

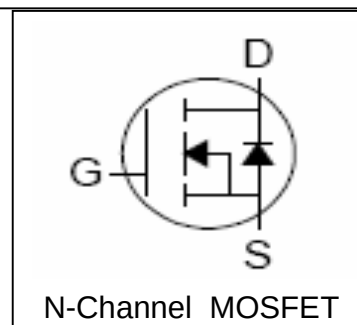
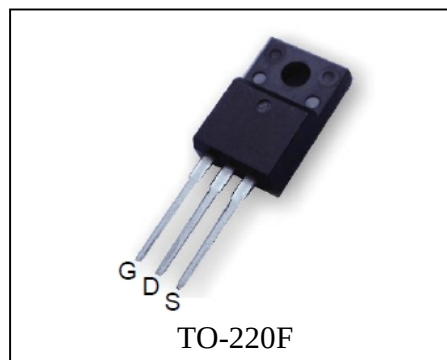
Features

- 400V/10A,
 $R_{DS(ON)} = 0.45\Omega$ (Typ.) @ $V_{GS} = 10V$
- Gate charge minimized
- Low C_{rss} (Typ. 18pF)
- Extremely high dv/dt capability
- 100% avalanche tested
- Lead Free and Green Available

Applications

- High efficiency switch mode power supplies
- Lighting

Pin Description



Absolute Maximum Ratings

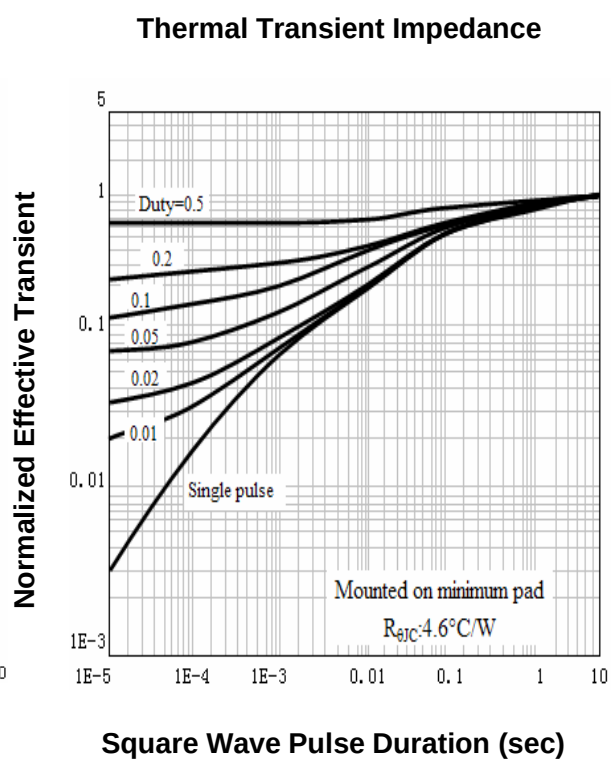
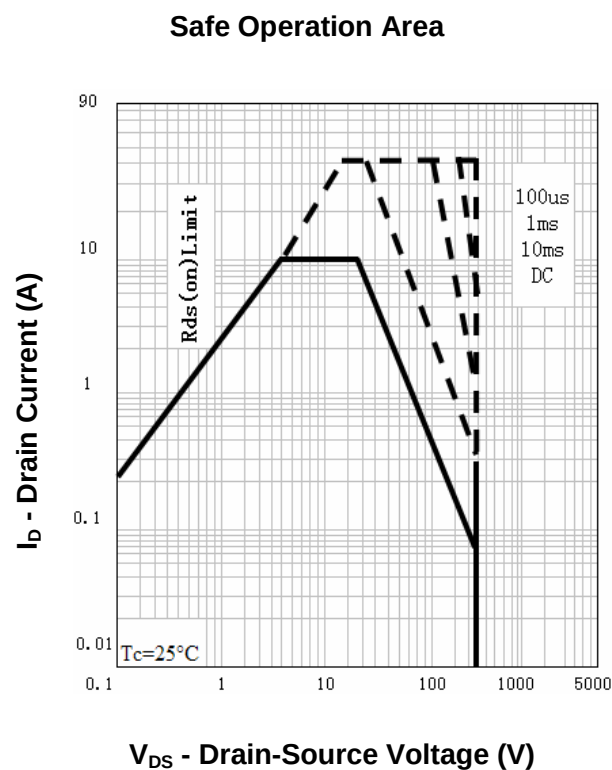
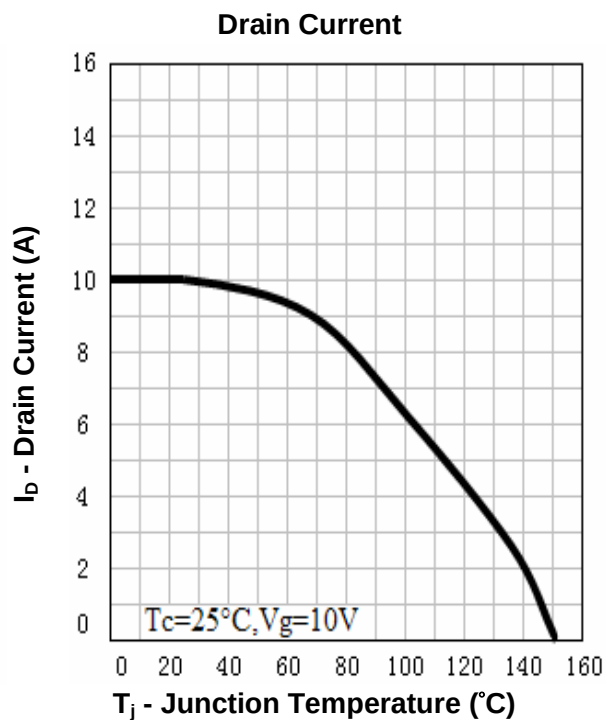
