

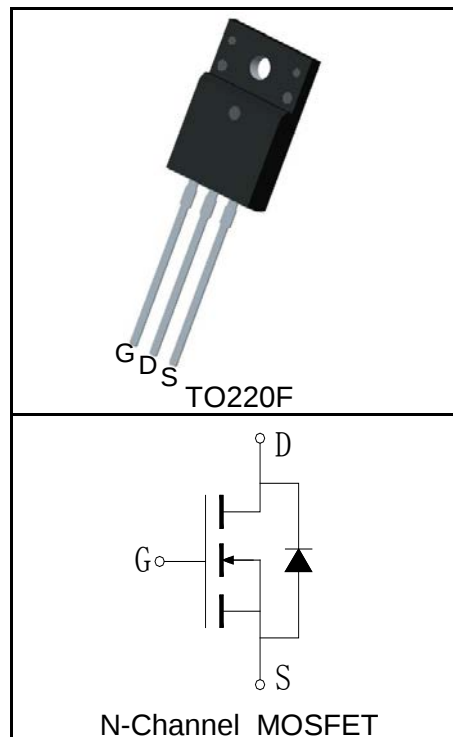
Features

- 500V/5A,
 $R_{DS(ON)} = 1200m\Omega(Typ.)@V_{GS}=10V$
- Super High Dense Cell Design
- Fast Switching
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- High efficiency switch mode power supplies
- Lighting

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		500	V
V _{GSS}	Gate-Source Voltage		±30	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	5	A
Mounted on Large Heat Sink				
I _{DP} ^①	300μs Pulse Drain Current Tested	T _C =25°C	20	A
I _D ^②	Continuous Drain Current(V _{GS} =10V)	T _C =25°C	5	A
		T _C =100°C	3.5	
P _D	Maximum Power Dissipation	T _C =25°C	25	W
		T _C =100°C	10	
R _{θJC}	Thermal Resistance-Junction to Case		5	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^③	Avalanche Energy, Single Pulsed		180	mJ

Electrical Characteristics ($T_C=25^{\circ}\text{C}$ Unless Otherwise Noted)

