

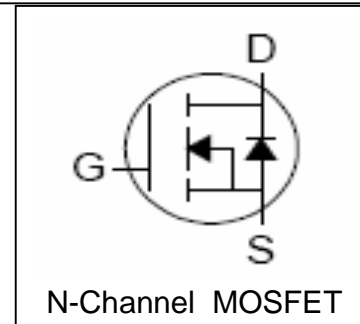
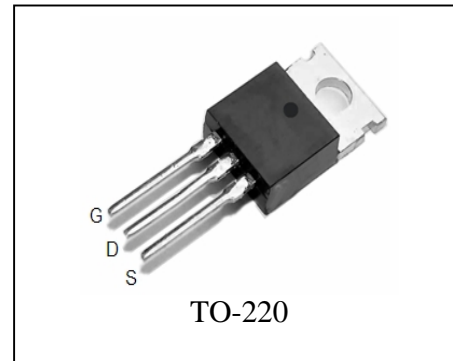
Features

- 500V/8A,
 $R_{DS(ON)} = 0.7\Omega$ (Typ.) @ $V_{GS} = 10V$
- Gate charge minimized
- Low C_{rss} (Typ. 26pF)
- 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

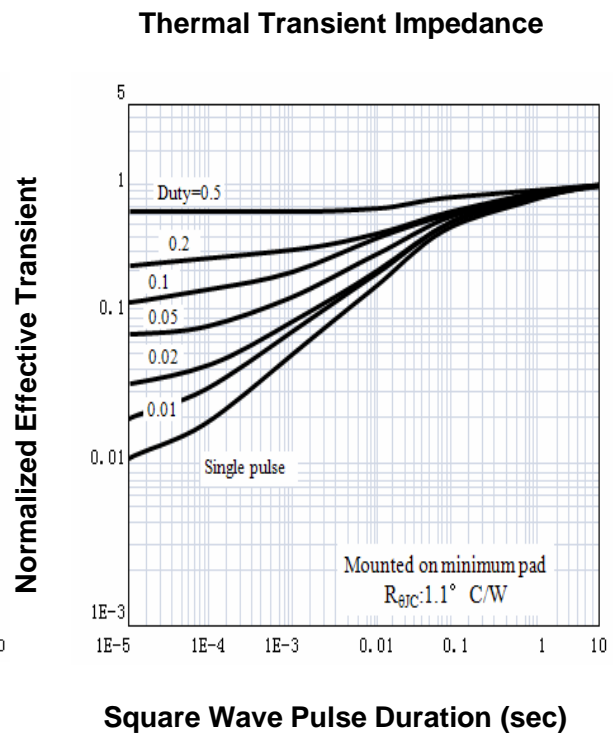
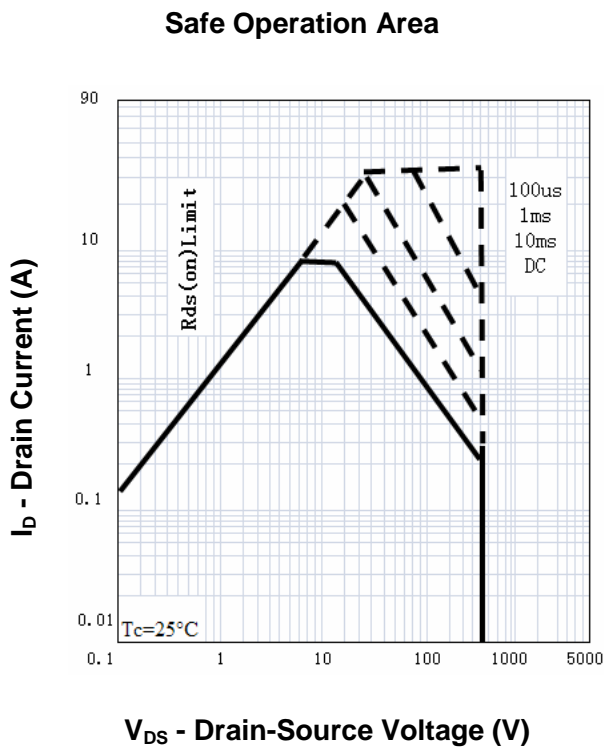
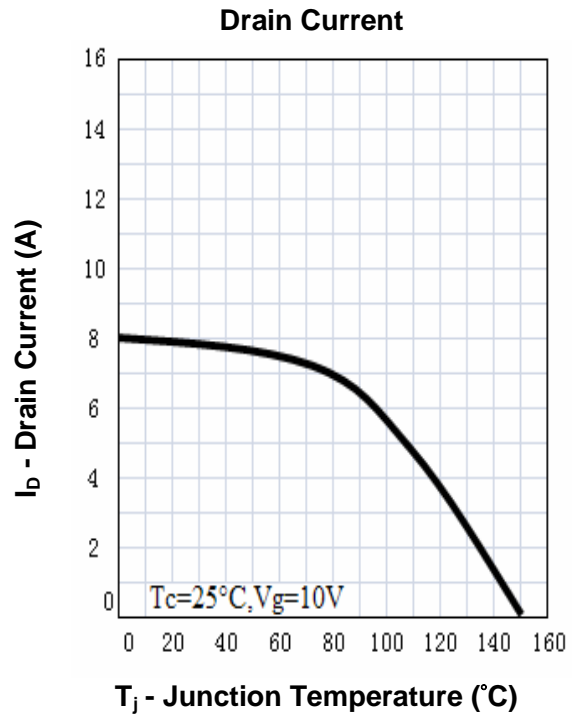
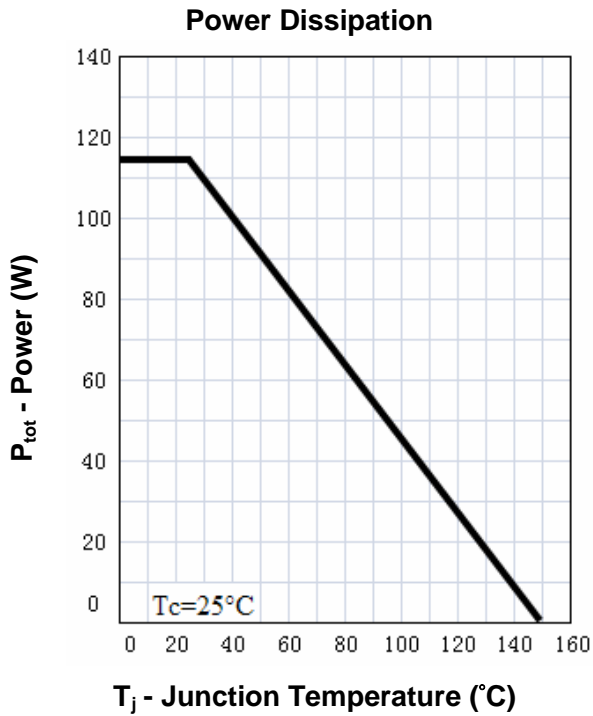
Symbol	Parameter	Rating	Unit
Common Ratings ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	500	V
V_{GSS}	Gate-Source Voltage	± 30	
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C = 25^\circ\text{C}$ 8	A
Mounted on Large Heat Sink			
I_{DP}	300 μs Pulse Drain Current Tested	$T_C = 25^\circ\text{C}$ 32 ^①	A
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$ 8 ^①	A
		$T_C = 100^\circ\text{C}$ 5.6 ^①	
P_D	Maximum Power Dissipation	$T_C = 25^\circ\text{C}$ 114	W
		$T_C = 100^\circ\text{C}$ 45	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.1	$^\circ\text{C/W}$
Drain-Source Avalanche Ratings			
E_{AS} ^②	Avalanche Energy, Single Pulsed	78	mJ

