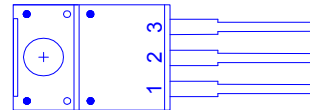
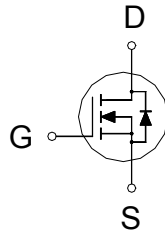


NIKO-SEM**N-Channel Enhancement Mode
Field Effect Transistor****P1065ATF:TO-220F
P1065ATFS:TO-220FS
Halogen-Free & Lead-Free****PRODUCT SUMMARY**

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
650V	0.75Ω	10A



1. GATE
2. DRAIN
3. SOURCE

ABSOLUTE MAXIMUM RATINGS ($T_C = 25\text{ °C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS	
Drain-Source Voltage		V_{DS}	650	V	
Gate-Source Voltage		V_{GS}	±30	V	
Continuous Drain Current ²	$T_C = 25\text{ °C}$	I_D	10	A	
	$T_C = 100\text{ °C}$		6		
Pulsed Drain Current ^{1, 2}		I_{DM}	35		
Avalanche Current ³		I_{AS}	5.1	A	
Avalanche Energy ³		$L = 10\text{mH}$	E_{AS}	132	mJ
Power Dissipation	$T_C = 25\text{ °C}$	P_D	33	W	
	$T_C = 100\text{ °C}$		13		
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C	

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		3.8	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

¹Pulse width limited by maximum junction temperature.²Limited only by maximum temperature allowed³ $V_{DD} = 60\text{V}$, starting $T_J = 25\text{ °C}$ **ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ °C}$, Unless Otherwise Noted)**

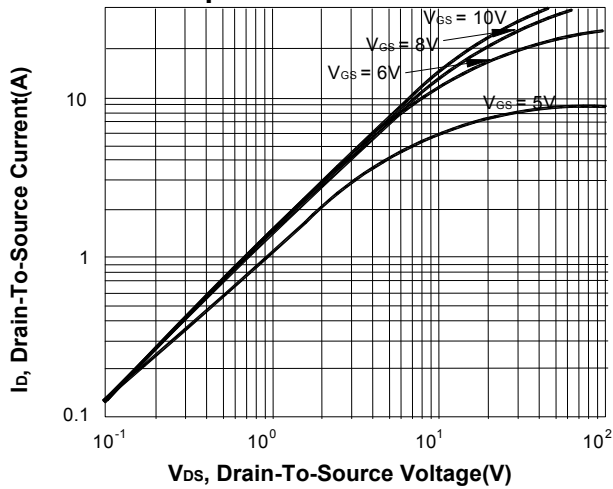
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	650			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.5		4.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 30\text{V}$			±100	nA
Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 650\text{V}, V_{GS} = 0\text{V}, T_C = 25\text{ °C}$			25	μA
		$V_{DS} = 650\text{V}, V_{GS} = 0\text{V}, T_C = 100\text{ °C}$			250	

NIKO-SEM**N-Channel Enhancement Mode
Field Effect Transistor****P1065ATF:TO-220F
P1065ATFS:TO-220FS
Halogen-Free & Lead-Free**

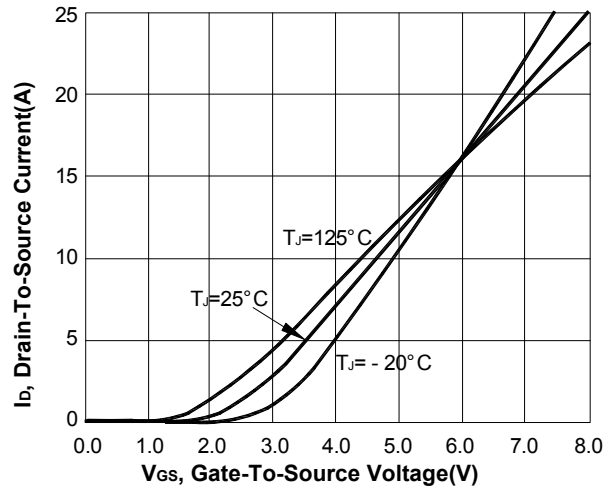
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 5A$	0.6	0.75	Ω
Forward Transconductance ¹	g_{fs}	$V_{DS} = 40V, I_D = 5A$	4.5		S
DYNAMIC					
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$	2440		pF
Output Capacitance	C_{oss}		221		
Reverse Transfer Capacitance	C_{rss}		26		
Total Gate Charge ²	Q_g	$V_{DD} = 325V, I_D = 5A, V_{GS} = 10V$	42		nC
Gate-Source Charge ²	Q_{gs}		12.9		
Gate-Drain Charge ²	Q_{gd}		11.5		
Turn-On Delay Time ²	$t_{d(on)}$	$V_{DD} = 325V, I_D = 10A, R_G = 32.5\Omega$	20		nS
Rise Time ²	t_r		50		
Turn-Off Delay Time ²	$t_{d(off)}$		100		
Fall Time ²	t_f		55		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_c = 25^\circ C$)					
Continuous Current ³	I_S			10	A
Forward Voltage ¹	V_{SD}	$I_F = 10A, V_{GS} = 0V$		1.4	V
Reverse Recovery Time	t_{rr}	$I_F = 10 A, dI_F/dt = 100A / \mu S$	620		nS
Reverse Recovery Charge	Q_{rr}	$V_{GS} = 0V$	10		uC