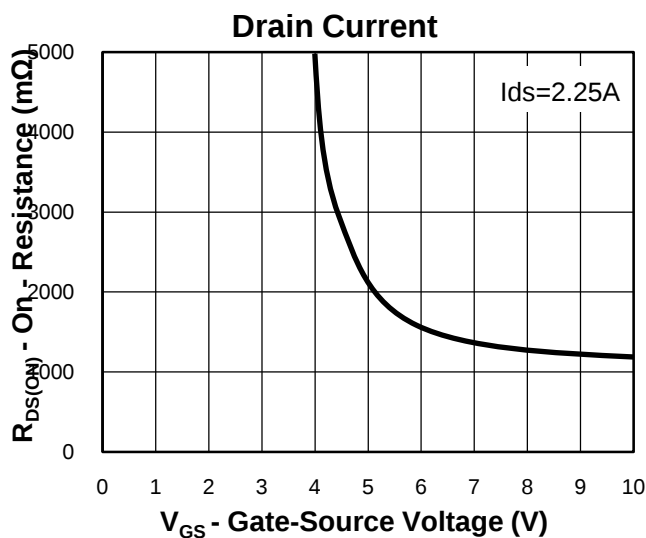
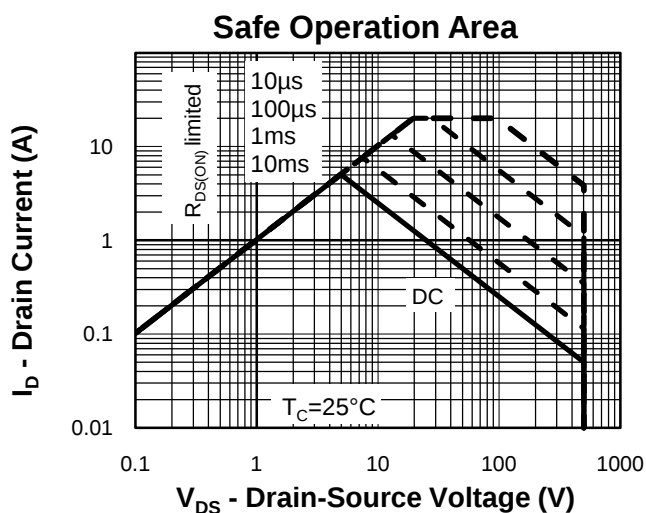
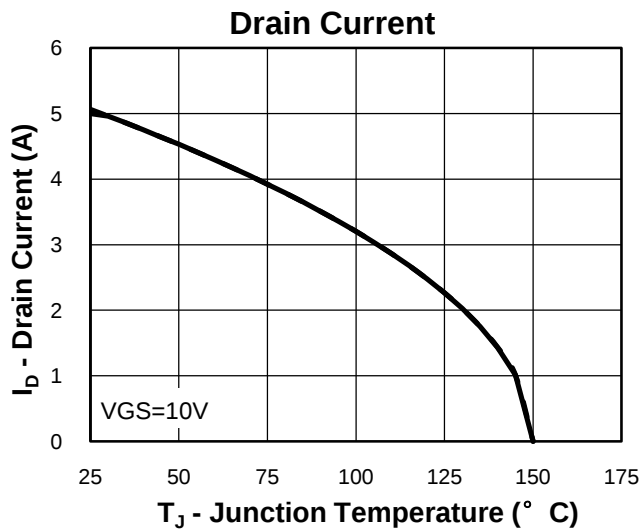
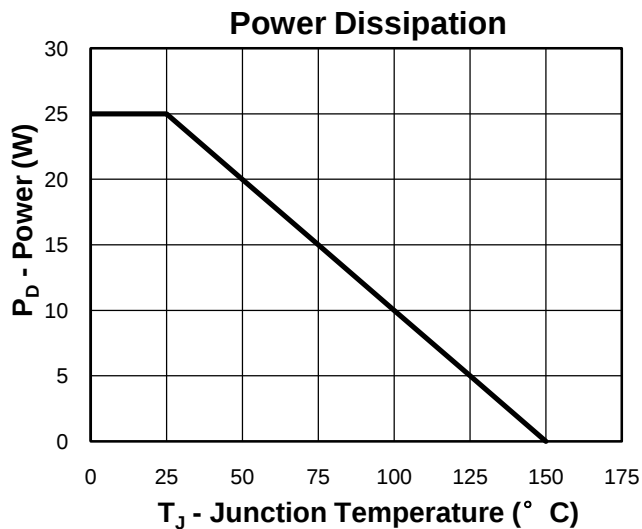
Symbol	Parameter	Test Condition	RU5H5P			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	500			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =500V, V _{GS} =0V			1	μA
			T _J =125°C		30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2	3	4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±30V, V _{DS} =0V			±100	nA
R _{DS(ON)} ^④	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =2.25A		1200	1500	mΩ
Diode Characteristics						
V _{SD} ^④	Diode Forward Voltage	I _{SD} =4.5A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =4.5A, dI _{SD} /dt=100A/μs		250		ns
Q _{rr}	Reverse Recovery Charge			2.4		μC
Dynamic Characteristics ^⑤						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz		4.7		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =250V, Frequency=1.0MHz		560		pF
C _{oss}	Output Capacitance			95		
C _{rss}	Reverse Transfer Capacitance			18		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =250V, R _L =55Ω, I _{DS} =4.5A, V _{GEN} =10V, R _G =25Ω		20		ns
t _r	Turn-on Rise Time			35		
t _{d(OFF)}	Turn-off Delay Time			45		
t _f	Turn-off Fall Time			25		
Gate Charge Characteristics ^⑤						
Q _g	Total Gate Charge	V _{DS} =400V, V _{GS} =10V, I _{DS} =4.5A		15		nC
Q _{gs}	Gate-Source Charge			3		
Q _{gd}	Gate-Drain Charge			6		

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature.
 - ③ Limited by T_{Jmax} , $I_{AS}=6A$, $V_{DD}=100V$, $R_G=50\Omega$, Starting $T_J=25^{\circ}\text{C}$.
 - ④ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑤ Guaranteed by design, not subject to production testing.

