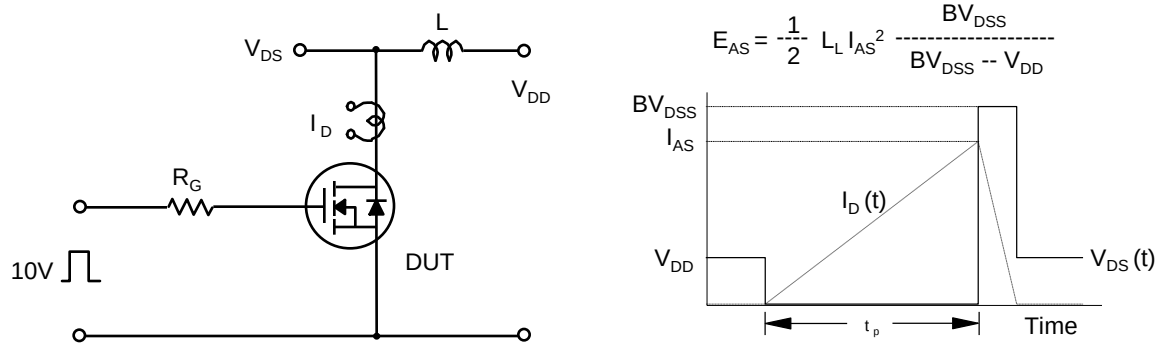
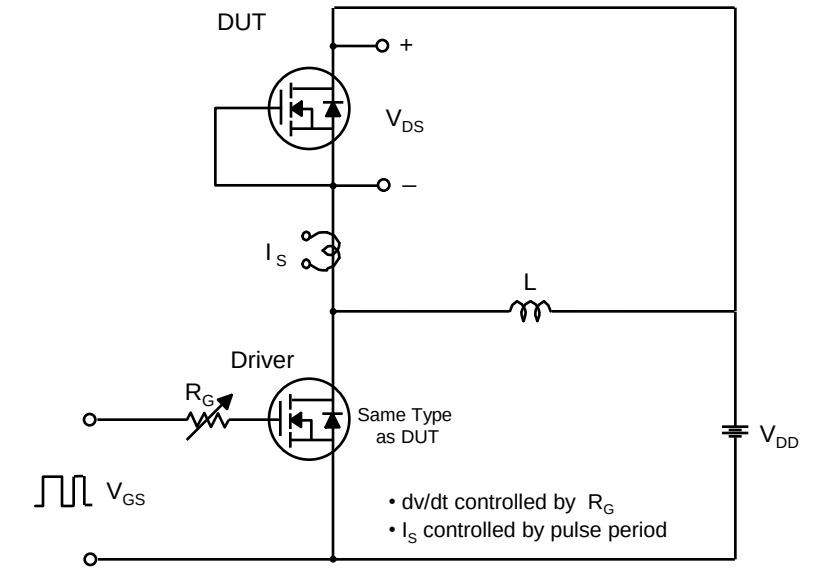


Fig 16. Unclamped Inductive Switching Test Circuit & Waveforms

Characteristics Test Circuit & Waveform (continued)