¹Pulse test : Pulse Width $\leq 300 \mu sec$, Duty Cycle $\leq 2\%$.²Independent of operating temperature.³Pulse width limited by maximum junction temperature.**REMARK: THE PRODUCT MARKED WITH "P1065ATF(S)", DATE CODE or LOT #**

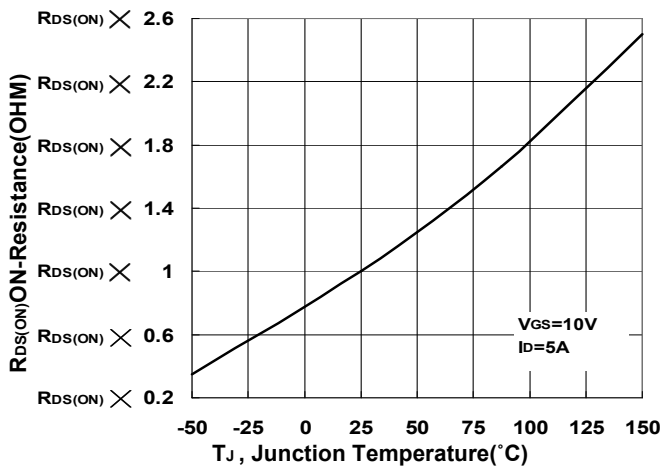
Output Characteristics



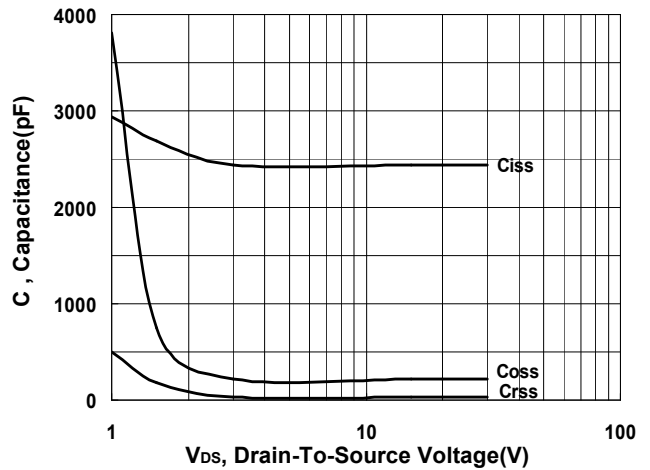