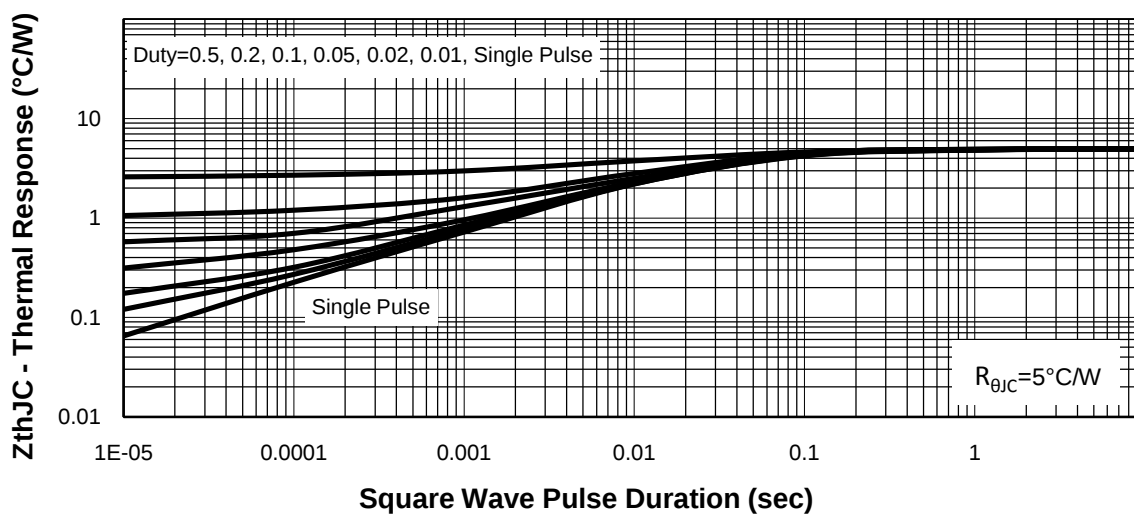
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU5H5P	RU5H5P	TO220F	Tube	50	-	-

