RU5H18Q

N-Channel Advanced Power MOSFET

Features

•500V/18A,
$R_{DS\,(ON)}$ =0.27Ω (Typ.) @ V_{GS}=10V

• Gate charge minimized

• Low Crss(Typ. 26pF)

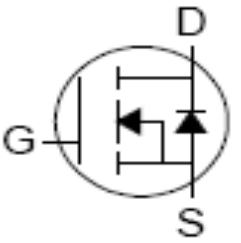
• Extremely high dv/dt capability

• 100% avalanche tested

• Lead Free and Green Available

Pin Description

TO-247



N-Channel MOSFET

Applications

• High efficiency switch mode power supplies
• Lighting

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	18	A
Mounted on Large Heat Sink				
I_{DP}	300μs Pulse Drain Current Tested	T_C=25°C	72①	A
I_D	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	18①	A
		T_C=100°C	13.5①	
P_D	Maximum Power Dissipation	T_C=25°C	290	W
		T_C=100°C	116	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.43	°C/W
Drain-Source Avalanche Ratings				
E_{AS}②	Avalanche Energy, Single Pulsed		162	mJ

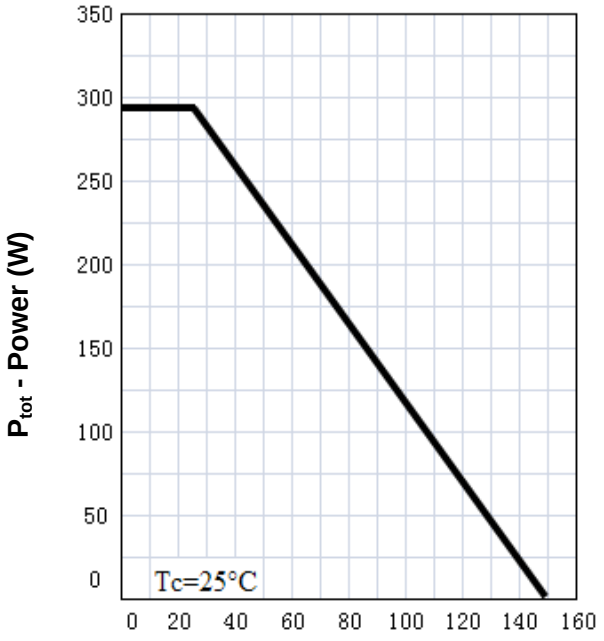
Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU5H18Q			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=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}=9A		0.27	0.32	Ω
Diode Characteristics						
V_{SD} ③	Diode Forward Voltage	I_{SD}=18A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=18A, dI_{SD}/dt=100A/μs		490		ns
Q_{rr}	Reverse Recovery Charge			5.8		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}=250V, Frequency=1.0MHz		2020		pF
C_{oss}	Output Capacitance			250		
C_{rss}	Reverse Transfer Capacitance			26		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=250V, R_L=14Ω, I_{DS}=18A, V_{GEN}=10V, R_G=25Ω		30		ns
t_r	Turn-on Rise Time			45		
$t_{d(OFF)}$	Turn-off Delay Time			110		
t_f	Turn-off Fall Time			45		
Gate Charge Characteristics ④						
Q_g	Total Gate Charge	V_{DS}=400V, V_{GS}=10V, I_{DS}=18A		50		nC
Q_{gs}	Gate-Source Charge			11		
Q_{gd}	Gate-Drain Charge			20		

