

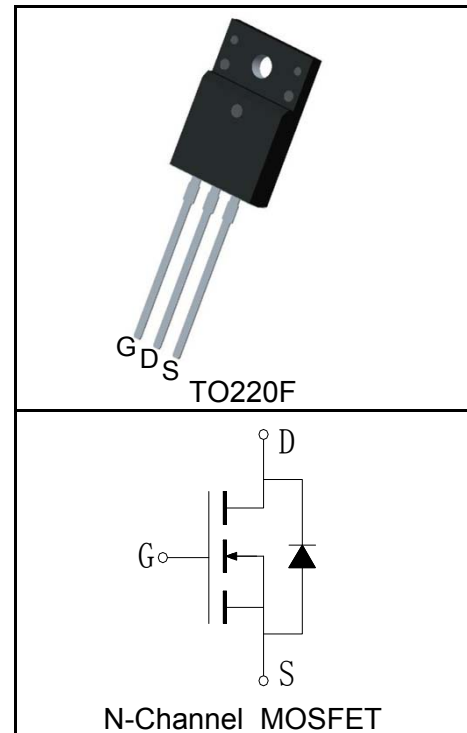
Features

- 650V/12A,
 $R_{DS(ON)} = 340m\Omega(Typ.)@V_{GS}=10V$
- Ultra Low R_{dson}
- Fast Switching
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- AC/DC Power Conversion in Switched Mode Power Supplies (SMPS)
- Adapter
- LED driver

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		650	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	12	A
Mounted on Large Heat Sink				
I _{DP} ^①	300μs Pulse Drain Current Tested	T _C =25°C	48	A
I _D ^②	Continuous Drain Current(V _{GS} =10V)	T _C =25°C	12	A
		T _C =100°C	7.5	
P _D	Maximum Power Dissipation	T _C =25°C	24	W
		T _C =100°C	9.5	
R _{θJC}	Thermal Resistance-Junction to Case		5.3	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^③	Avalanche Energy, Single Pulsed		100	mJ