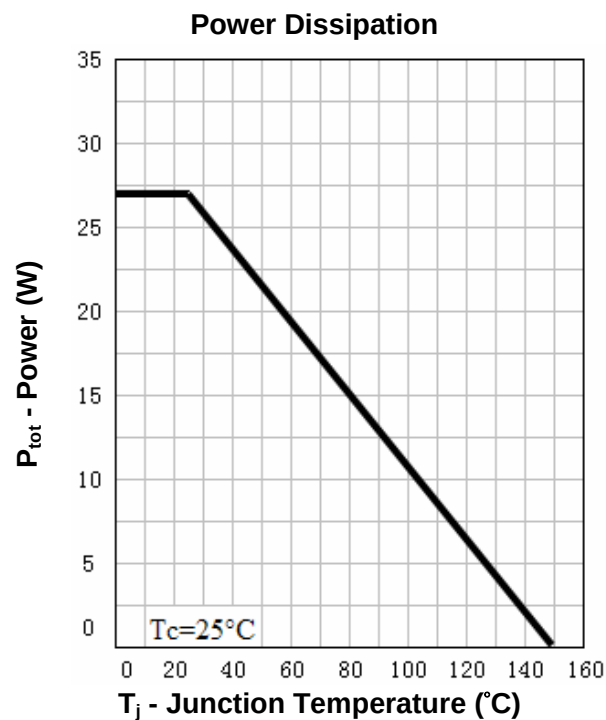
Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		400	V
V _{GSS}	Gate-Source Voltage		±30	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	10	A
Mounted on Large Heat Sink				
I _{DP}	300μs Pulse Drain Current Tested	T _C =25°C	40 ^①	A
I _D	Continuous Drain Current	T _C =25°C	10 ^①	A
		T _C =100°C	6.4 ^①	
P _D	Maximum Power Dissipation	T _C =25°C	27	W
		T _C =100°C	11	
R _{θJC}	Thermal Resistance-Junction to Case		4.6	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^②	Avalanche Energy, Single Pulsed		100	mJ

Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU4H10P			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	400			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 400V, V _{GS} =0V			1	μA
		T _J =85°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)} ③	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =5A		0.45	0.55	Ω
Diode Characteristics						
V _{SD} ③	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =10A, dI _{SD} /dt=100A/μs		250		ns
Q _{rr}	Reverse Recovery Charge			2.3		μC
Dynamic Characteristics ④						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		10		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} = 200V, Frequency=1.0MHz		1060		pF
C _{oss}	Output Capacitance			175		
C _{rss}	Reverse Transfer Capacitance			23		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =200V, R _L =20Ω, I _{DS} =10A, V _{GEN} = 10V, R _G =25Ω		15		ns
t _r	Turn-on Rise Time			22		
t _{d(OFF)}	Turn-off Delay Time			55		
t _f	Turn-off Fall Time			22		
Gate Charge Characteristics ④						
Q _g	Total Gate Charge	V _{DS} =320V, V _{GS} = 10V, I _{DS} =10A		23		nC
Q _{gs}	Gate-Source Charge			3.5		
Q _{gd}	Gate-Drain Charge			9		

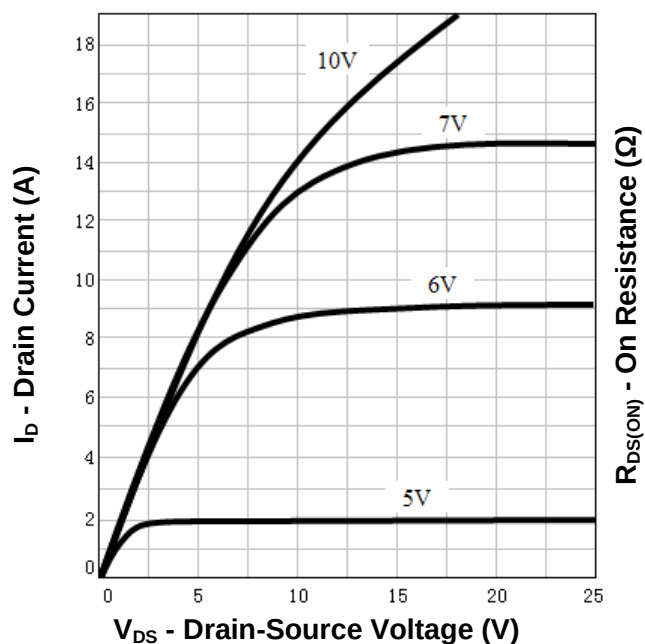
- Notes: ① Current limited by maximum junction temperature.
 ② Limited by T_{Jmax}, I_{AS} =14A, V_{DD} = 100V, R_G = 50Ω , Starting T_J = 25°C.
 ③ Pulse test ; Pulse width≤300μs, duty cycle≤2%.
 ④ Guaranteed by design, not subject to production testing.