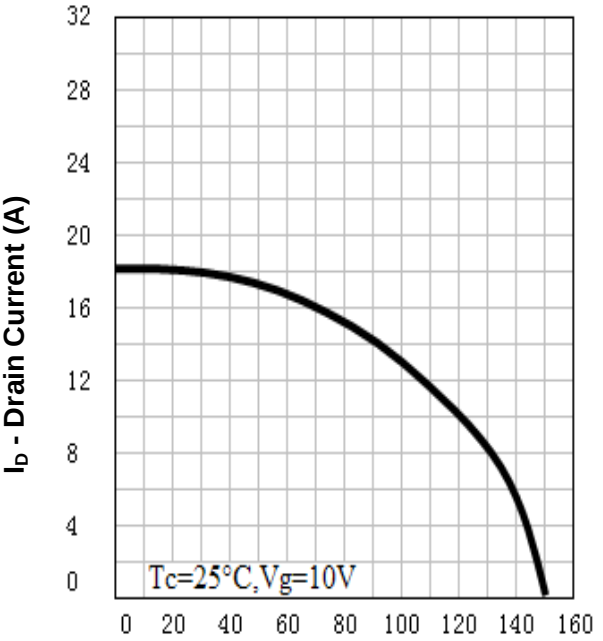
Notes: ①Current limited by maximum junction temperature.
②Limited by T_{Jmax}, I_{AS} =18A, V_{DD} = 100V, R_G = 50Ω , Starting T_J = 25°C.
③Pulse test ; Pulse width≤300μs, duty cycle≤2%.
④Guaranteed by design, not subject to production testing.