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

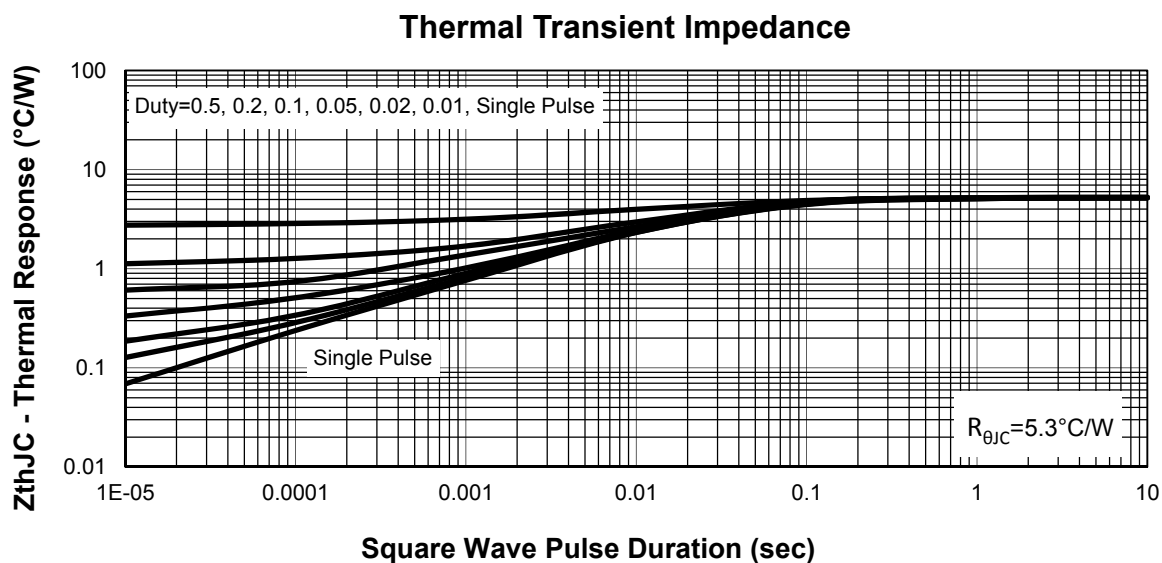
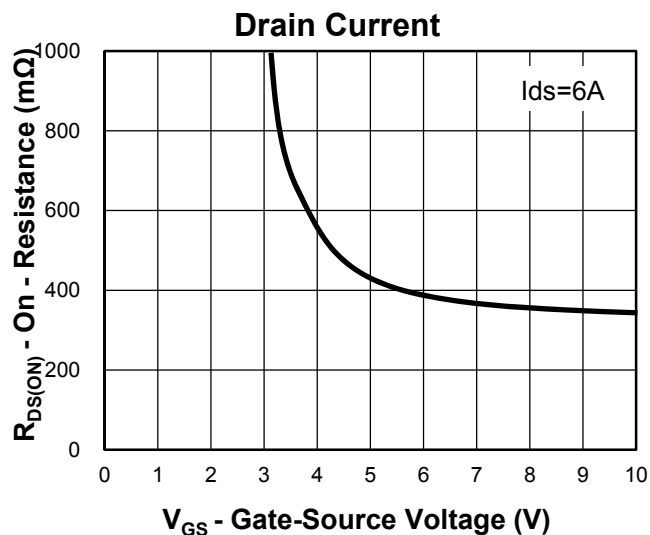
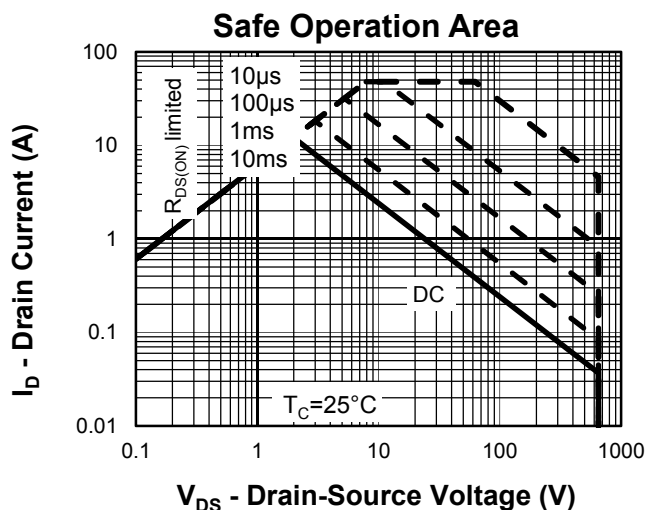
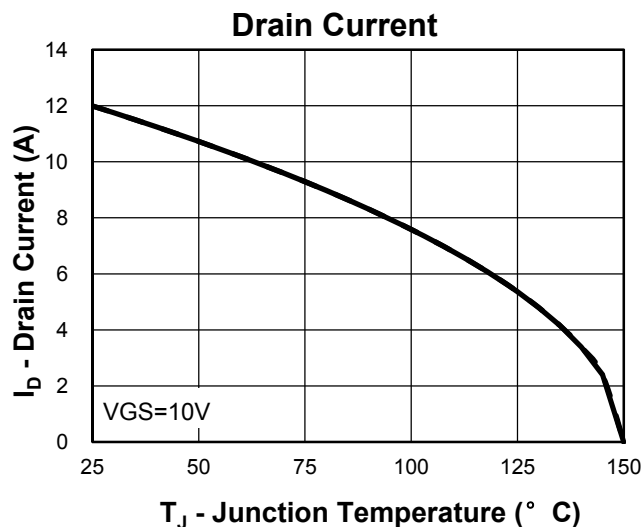
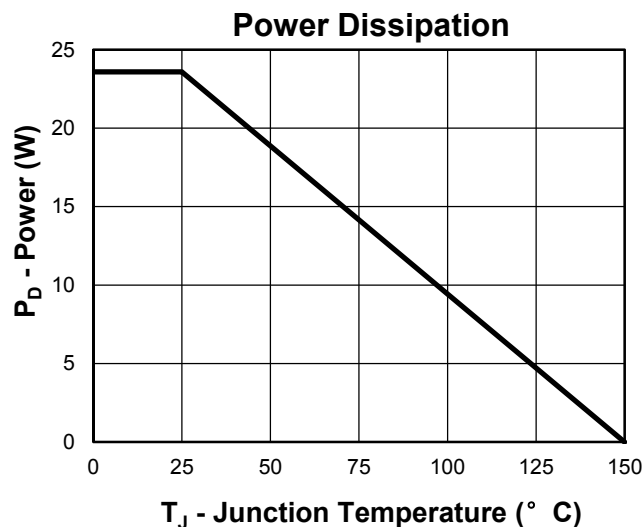
Symbol	Parameter	Test Condition	RU6Z12P			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	650			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650V, V _{GS} =0V			1	μA
			T _J =125°C		30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2		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} =6A		340	400	mΩ
Diode Characteristics						
V _{SD} ④	Diode Forward Voltage	I _{SD} =12A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =12A, dI _{SD} /dt=100A/μs		230		ns
Q _{rr}	Reverse Recovery Charge			2.4		μC
Dynamic Characteristics⑤						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz		4.7		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =300V, Frequency=1.0MHz		530		pF
C _{oss}	Output Capacitance			78		
C _{rss}	Reverse Transfer Capacitance			16		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =300V, R _L =25Ω, I _{DS} =12A, V _{GEN} =10V, R _G =25Ω		19		ns
t _r	Turn-on Rise Time			31		
t _{d(OFF)}	Turn-off Delay Time			41		
t _f	Turn-off Fall Time			23		
Gate Charge Characteristics⑤						
Q _g	Total Gate Charge	V _{DS} =520V, V _{GS} =10V, I _{DS} =12A		16		nC
Q _{gs}	Gate-Source Charge			4		
Q _{gd}	Gate-Drain Charge			7		