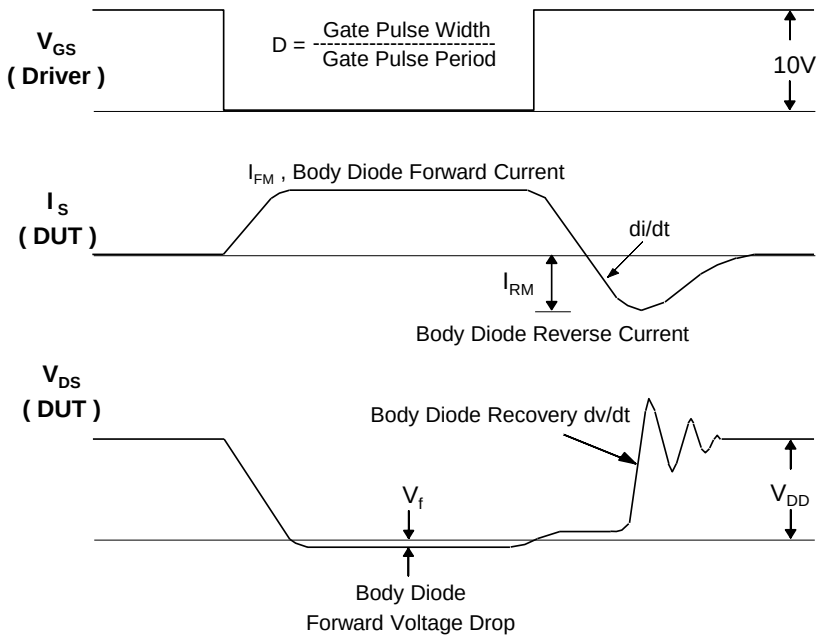
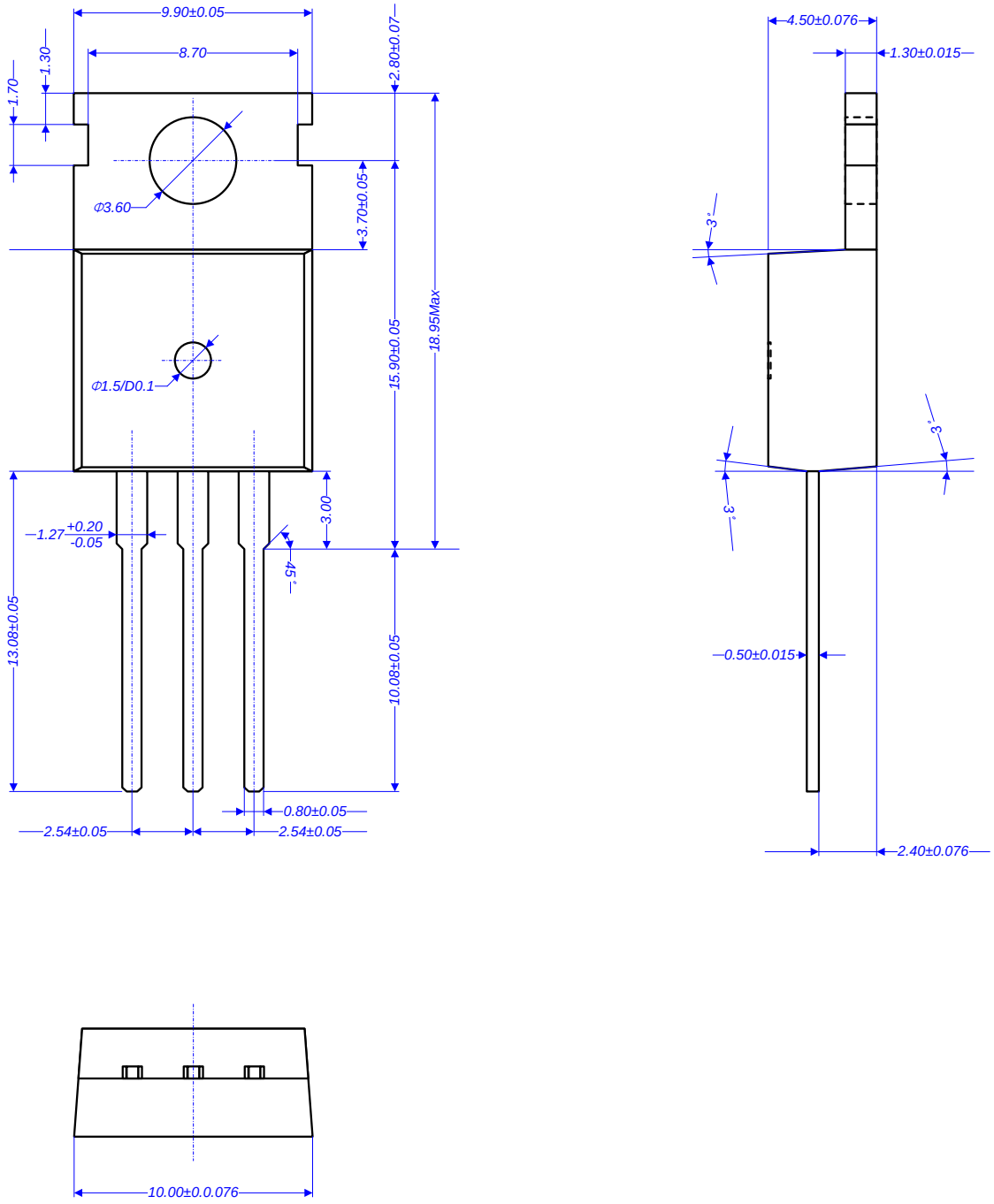


Fig 17. Peak Diode Recovery dv/dt Test Circuit & Waveforms

Z/H

Package Dimension

TO-220



Package Dimension

TO-263 (D2-PAK)