Typical Characteristics

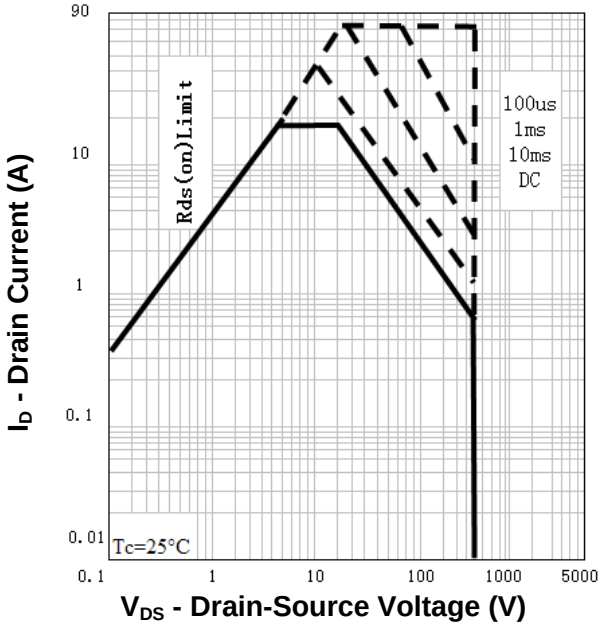
Power Dissipation



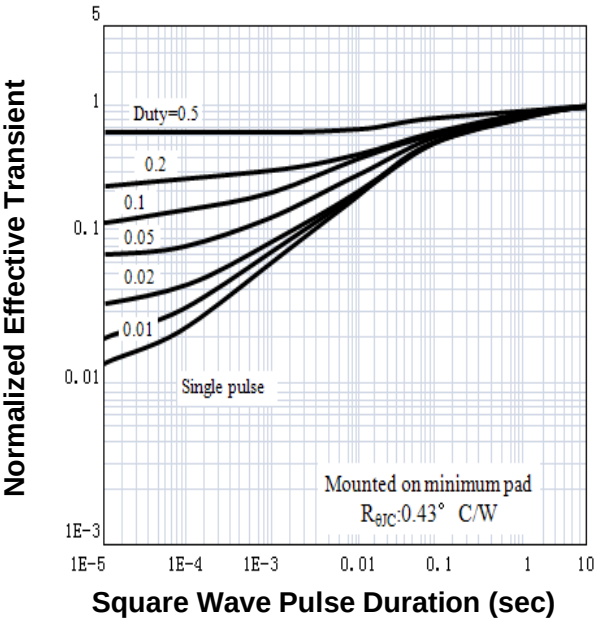
Drain Current



Safe Operation Area

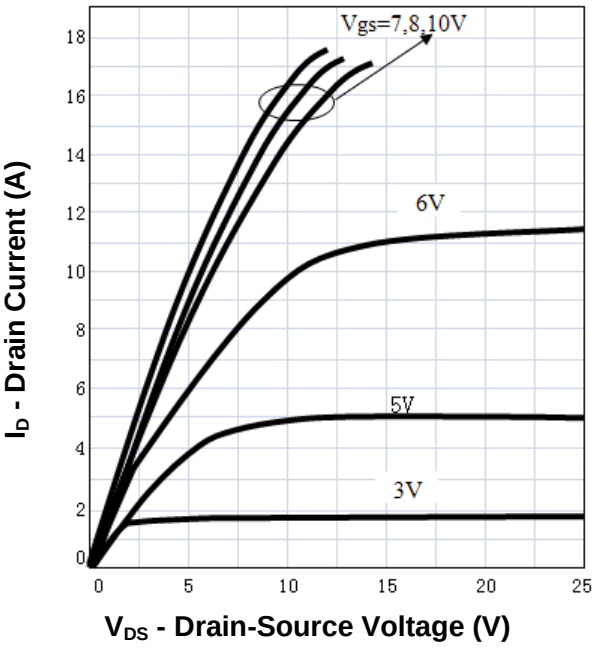


Thermal Transient Impedance

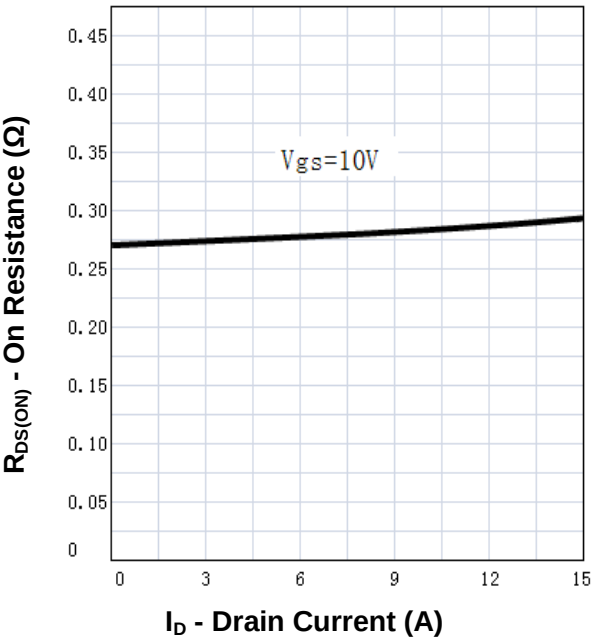


Typical Characteristics

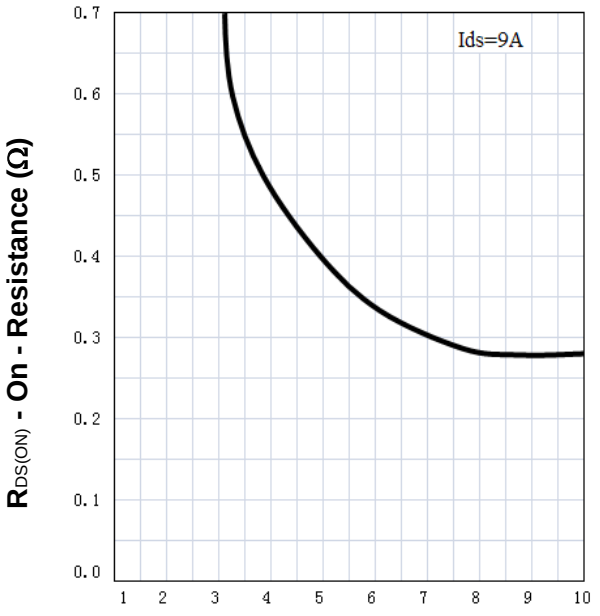
Output Characteristics



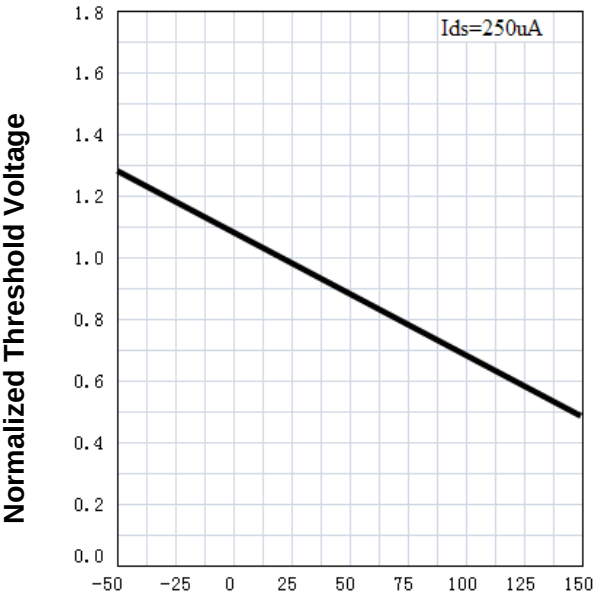
Drain-Source On Resistance



Drain-Source On Resistance