Typical Characteristics

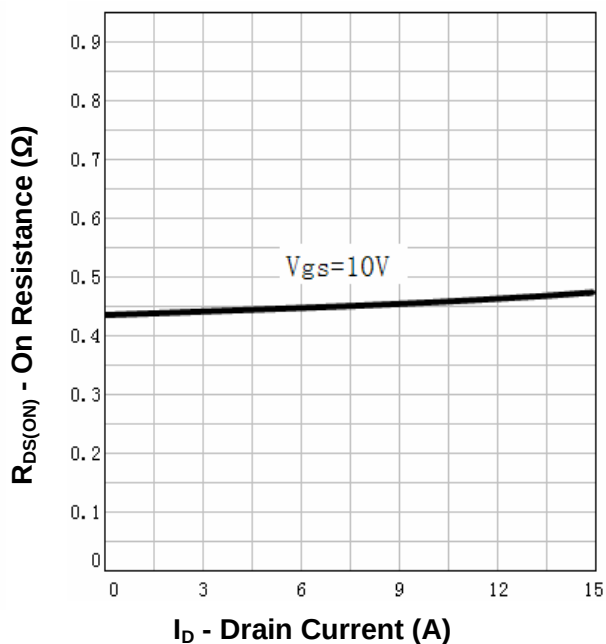


Typical Characteristics

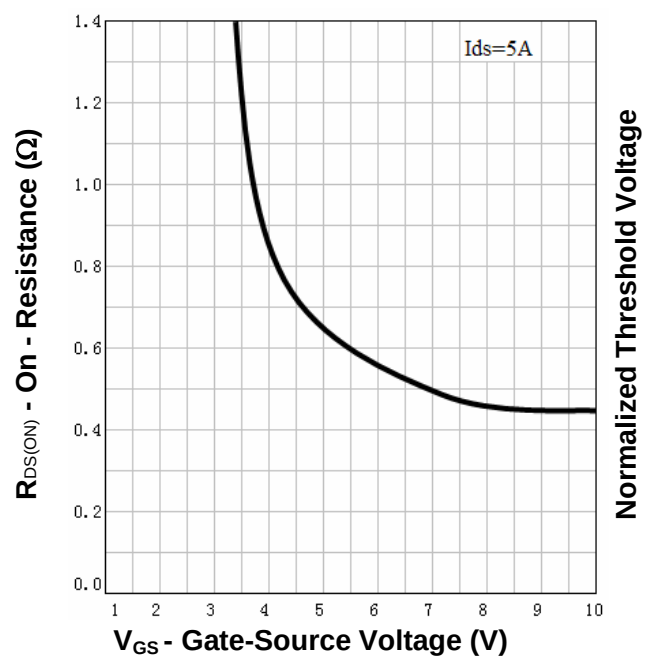
Output Characteristics



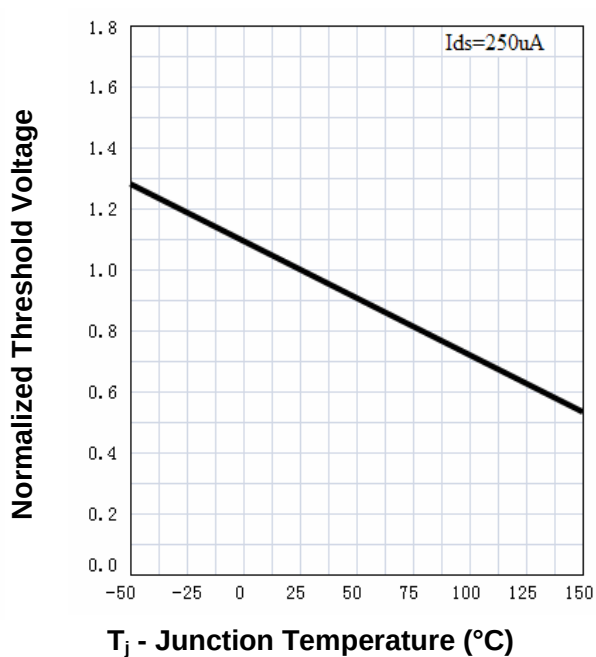
Drain-Source On Resistance



Drain-Source On Resistance

