

TO-252

V_{DS}	100V
I_D	45A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	17m
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	21.5m
100% UIS Tested	
100% V_{DS} Tested	

Low $R_{DS(on)}$ & FOM
Extremely low switching loss
Excellent stability and uniformity
Fast switching and soft recovery
Part no. with suffix "Q" means AEC-Q101 qualified

Power switching application
Hard switched and high frequency circuits
Uninterruptible power supply
DC-DC convertor

($T_A=25$ unless otherwise noted)

Drain-source Voltage		V_{DS}	100	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_A=25^\circ C$	I_D	7	A
	$T_A=100^\circ C$		4.5	
	$T_C=25^\circ C$		45	
	$T_C=100^\circ C$		28	
Pulsed Drain Current ^A		I_{DM}	180	A
Avalanche energy ^B		EAS	90	mJ
Total Power Dissipation ^C	$T_A=25^\circ C$	P_D	2.5	W
	$T_A=100^\circ C$		1	
	$T_C=25^\circ C$		73	
	$T_C=100^\circ C$		29	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 +150	$^\circ C$



Thermal Resistance Junction-to-Ambient ^D	Steady-State	R _{JA}	40	50	°C/W
Thermal Resistance Junction-to-Case	Steady-State	R _{JC}	1.4	1.7	

(Example)

YJD45G10AQ	F1	YJD45G10A	2500	/	25000	13"Reel



($T_J=25$ unless otherwise noted)

Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=100V, V_{GS}=0V, T_J=150^\circ C$	-	-	100	
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.8	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=22.5A$	-	14	17	m
		$V_{GS}=4.5V, I_D=20A$	-	17	21.5	
Diode Forward Voltage	V_{SD}	$I_S=22.5A, V_{GS}=0V$	-	0.9	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	45	A
Gate resistance	R_G	$f=1MHz, \text{Open drain}$	-	1.4	-	
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	-	1165	-	μF
Output Capacitance	C_{oss}		-	265	-	
Reverse Transfer Capacitance	C_{rss}		-	8	-	
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=50V, I_D=22.5A$	-	19	-	nC
Gate-Source Charge	Q_{gs}		-	6	-	
Gate-Drain Charge	Q_{gd}		-	3	-	
Reverse Recovery Charge	Q_{rr}	$I_F=22.5A, di/dt=100A/\mu s$	-	45	-	nC
Reverse Recovery Time	t_{rr}		-	40	-	ns
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=50V, I_D=22.5A$ $R_{GEN}=2.2$	-	40	-	ns
Turn-on Rise Time	t_r		-	12	-	
Turn-off Delay Time	$t_{D(off)}$		-	55	-	
Turn-off fall Time	t_f		-	16	-	

A. Repetitive rating; pulse width limited by max. junction temperature.

B. $T_J=25^\circ C, V_{DD}=50V, V_G=10V, R_G=25\ \Omega, L=0.5mH, I_{AS}=19A$.

C. P_d is based on max. junction temperature, using junction-case thermal resistance.

D. The value of R_{JA} is measured with the device mounted on the minimum recommend pad size, in the still air environment with $T_A=25^\circ C$.
The maximum allowed junction temperature of $150^\circ C$. The value in any given application depends on the user's specific board design.