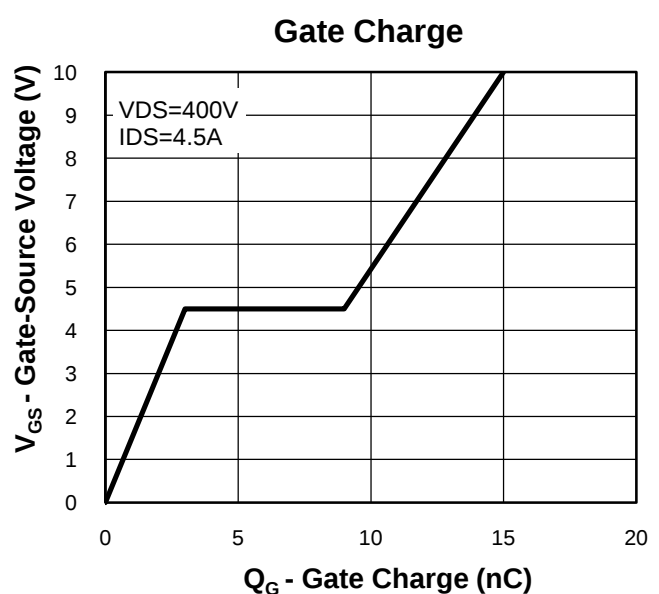
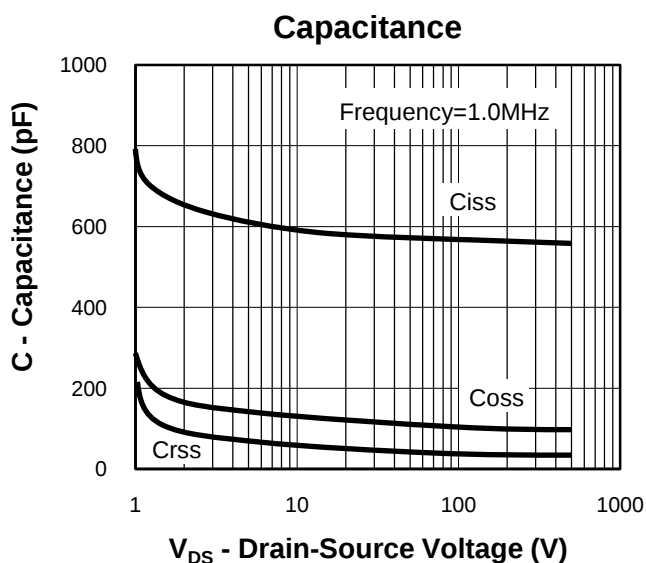
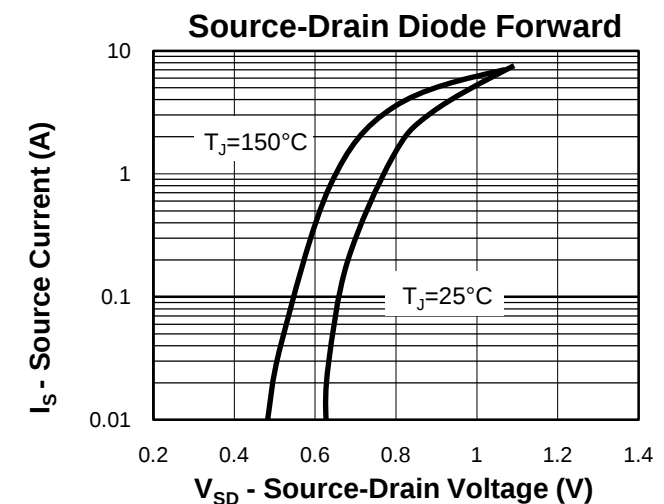
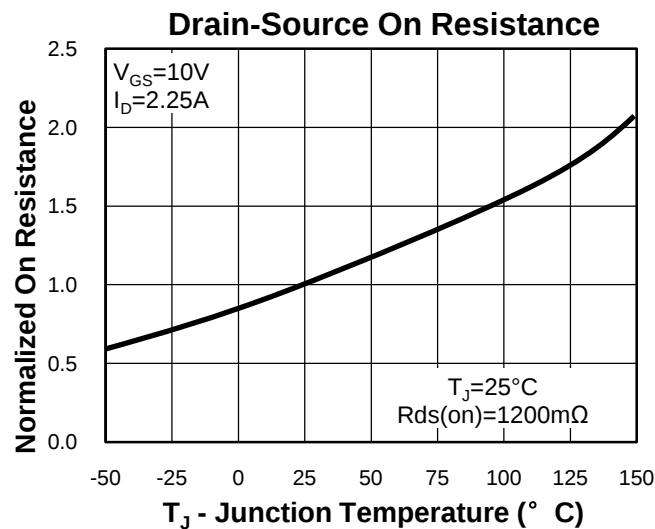
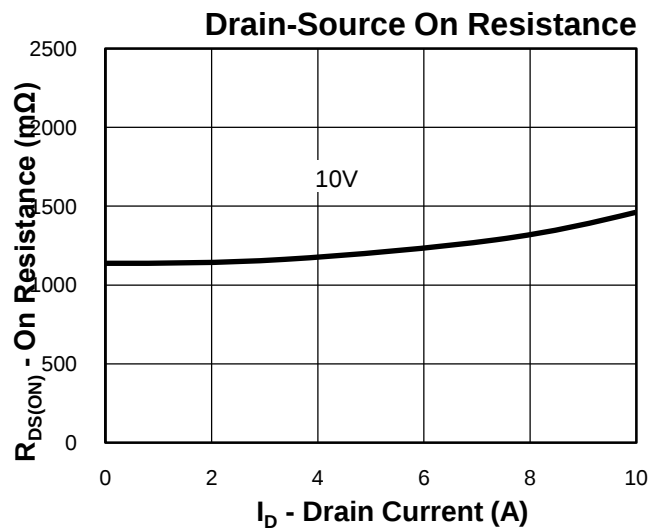
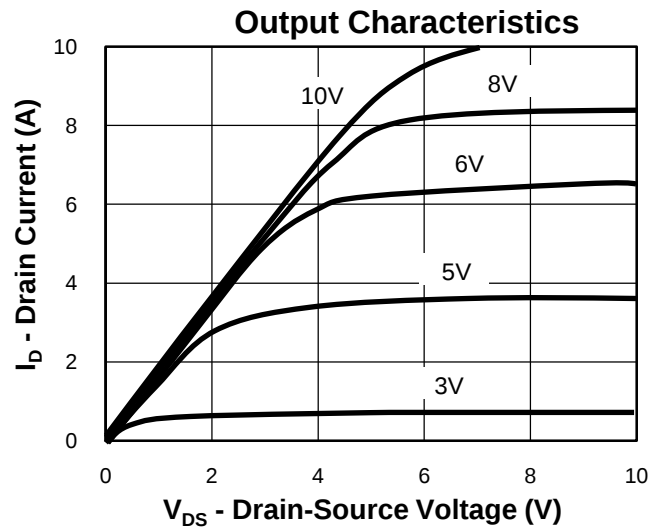
Typical Characteristics