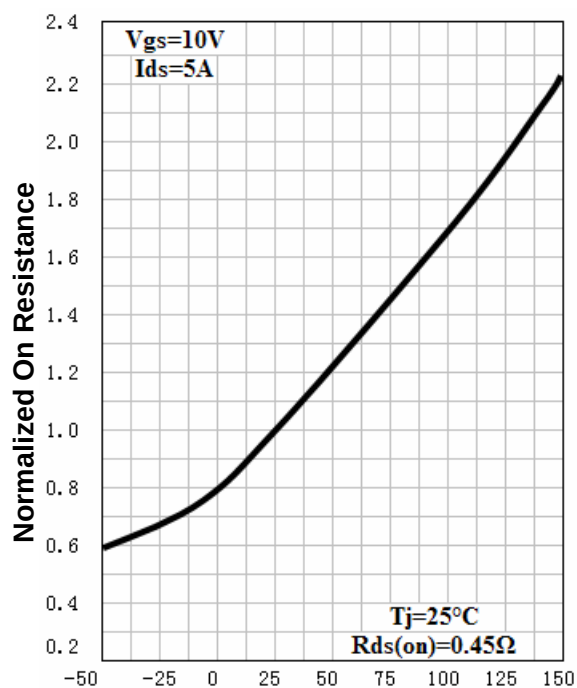


Gate Threshold Voltage



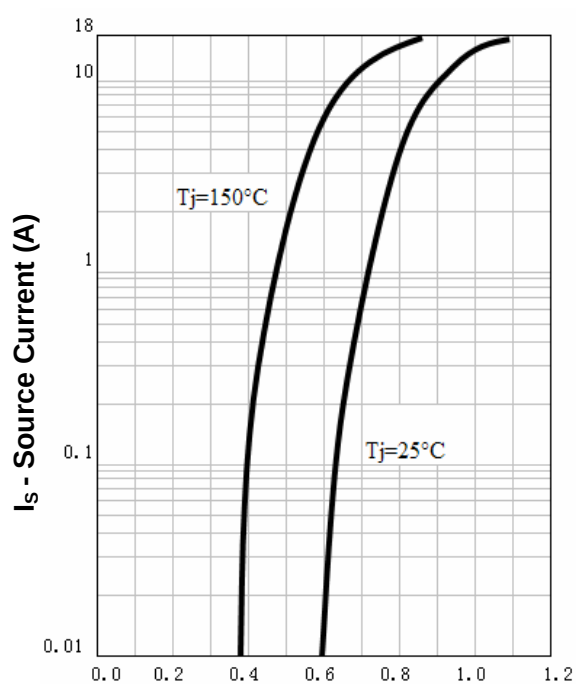
Typical Characteristics

Drain-Source On Resistance



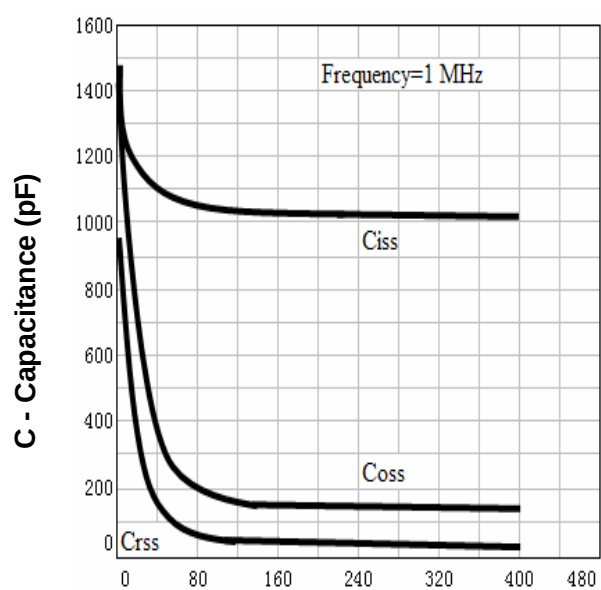
T_j - Junction Temperature ($^{\circ}\text{C}$)