Transfer Characteristics



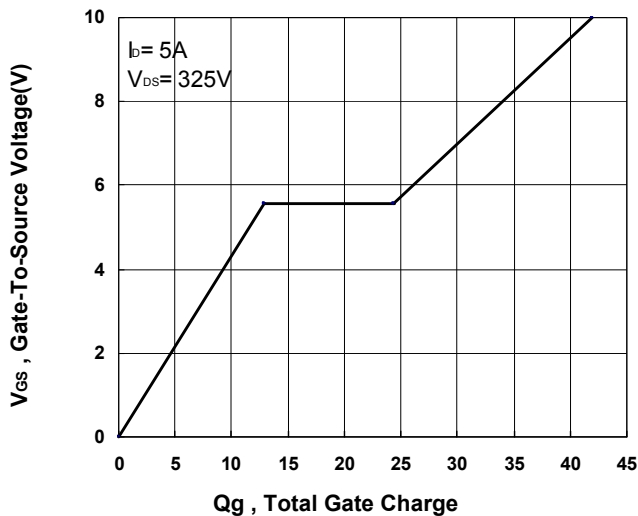
On-Resistance VS Temperature



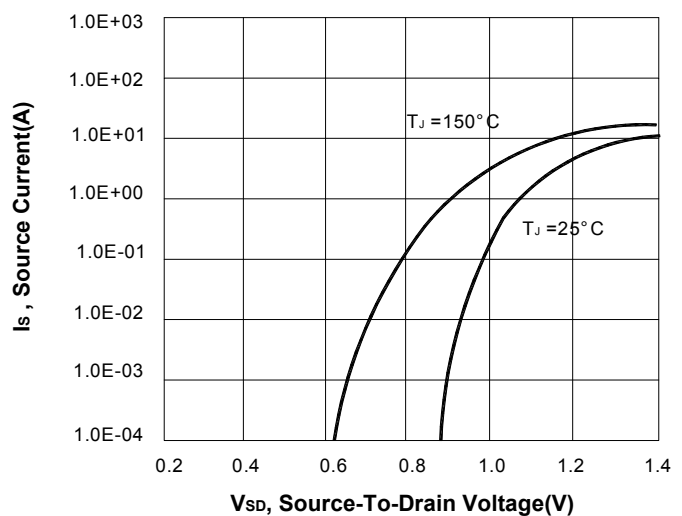
Capacitance Characteristic



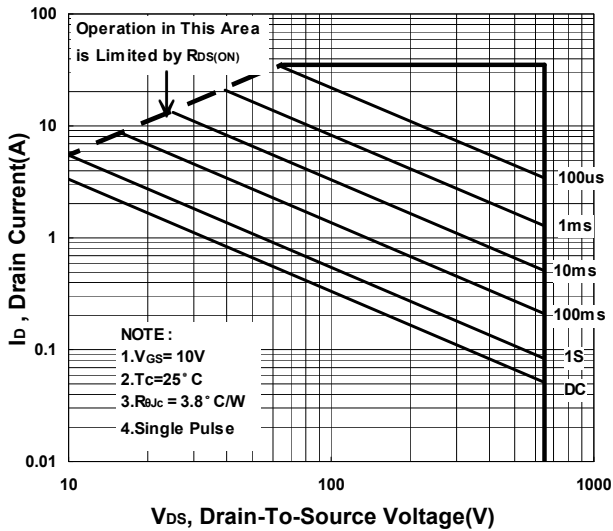
Gate charge Characteristics



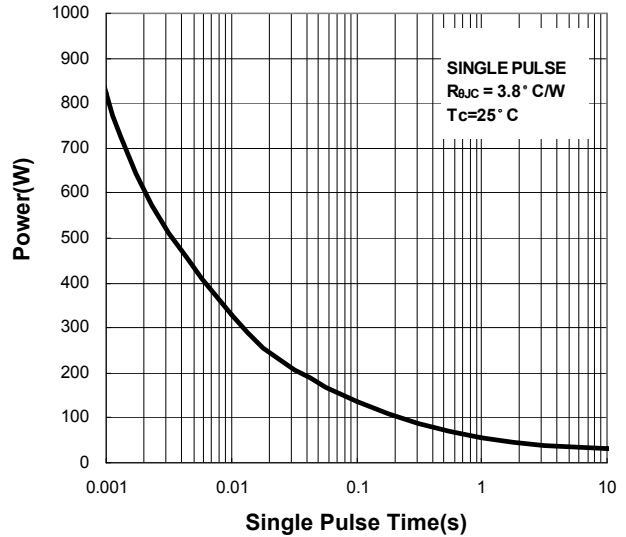
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