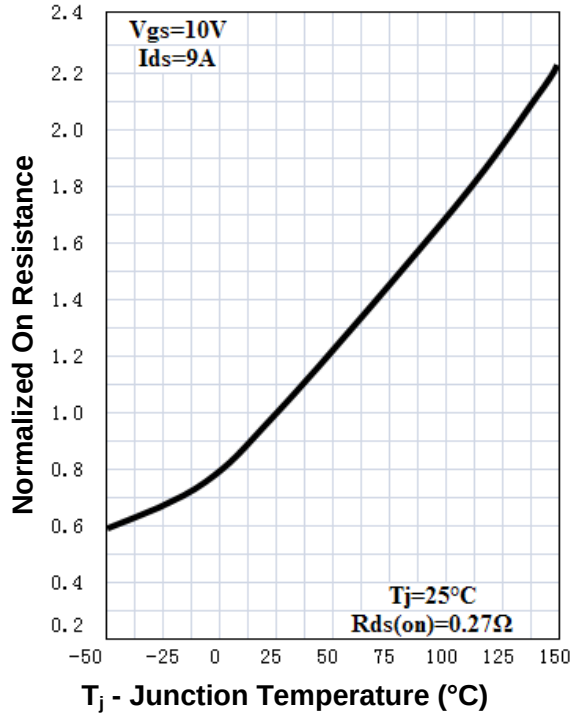


Gate Threshold Voltage

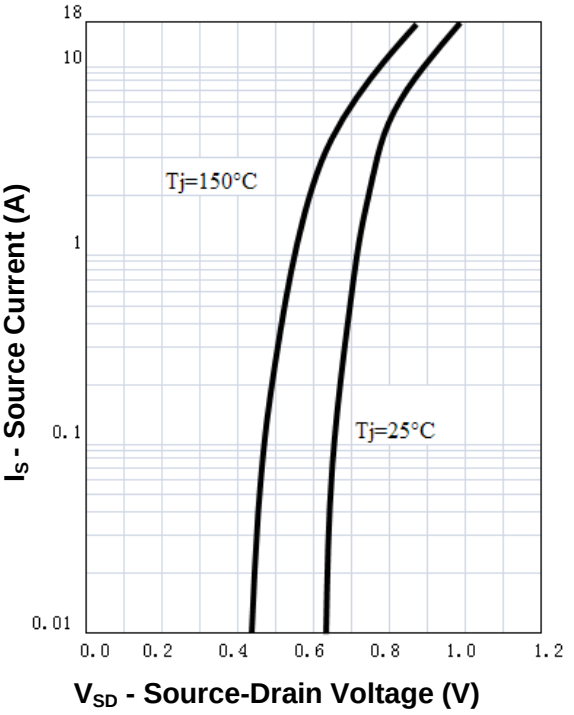


Typical Characteristics

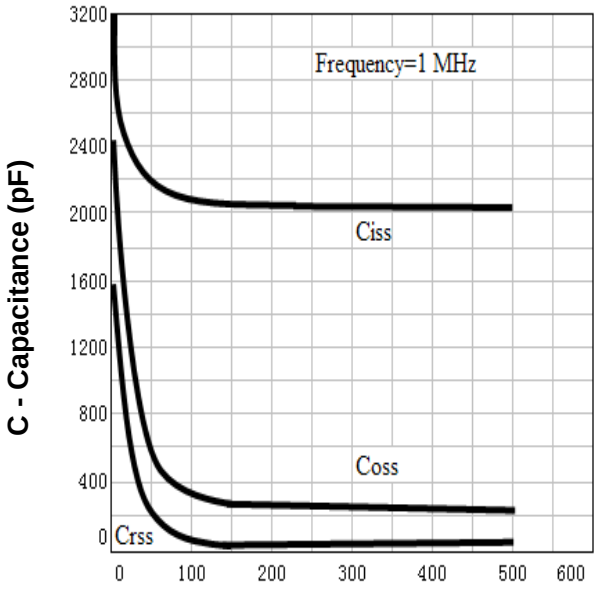
Drain-Source On Resistance



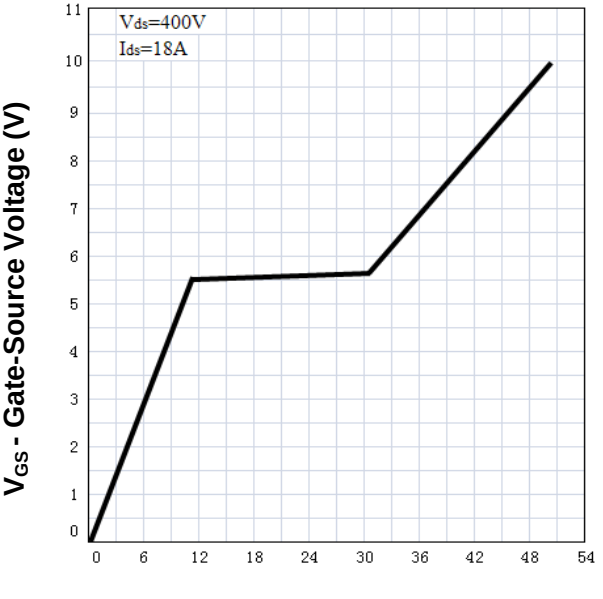
Source-Drain Diode Forward



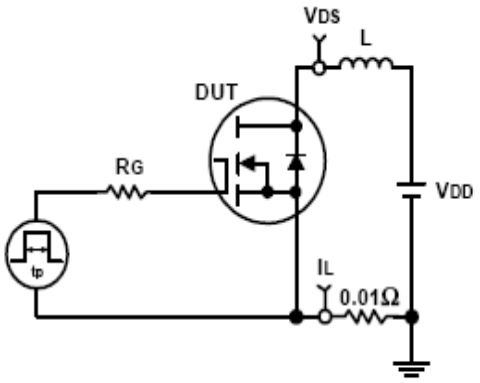
Capacitance

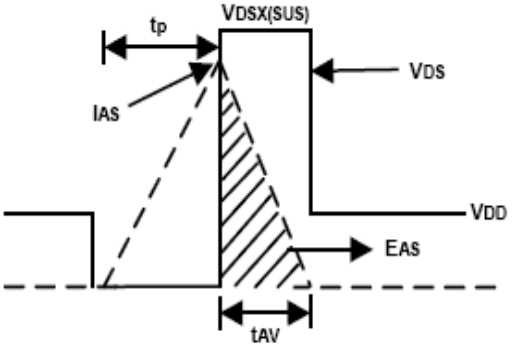


Gate Charge

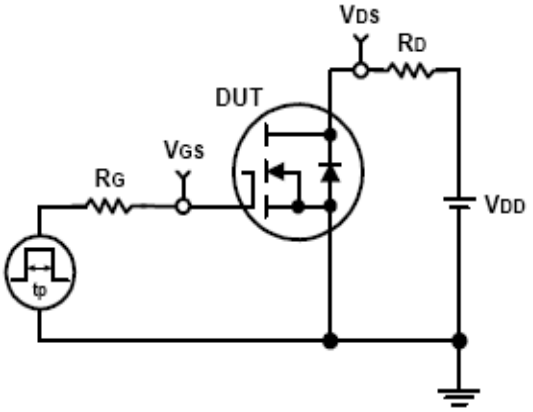