Source-Drain Diode Forward



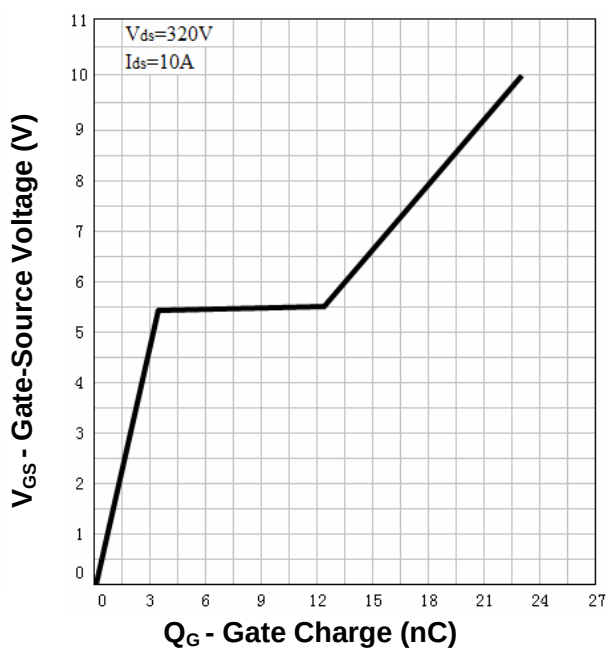
V_{SD} - Source-Drain Voltage (V)

Capacitance

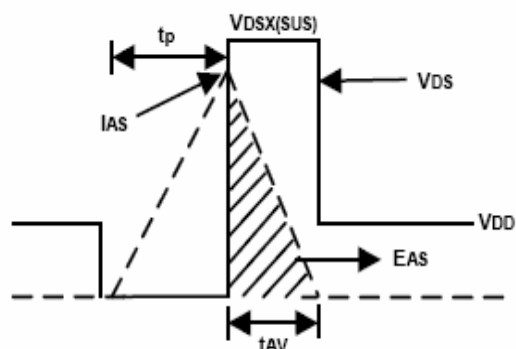
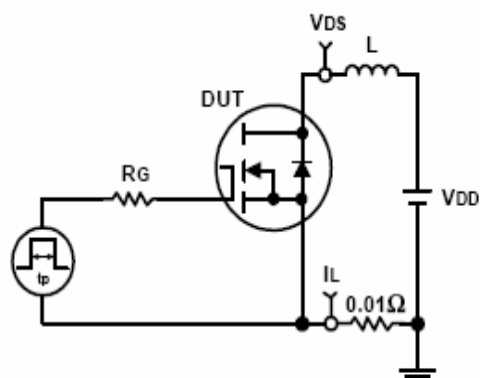


V_{DS} - Drain-Source Voltage (V)

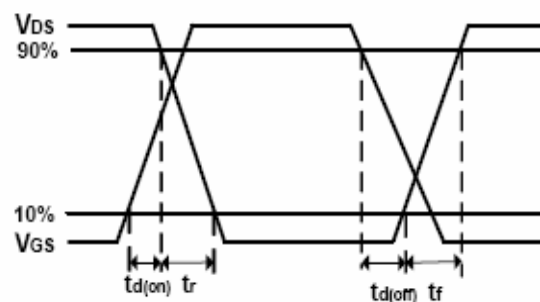
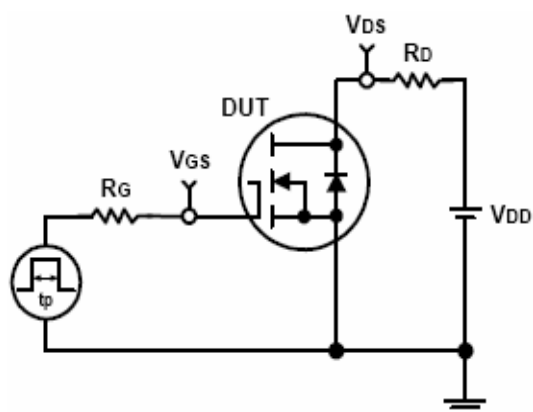
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