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature.
 - ③ Limited by T_{Jmax} , $I_{AS}=4.5A$, $V_{DD}=100V$, $R_G=50\Omega$, 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.

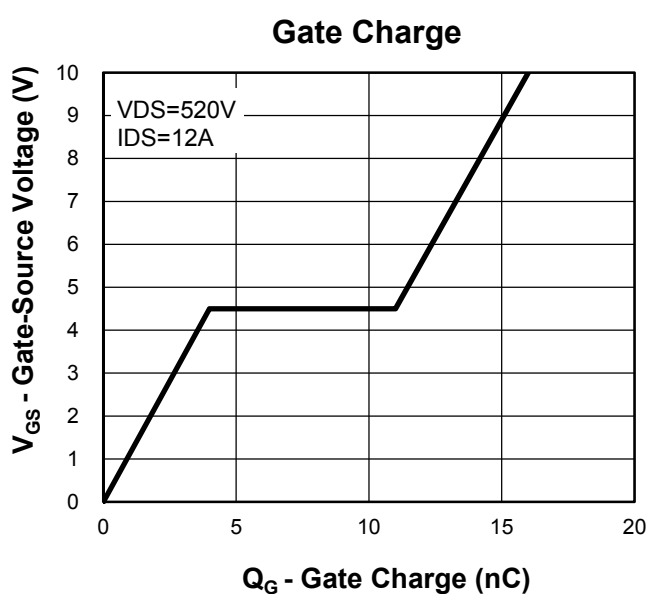
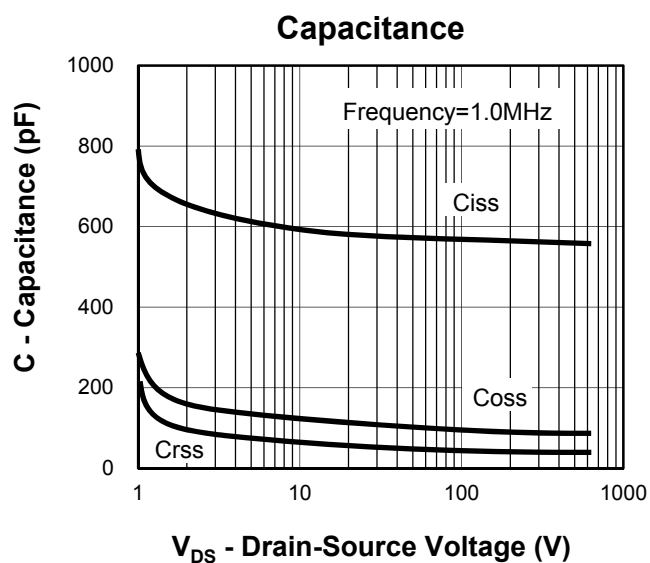
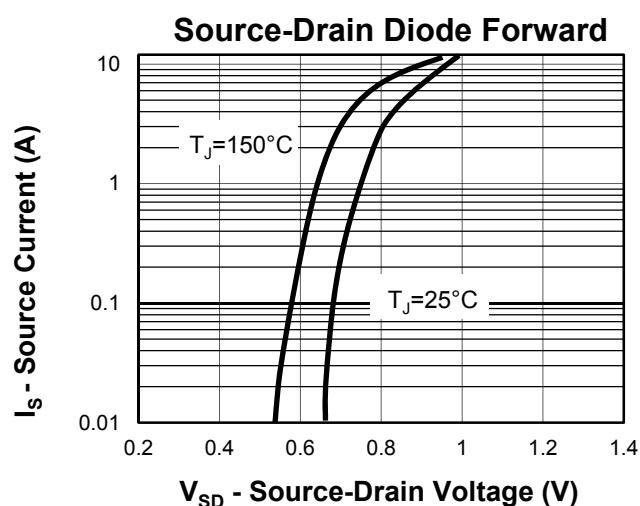
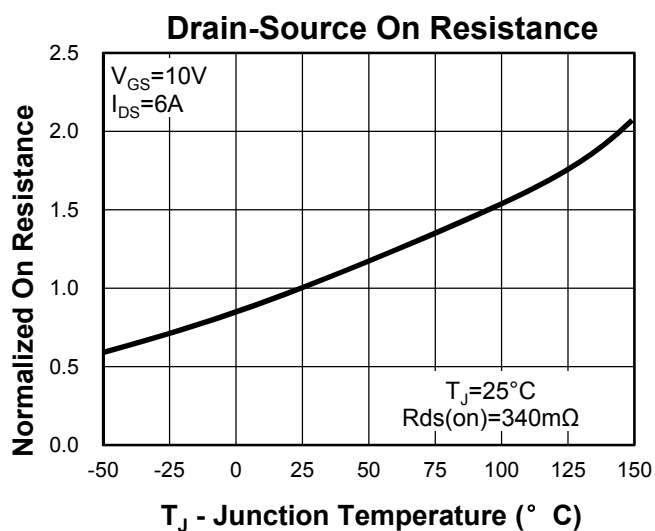
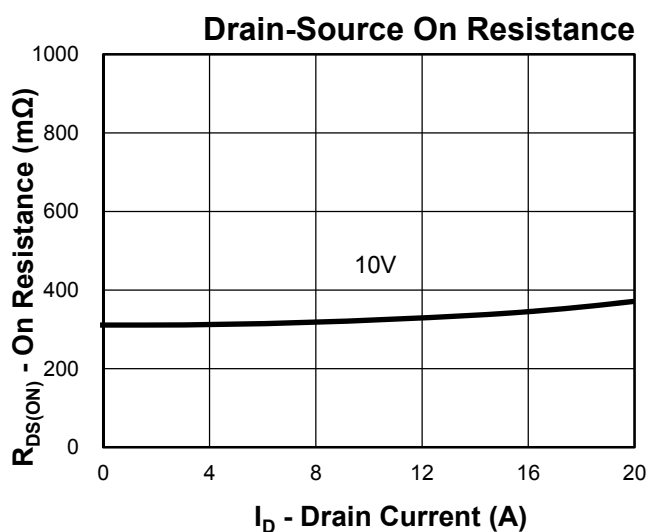
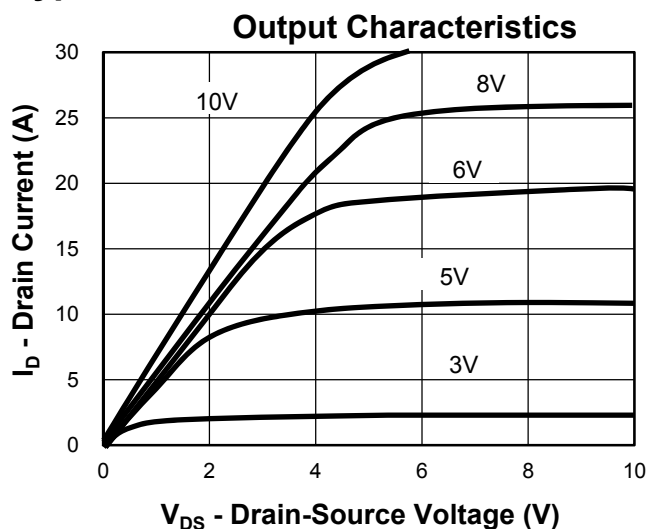
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU6Z12P	RU6Z12P	TO220F	Tube	50	-	-