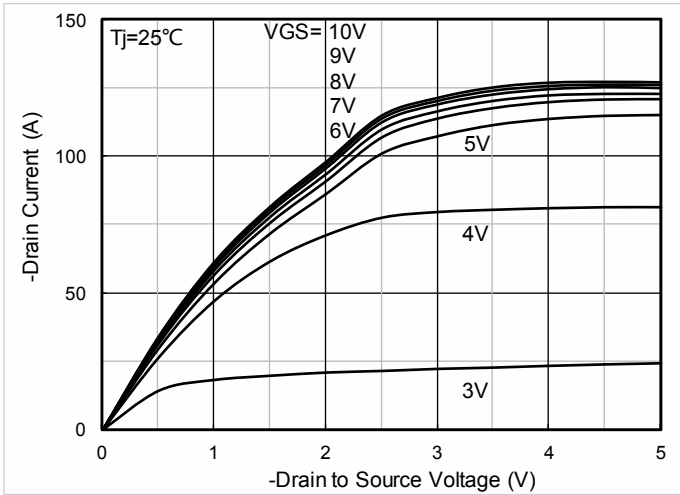


Figure 1. Output Characteristics

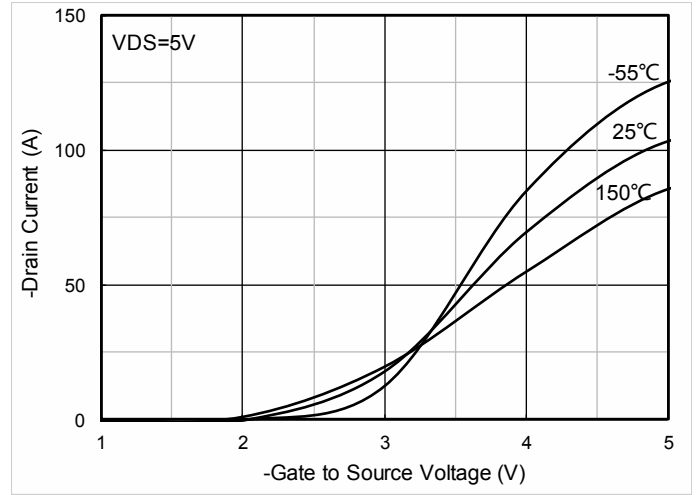


Figure 2. Transfer Characteristics

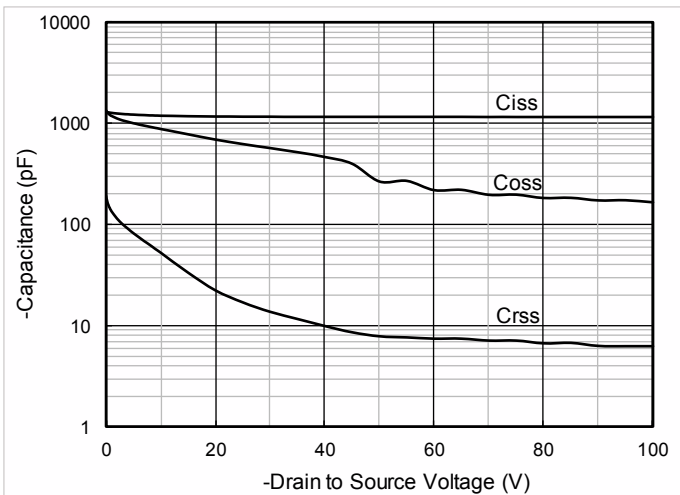


Figure 3. Capacitance Characteristics

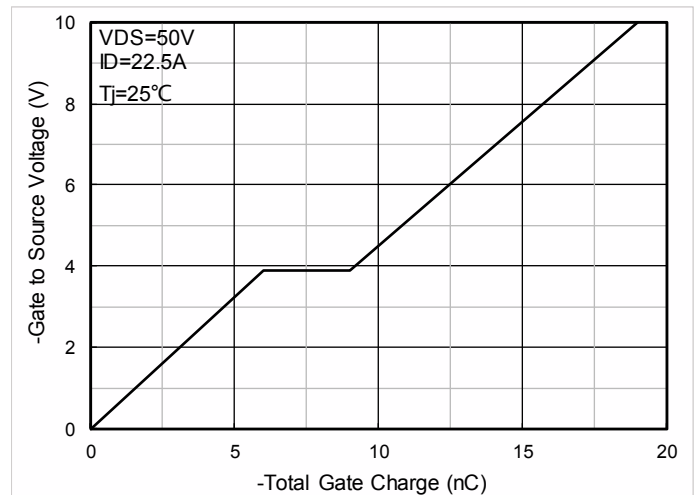


Figure 4. Gate Charge