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

Symbol	Parameter	Test Condition	RU5H8R			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	500			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=500V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			1	μA
					30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2	3	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(3)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=4A$		0.7	0.85	Ω
Diode Characteristics						
$V_{SD}^{(3)}$	Diode Forward Voltage	$I_{SD}=8A, V_{GS}=0V$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=8A, dI_{SD}/dt=100A/\mu s$		310		ns
Q_{rr}	Reverse Recovery Charge			2.3		μC
Dynamic Characteristics ⁽⁴⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		10		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=250V,$ Frequency=1.0MHz		1110		pF
C_{oss}	Output Capacitance			195		
C_{rss}	Reverse Transfer Capacitance			26		
$t_{d(ON)}$	Turn-on Delay Time			30		
t_r	Turn-on Rise Time	$V_{DD}=250V, R_L=32\Omega,$ $I_{DS}=8A, V_{GEN}=10V,$ $R_G=25\Omega$		50		
$t_{d(OFF)}$	Turn-off Delay Time			120		
t_f	Turn-off Fall Time			50		
Gate Charge Characteristics ⁽⁴⁾						
Q_g	Total Gate Charge	$V_{DS}=400V, V_{GS}=10V,$ $I_{DS}=8A$		25		nC
Q_{gs}	Gate-Source Charge			4		
Q_{gd}	Gate-Drain Charge			10		

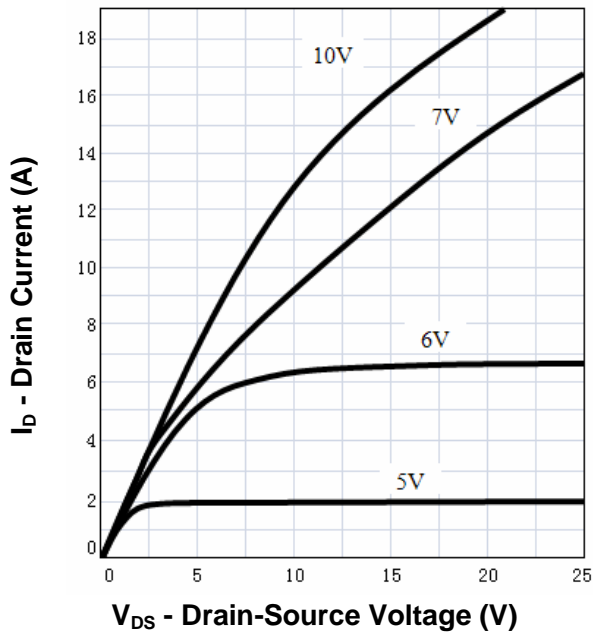
- Notes: ① Current limited by maximum junction temperature.
 ② Limited by $T_{Jmax}, I_{AS}=12.5A, V_{DD}=100V, R_G=50\Omega$, Starting $T_J=25^\circ\text{C}$.
 ③ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 ④ Guaranteed by design, not subject to production testing.