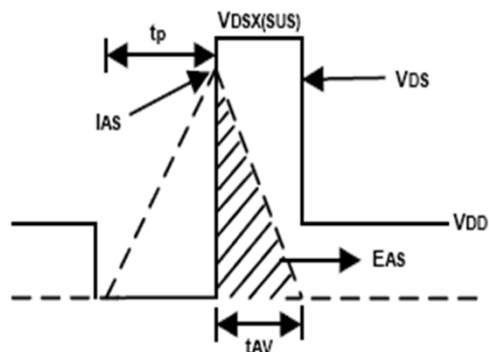
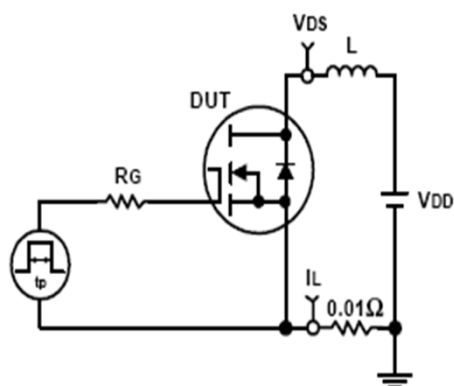
Typical Characteristics



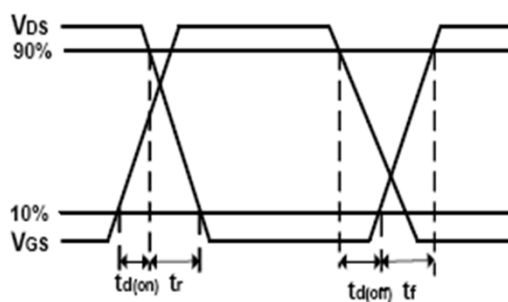
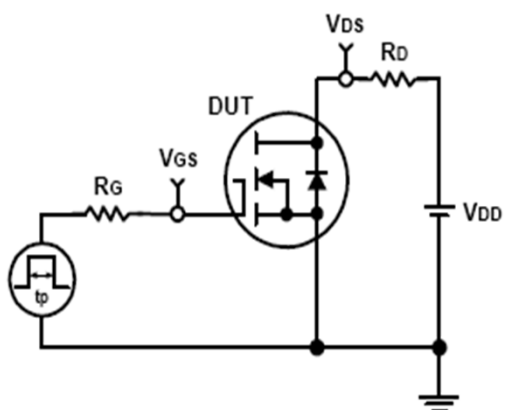
Typical Characteristics