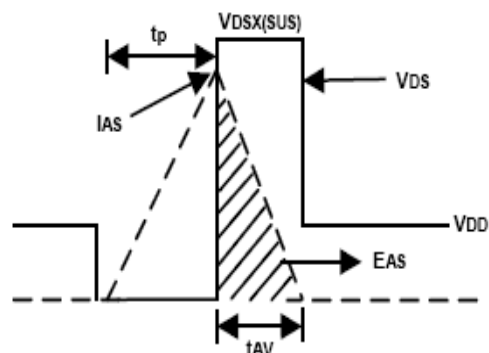
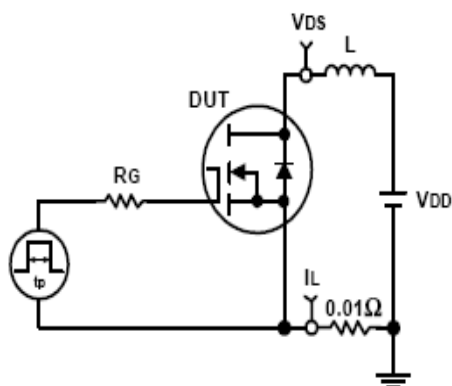
Thermal Transient Impedance



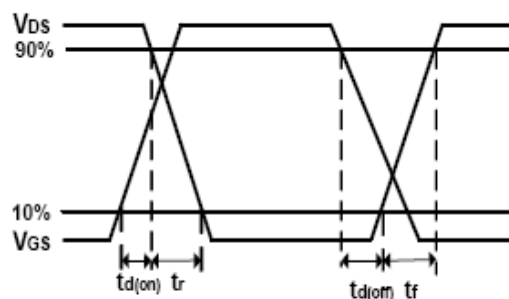
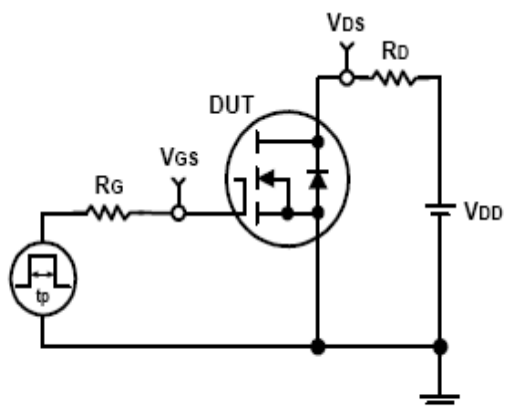
Typical Characteristics