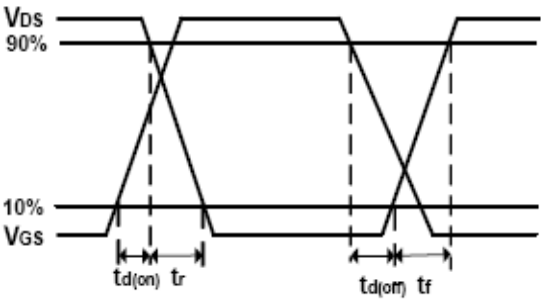
Avalanche Test Circuit and Waveforms





Switching Time Test Circuit and Waveforms



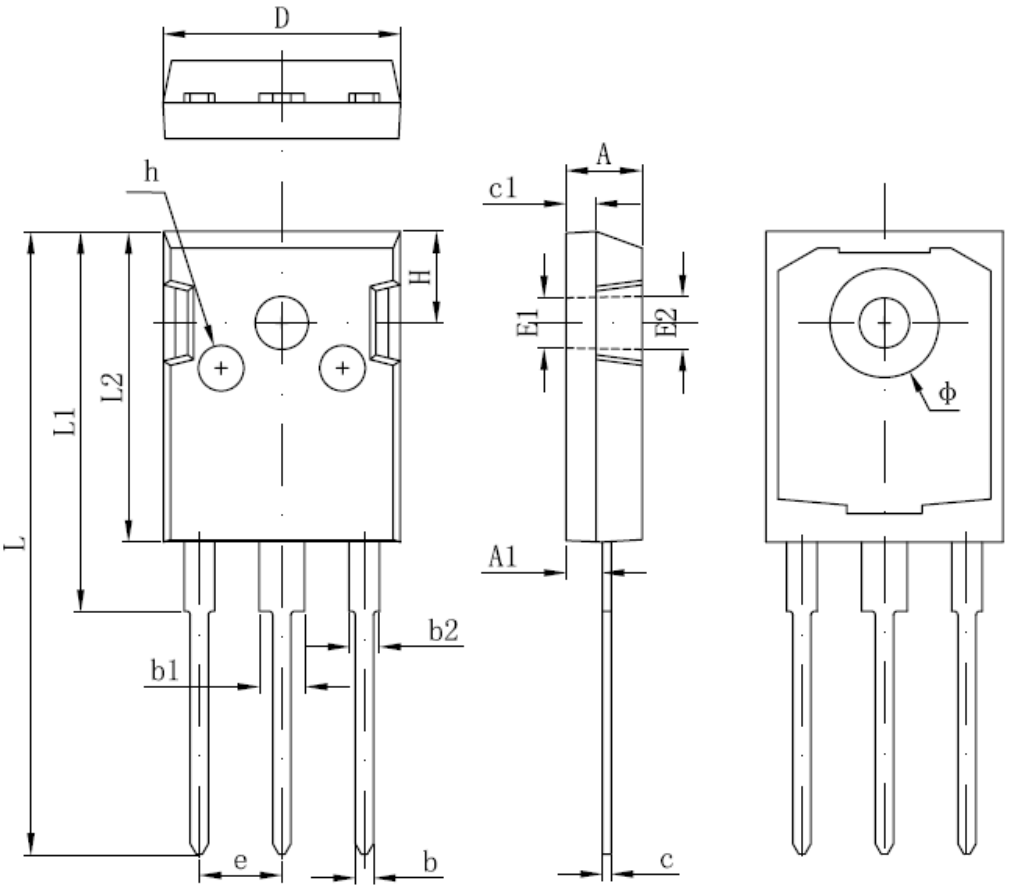


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU5H18Q	RU5H18Q	TO-247	Tube	30	-	-

Package Information

TO-247



SYMBOL	MM		INCH		SYMBOL	MM		INCH	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	4.850	5.150	0,191	0.200	E2	3.600 REF		0.142 REF	
A1	2.200	2.600	0.087	0.102	L	40.900	41.300	1.610	1.626
B	1.000	1.400	0.039	0.055	L1	24.800	25.100	0.976	0.988
b1	2.800	3.200	0.110	0.126	L2	20.300	20.600	0.799	0.811
b2	1.800	2.200	0.071	0.087	Φ	7.100	7.300	0.280	0.287
c	0.500	0.700	0.020	0.028	e	5.450 TYP		0.215 TYP	
c1	1.900	2.100	0.075	0.083	H	5.980 REF.		0.235 REF.	
D	15.450	15.750	0.608	0.620	h	0.000	0.300	0.000	0.012
E1	3.500 REF.		0.138 REF.						

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

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