Avalanche Test Circuit and Waveforms

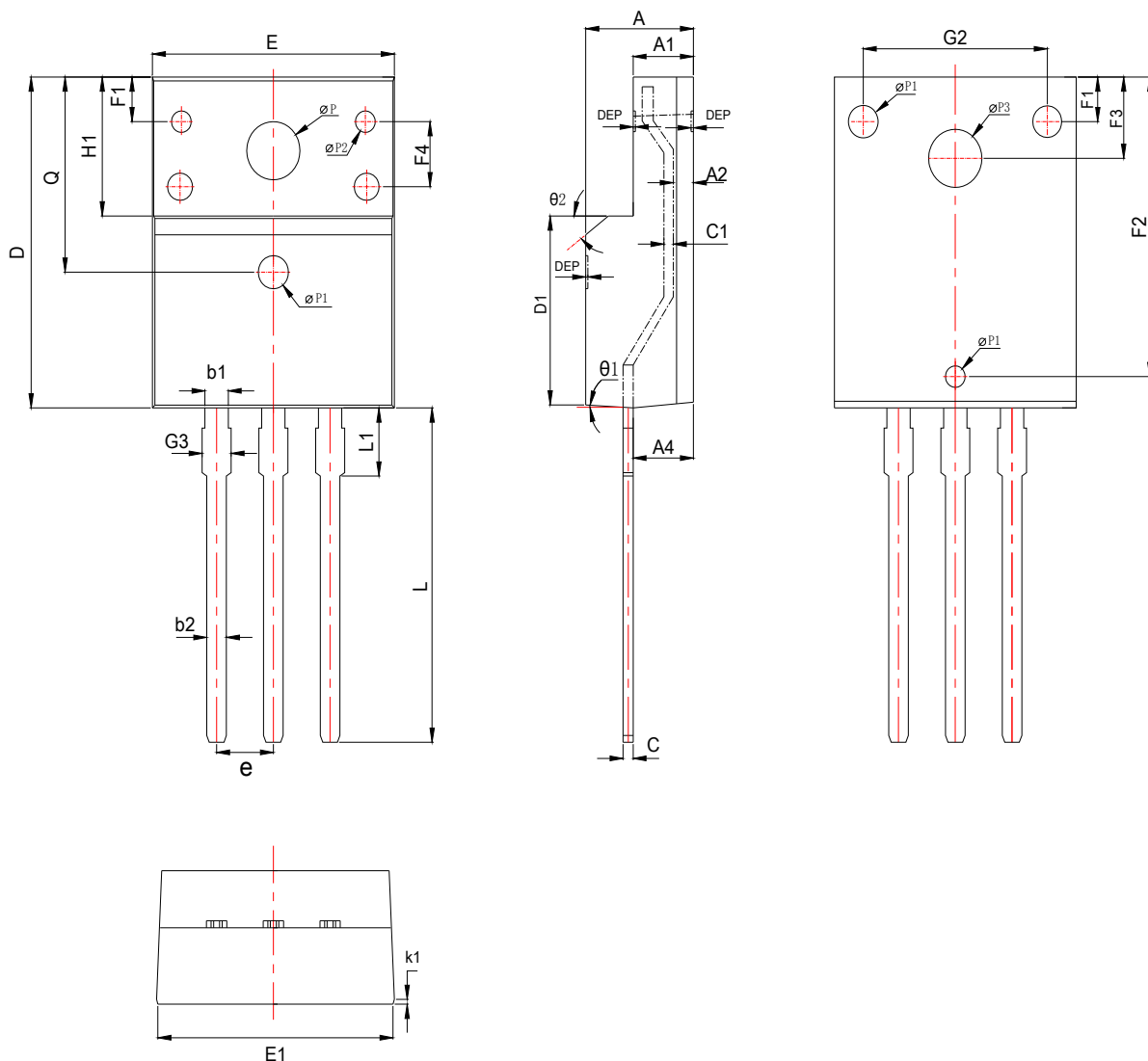


Switching Time Test Circuit and Waveforms



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	Φp2	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	Φp3		3.450			0.136	
A1	2.34	2.54	2.74	0.092	0.100	0.108	θ 1	5°	7°	9°	5°	7°	9°
A2	0.95	1.05	1.15	0.037	0.041	0.045	θ 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
Φp1	1.40	1.50	1.60	0.055	0.059	0.063							

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