Avalanche Test Circuit and Waveforms

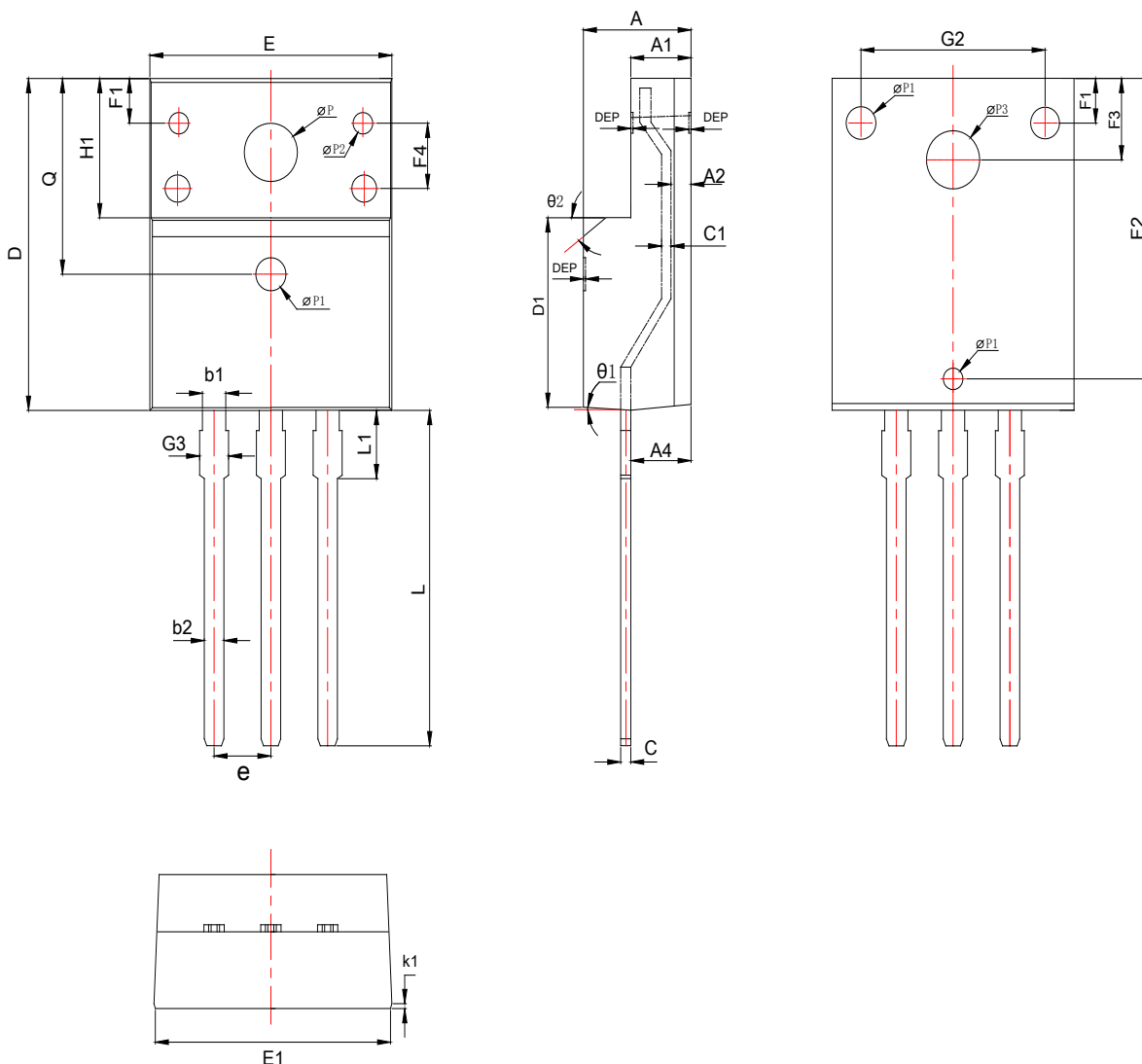


Switching Time Test Circuit and Waveforms



Package Information

TO220F



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
E	9.96	10.16	10.36	0.392	0.400	0.408	$\Phi p2$	1.15	1.20	1.25	0.045	0.047	0.049
A	4.50	4.70	4.90	0.177	0.185	0.193	$\Phi p3$		3.450			0.136	
A1	2.34	2.54	2.74	0.092	0.100	0.108	$\theta 1$	5°	7°	9°	5°	7°	9°
A2	0.95	1.05	1.15	0.037	0.041	0.045	$\theta 2$		45°			45°	
A4	2.65	2.75	2.85	0.104	0.108	0.112	DEP	0.05	0.10	0.15	0.002	0.004	0.006
c		0.50			0.020		F1	1.90	2.00	2.10	0.075	0.079	0.083
c1		0.50			0.020		F2	13.61	13.81	14.01	0.536	0.544	0.552
D	15.67	15.87	16.07	0.617	0.625	0.633	F3	3.20	3.30	3.40	0.126	0.130	0.134
Q	8.80	9.00	9.20	0.346	0.354	0.362	F4	5.25	5.40	5.55	0.207	0.213	0.219
H1	6.48	6.68	6.88	0.255	0.263	0.271	G2	6.90	7.00	7.10	0.272	0.276	0.280
e		2.54BSC			0.100BSC		G3	1.10	1.30	1.50	0.043	0.051	0.059
Φp		3.183			0.125		b1	1.17	1.21	1.24	0.046	0.047	0.049
L	12.78	12.98	13.18	0.503	0.511	0.519	b2	0.77	0.80	0.85	0.030	0.032	0.033
L1	3.25	3.45	3.65	0.128	0.136	0.144	E1	9.80	10.00	10.20	0.386	0.394	0.402
D1	8.99	9.19	9.39	0.354	0.362	0.370	K1	0.65	0.70	0.75	0.026	0.028	0.030
$\Phi p1$	1.40	1.50	1.60	0.055	0.059	0.063							

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