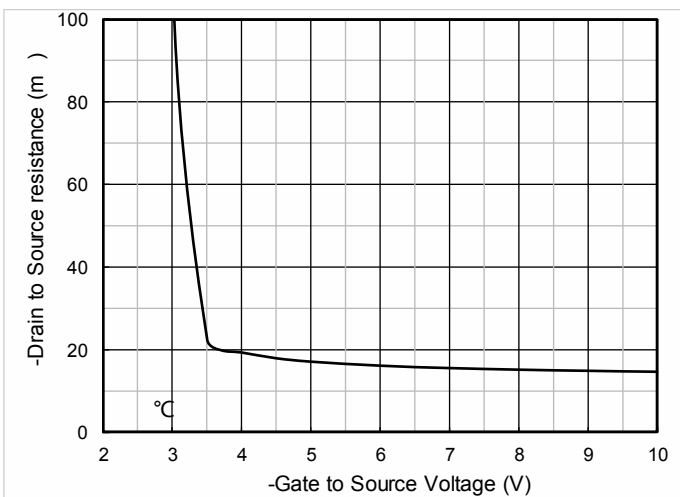


Figure 5. On-Resistance vs Gate to Source Voltage

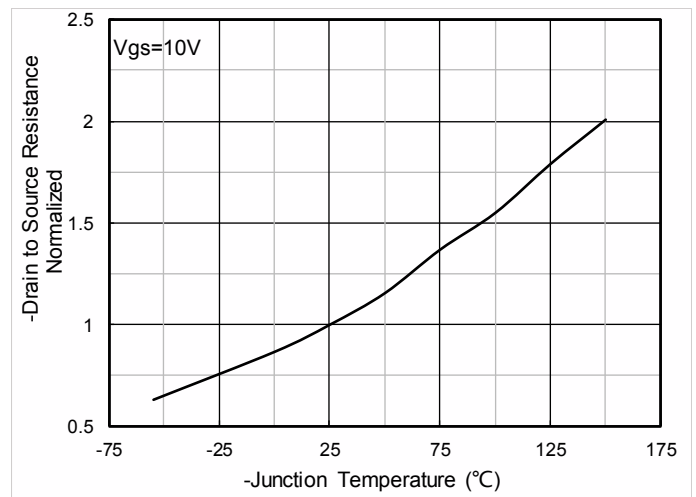


Figure 6. Normalized On-Resistance

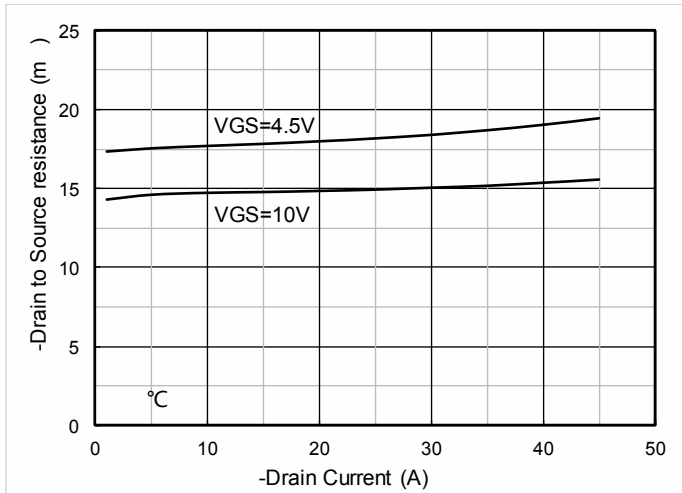


Figure 7. $R_{DS(on)}$ VS Drain Current

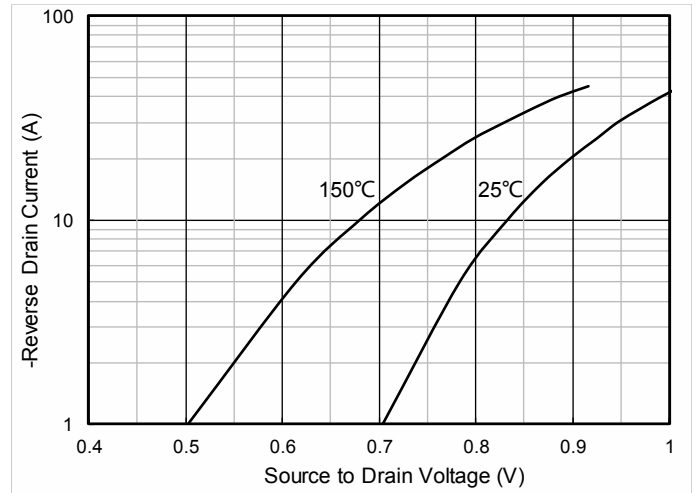


Figure 8.