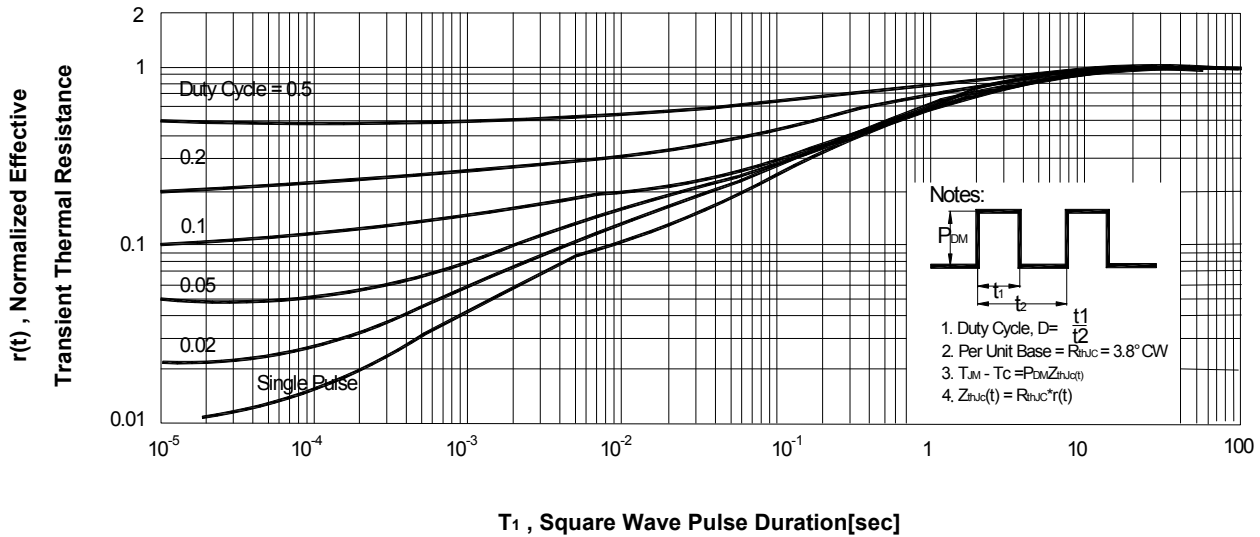


Figure 1
Gate Charge Test Circuit

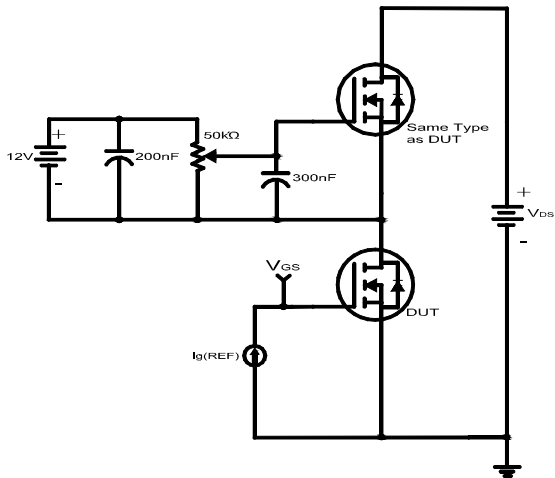


Figure 2
Gate Charge Waveforms

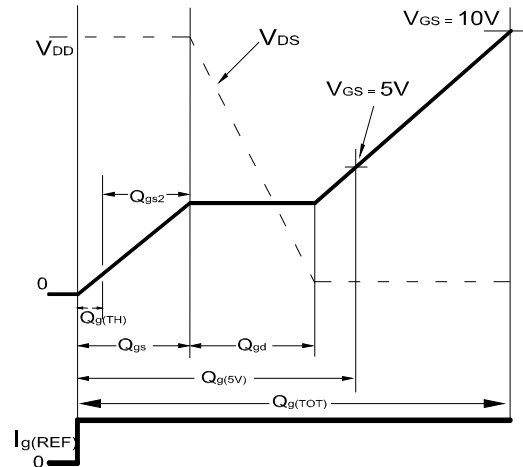


Figure 3
Switching Time Test Circuit

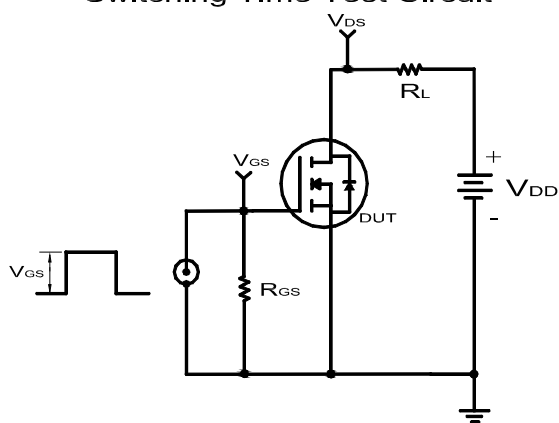


Figure 4
Switching Time Waveforms

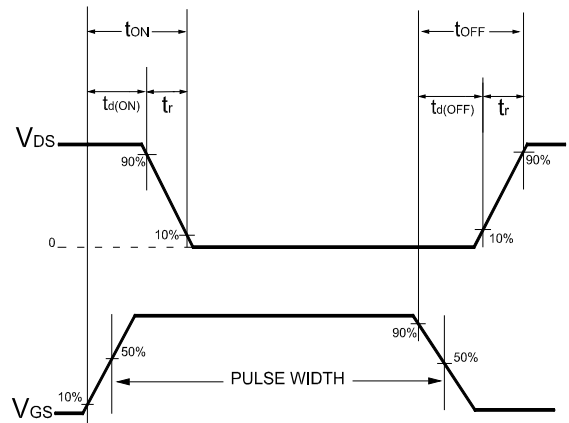


Figure 5
Unclamped Energy Test Circuit

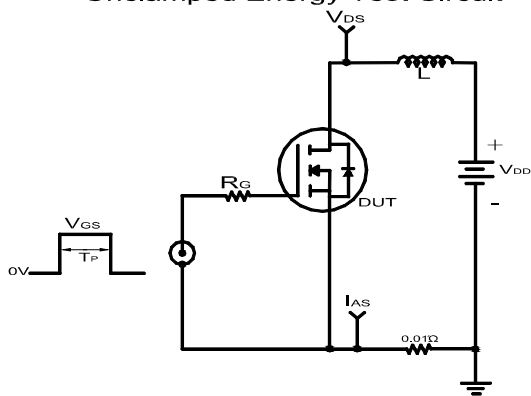