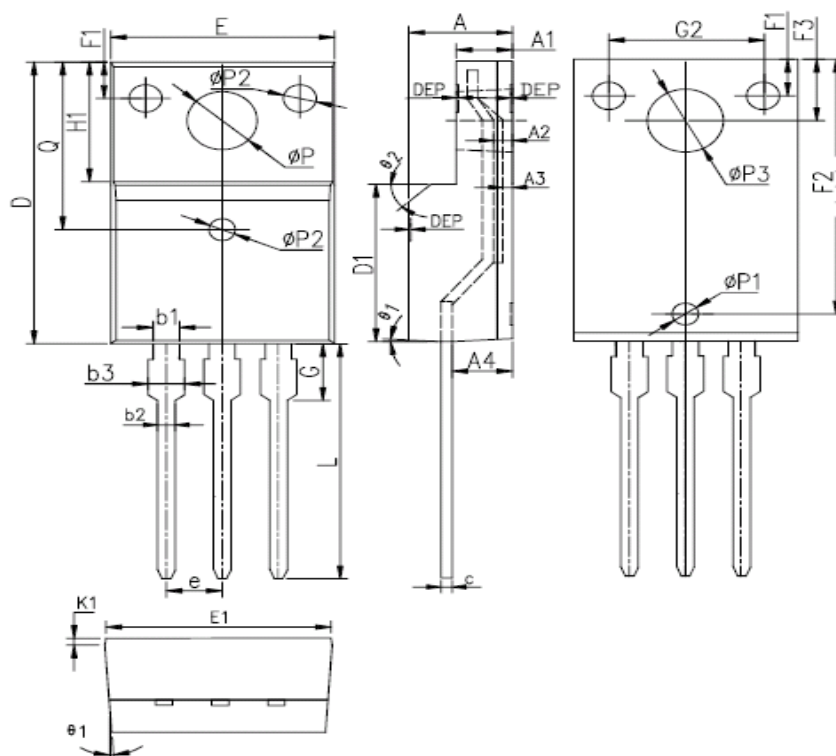


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU4H10P	RU4H10P	TO-220F	Tube	50	-	-

Package Information

TO-220F-3L



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	Øp3	-	3.450	-	-	0.136	-
A	4.50	4.70	4.90	0.177	0.185	0.193	θ 1	5°	7°	9°	5°	7°	9°
A1	2.34	2.54	2.74	0.092	0.100	0.108	θ 2	-	45°	-	-	45°	-
A2	0.95	1.05	1.15	0.037	0.041	0.045	DEP	0.05	0.10	0.15	0.002	0.004	0.006
A3	0.42	0.52	0.62	0.017	0.020	0.024	F1	1.90	2.00	2.10	0.075	0.079	0.083
A4	2.65	2.75	2.85	0.104	0.108	0.112	F2	13.61	13.81	14.01	0.536	0.544	0.552
c	-	0.50	-	-	0.020	-	F3	3.20	3.30	3.40	0.126	0.130	0.134
D	15.67	15.87	16.07	0.617	0.625	0.633	G	3.25	3.45	3.65	0.128	0.136	0.144
Q	8.80	9.00	9.20	0.346	0.354	0.362	G1	5.90	6.00	6.10	0.232	0.236	0.240
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			0.1BSC			b1	1.17	1.20	1.24	0.046	0.047	0.048
Øp	-	3.183	-	-	0.125	-	b2	0.77	0.8	0.85	0.030	0.031	0.033
L	12.78	12.98	13.18	0.503	0.511	0.519	b3	1.10	1.30	1.50	0.043	0.051	0.059
D1	8.99	9.19	9.39	0.354	0.362	0.370	E1	9.8	10.00	10.20	0.386	0.394	0.412
Øp1	1.40	1.50	1.60	0.055	0.059	0.063	K1	0.75	0.8	0.85	0.030	0.031	0.033
Øp2	1.15	1.20	1.25	0.045	0.047	0.049							

ALL DIMENSIONS REFER TO JEDEC STANDARD
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

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