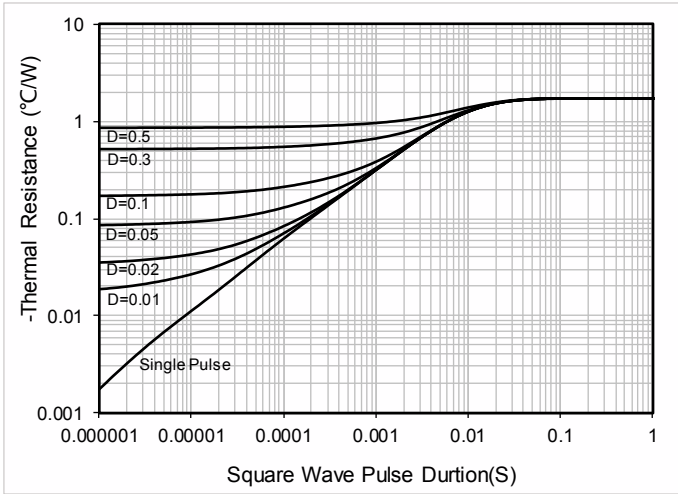


Figure 13. Maximum Transient Thermal Impedance

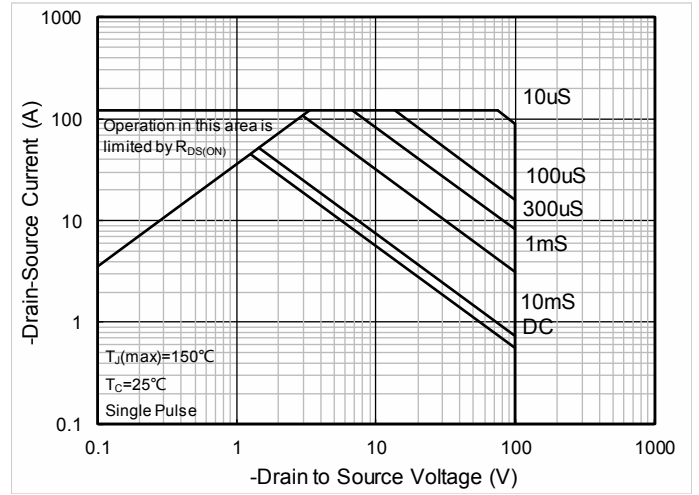


Figure 14. Safe Operation Area

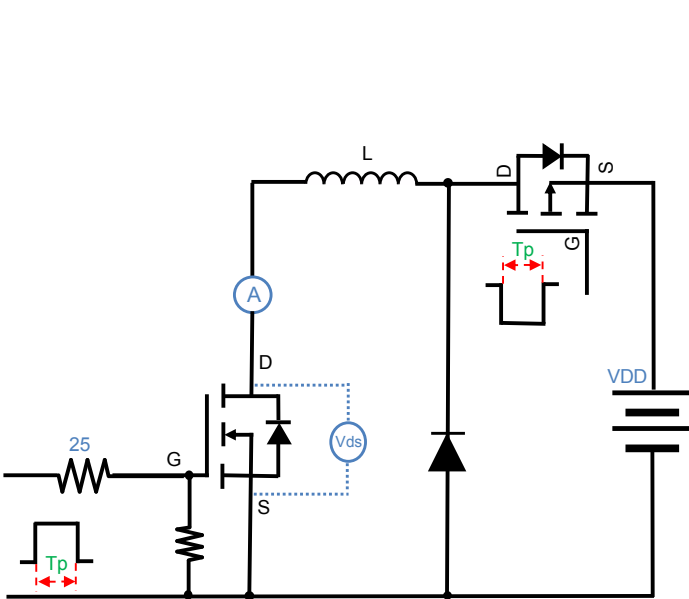
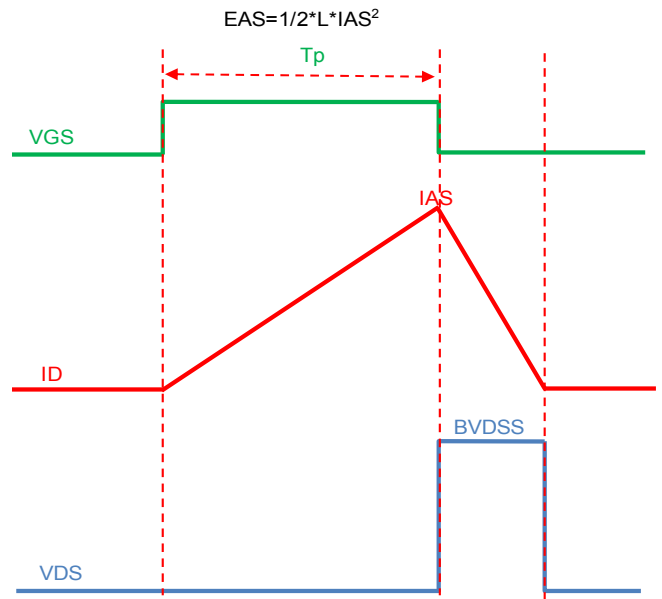