Typical Characteristics

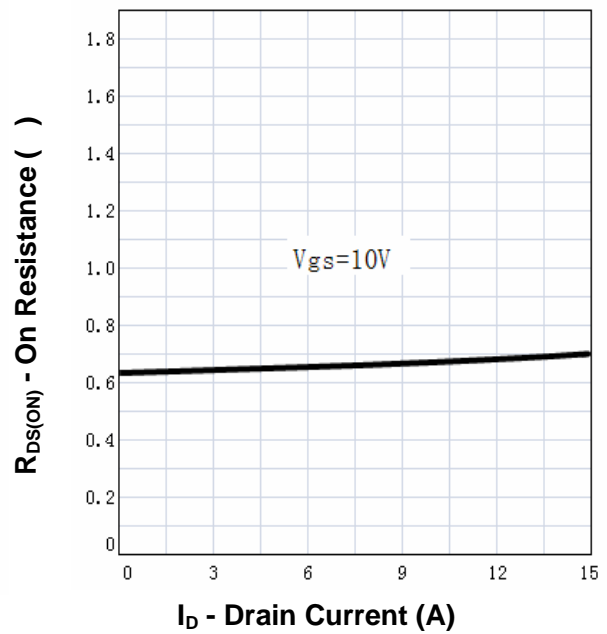


Typical Characteristics

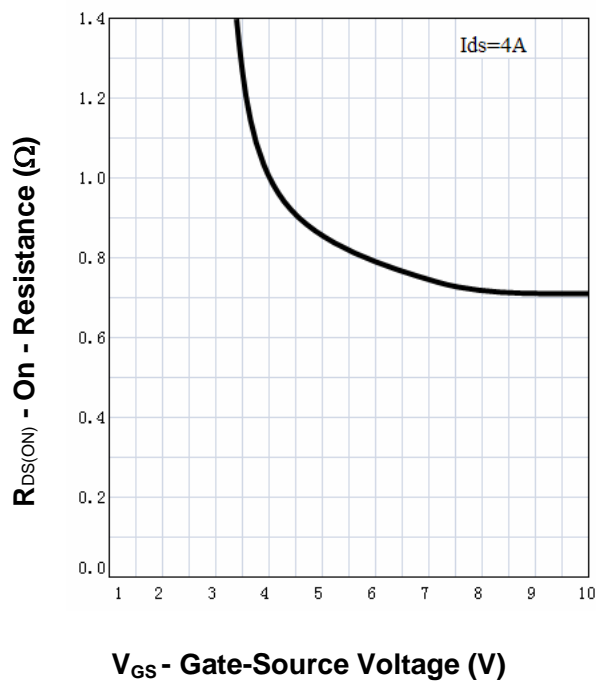
Output Characteristics



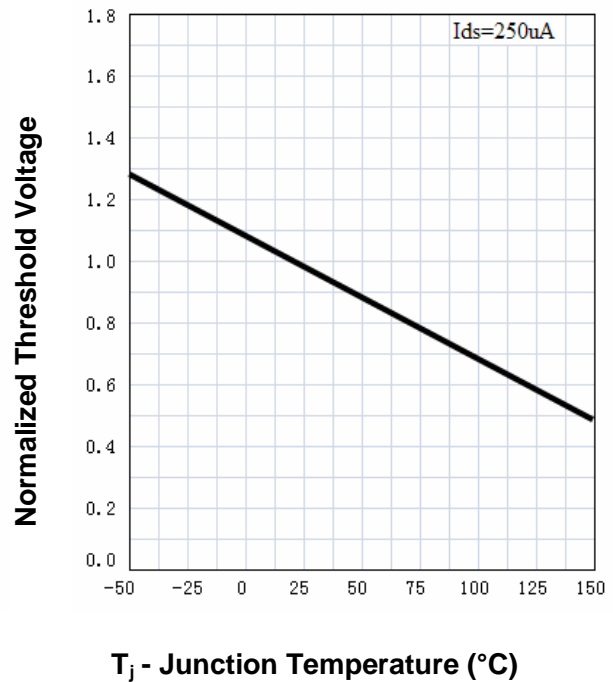
Drain-Source On Resistance



Drain-Source On Resistance

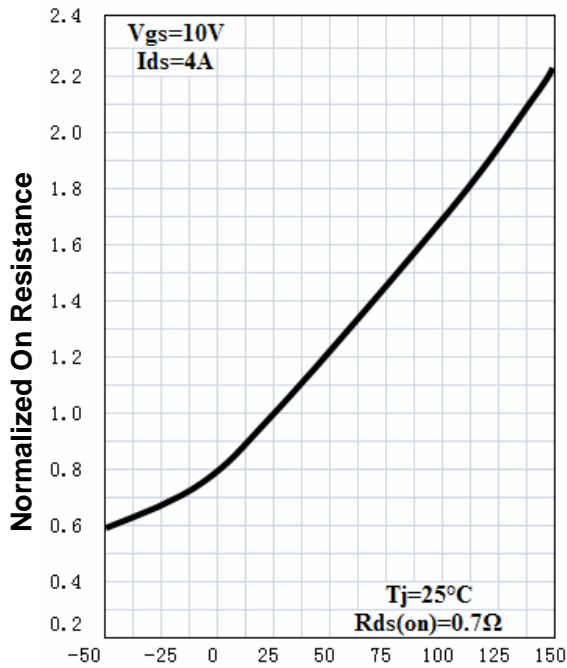


Gate Threshold Voltage