Figure 6
Unclamped Energy Waveforms

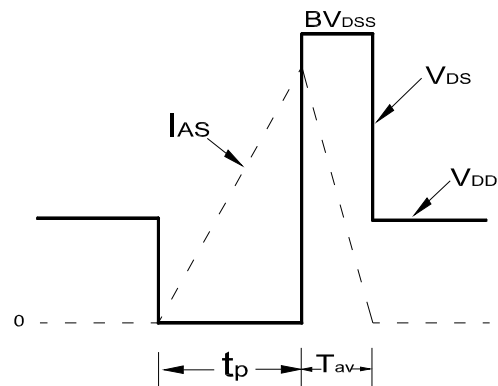


Figure 7
Diode Recovery Test Circuit

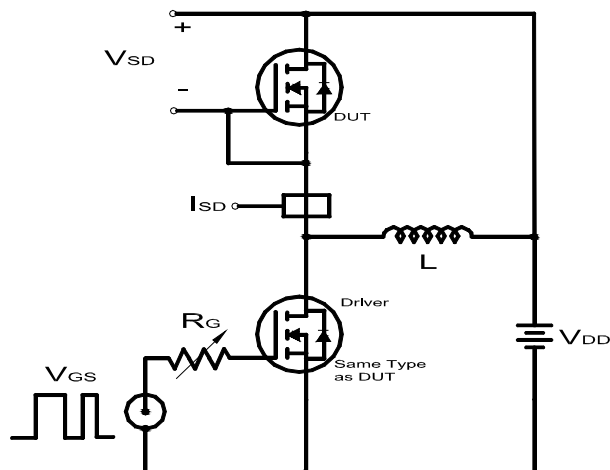
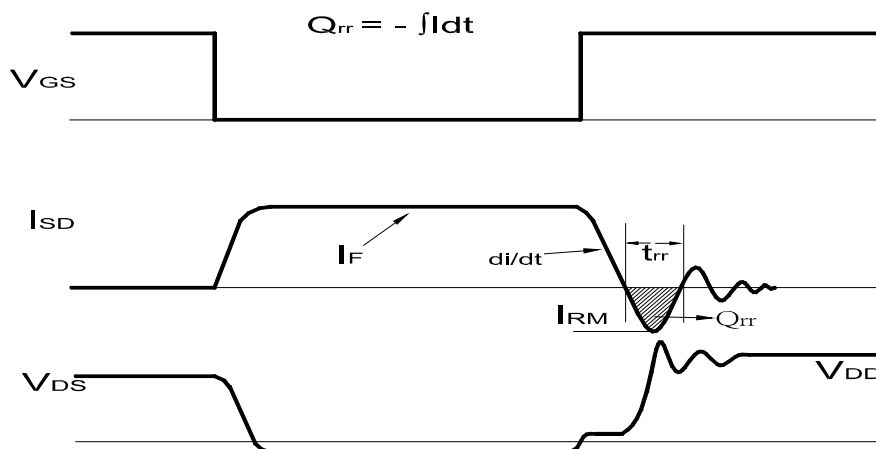
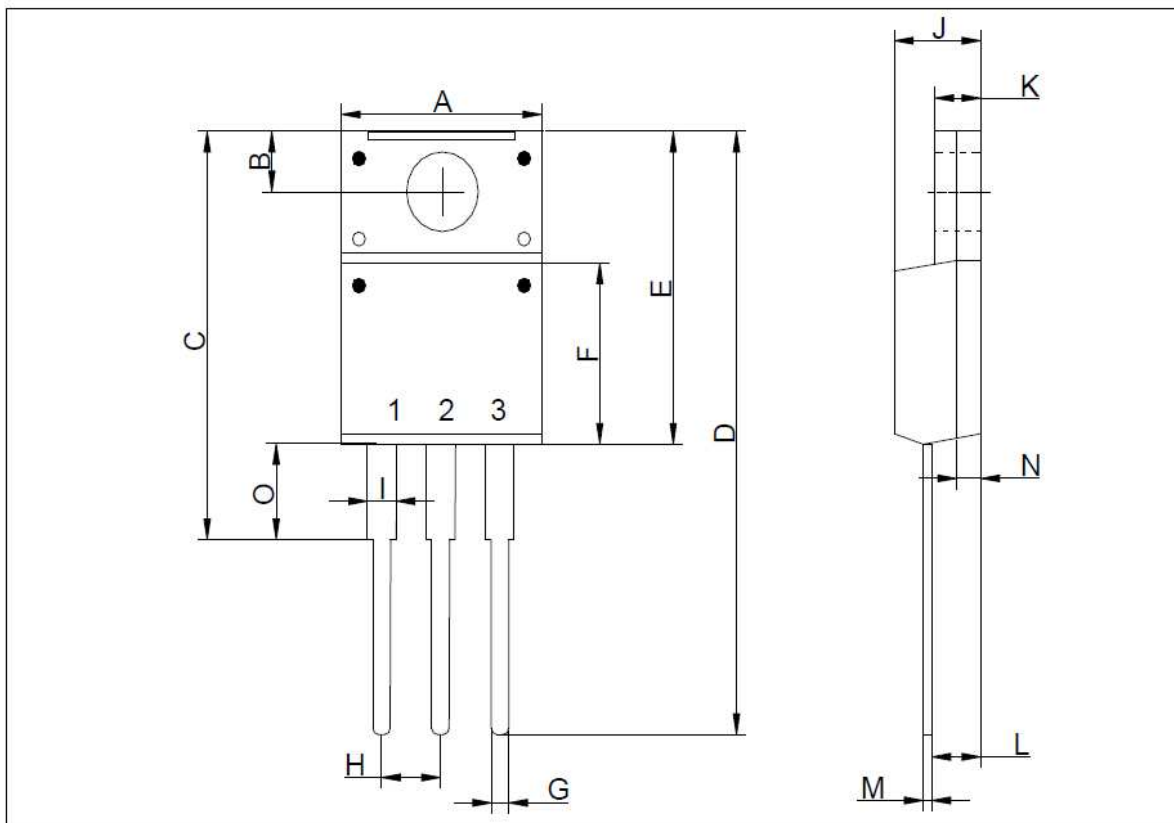


Figure 8
Diode Recovery Test Waveforms



TO-220F (3-Lead) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.96	10.0	10.6	I	0.95	1.2	1.39
B	2.4	3.0	3.38	J	4.3	4.5	4.93
C	18.1	19.1	19.7	K	2.34		2.74
D	27.3	28.4	30	L	2.56		2.96
E	15.67		16.1	M	0.45		0.6
F	8.8	9.17	9.8	N		0.7	
G	0.5	0.75	0.91	O	2.8		3.4
H	2.3		2.74				



TO-220FS (3-Lead) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.96		10.36	I	1.15		1.39
B	3.1		3.5	J	4.53		4.93
C	17.55		18.95	K	2.34		2.74
D	28.04		28.84	L	2.56		2.96
E	15.67		16.07	M	0.45		0.60
F		9.17		N		0.7	
G	0.71		0.91	O	2.23		2.63
H		2.54					