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform



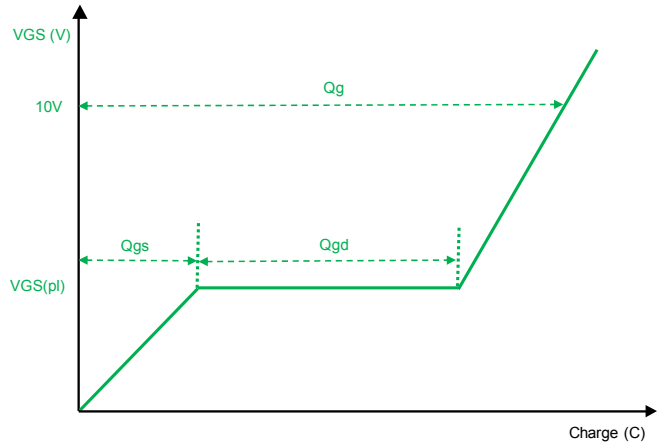
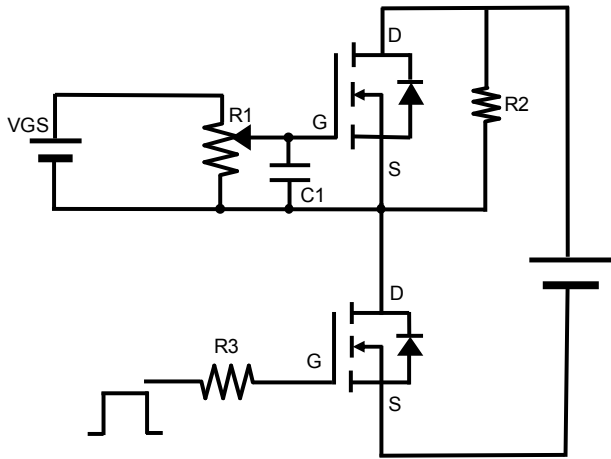


Figure B. Gate Charge Test Circuit & Waveform

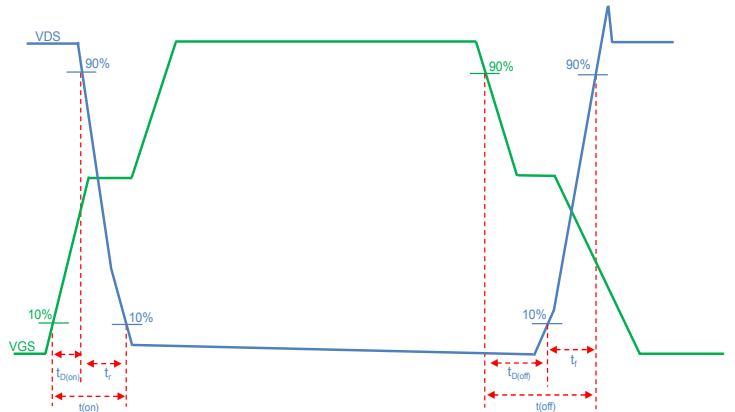
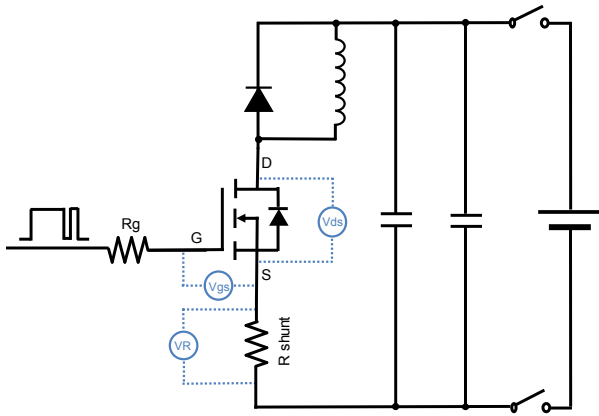