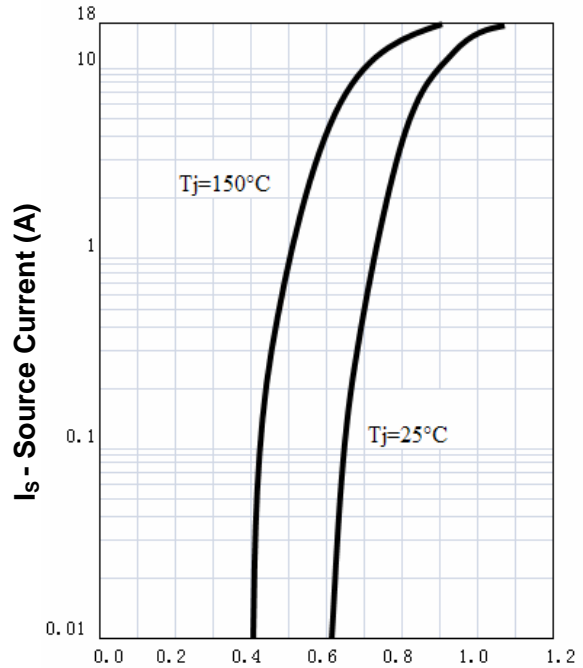
Typical Characteristics

Drain-Source On Resistance



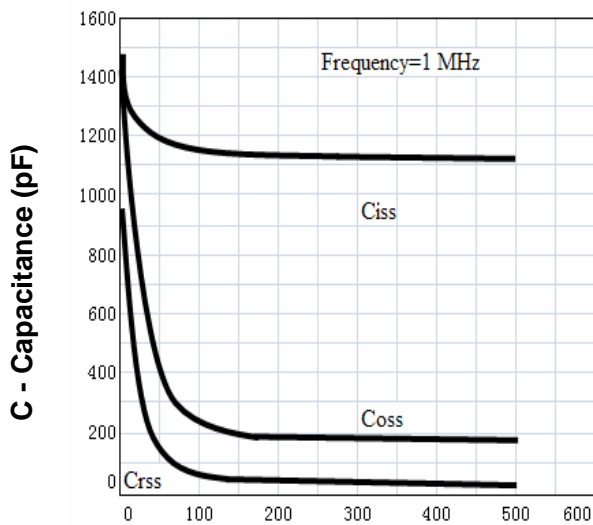
T_j - Junction Temperature (°C)

Source-Drain Diode Forward



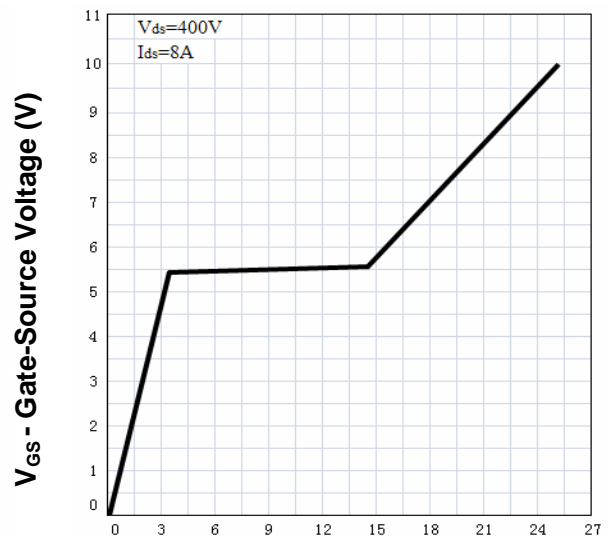
V_{SD} - Source-Drain Voltage (V)

Capacitance



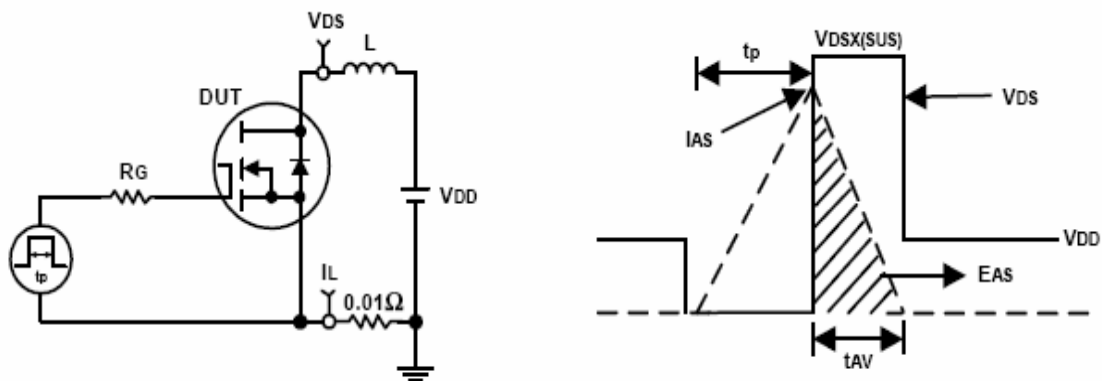
V_{DS} - Drain-Source Voltage (V)