Figure C. Resistive Switching Test Circuit & Waveform

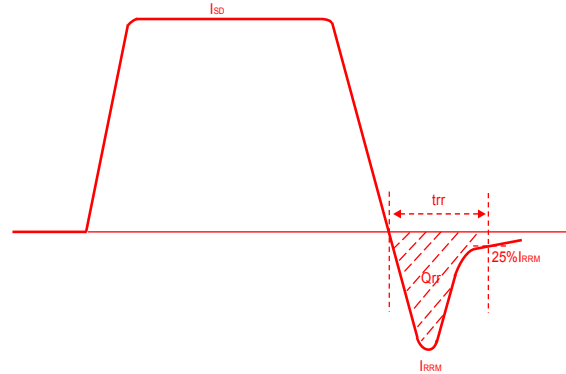
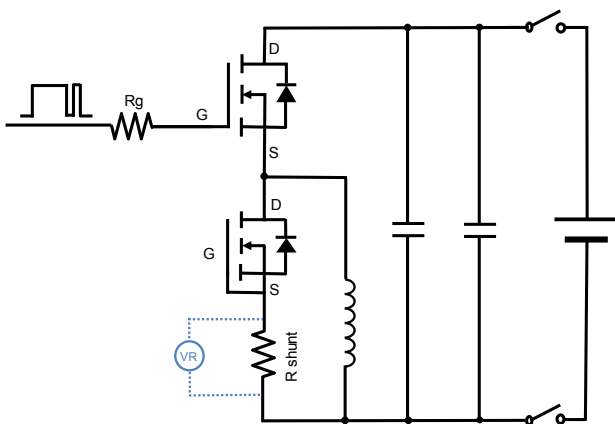
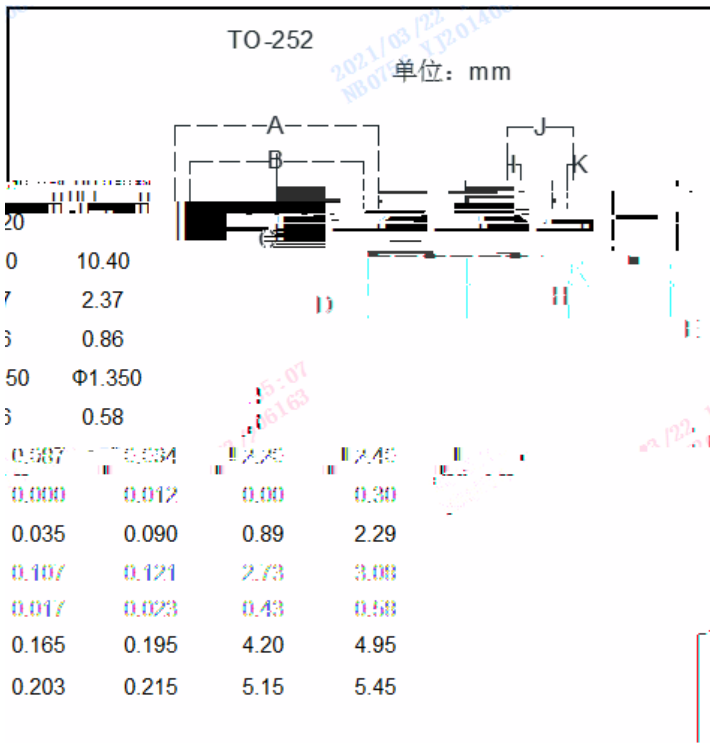
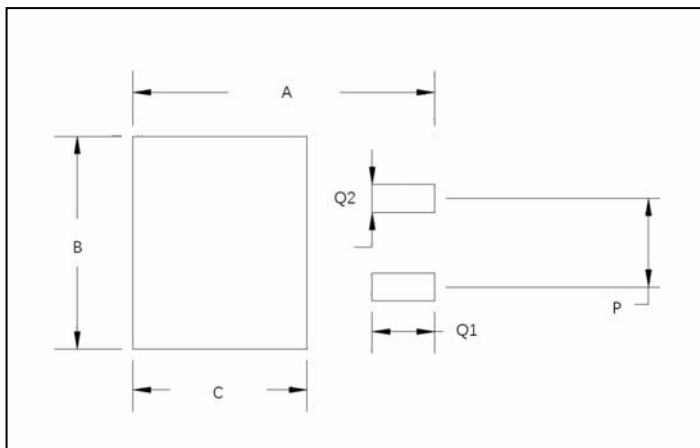


Figure D. Diode Recovery Test Circuit & Waveform



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.256	0.264	6.50	6.70	
B	0.201	0.215	5.10	5.46	
C	0.236	0.244	6.00	6.20	
D	0.236	0.244	6.00	6.20	
E	0.394	0.409	10.0		
F	0.085	0.093	2.17		
G	0.026	0.034	0.66		
H	Φ0.041	Φ0.531	Φ1.0		
I	0.018	0.023	0.46		
J					
K					
L					
M					
N					
O					
P					



A	11.4
B	6.74
C	6.23
P	4.56
Q1	2.28
Q2	1.52