Gate Charge

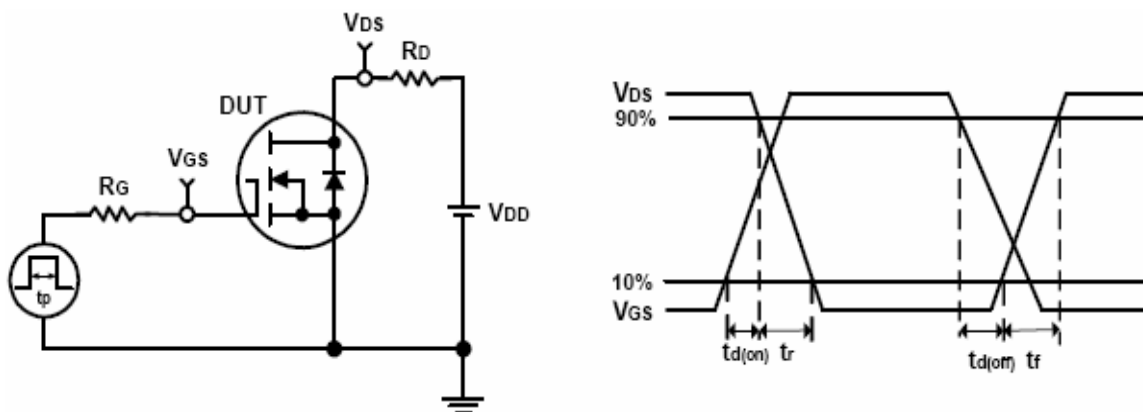


Q_G - Gate Charge (nC)

Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

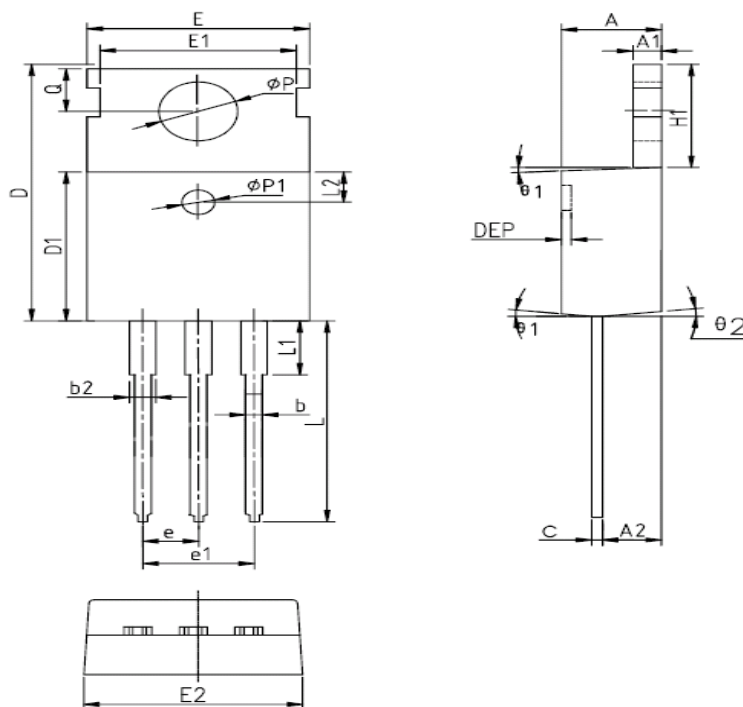


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU5H8R	RU5H8R	TO-220	Tube	50	-	-

Package Information

TO-220FB-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	ϕp_3	-	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
ϕp	-	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
ϕp_1	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
ϕp_2	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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