

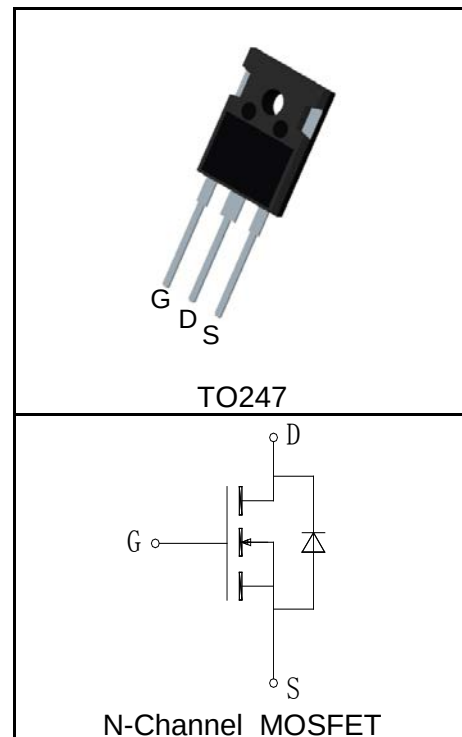
Features

- 75V/400A,
 $R_{DS(ON)} = 1.5m\Omega(Typ.)@V_{GS}=10V$
- Ultra Low On-Resistance
- Exceptional dv/dt capability
- Fast Switching and Fully Avalanche Rated
- 100% avalanche tested
- 175°C Operating Temperature
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- High Efficiency Synchronous Rectification in SMPS
- High Speed Power Switching
- Power Supply

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		75	V
V _{GSS}	Gate-Source Voltage		±25	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Diode Continuous Forward Current	T _C =25°C	400	A
Mounted on Large Heat Sink				
I _{DP} ^①	300μs Pulse Drain Current Tested	T _C =25°C	1480	A
I _D ^②	Continuous Drain Current(V _{GS} =10V)	T _C =25°C	400	A
		T _C =100°C	283	
P _D	Maximum Power Dissipation	T _C =25°C	600	W
		T _C =100°C	300	
R _{θJC}	Thermal Resistance-Junction to Case		0.25	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		50	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^③	Avalanche Energy, Single Pulsed		1225	mJ

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

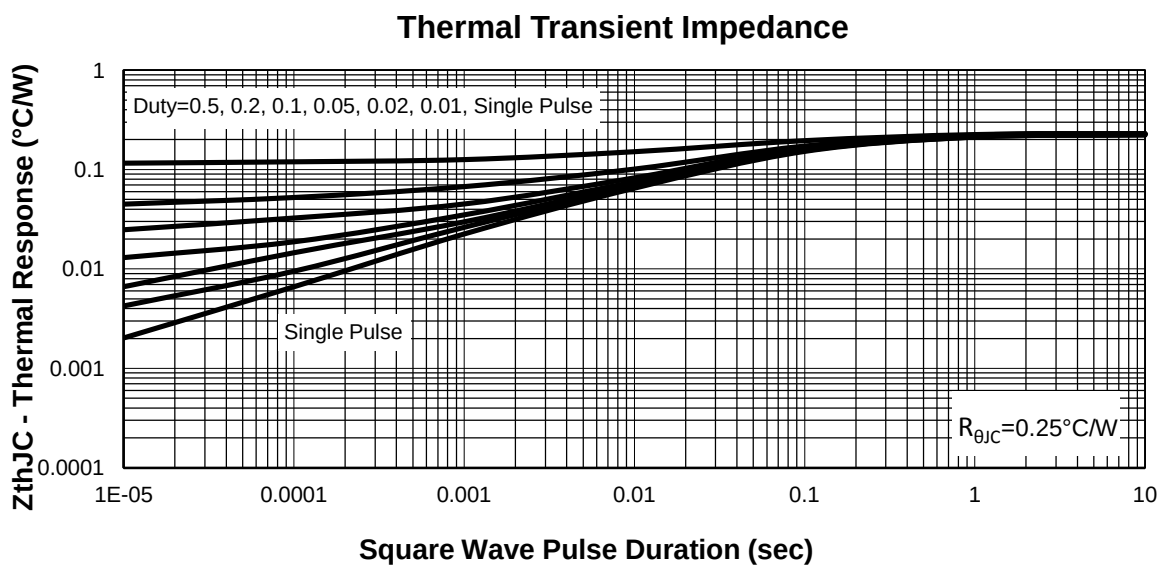
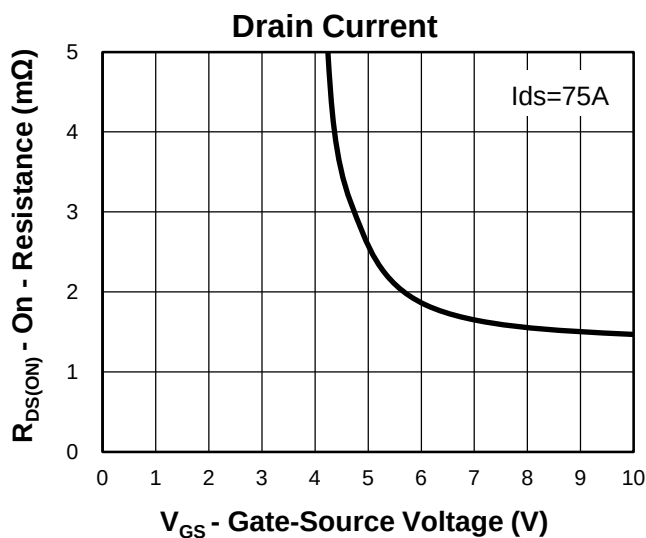
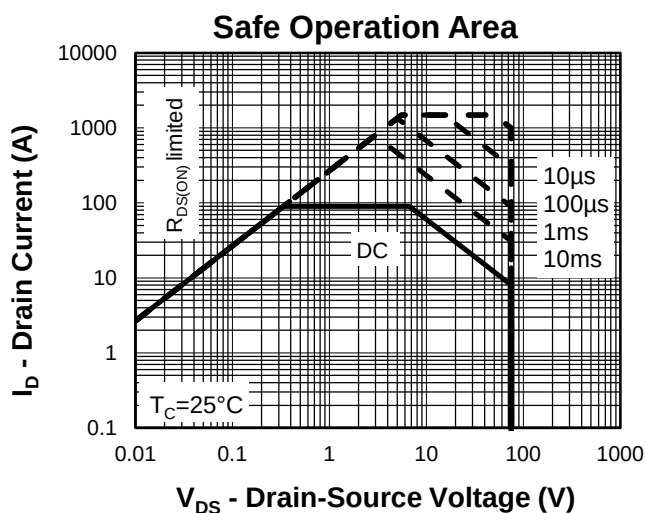
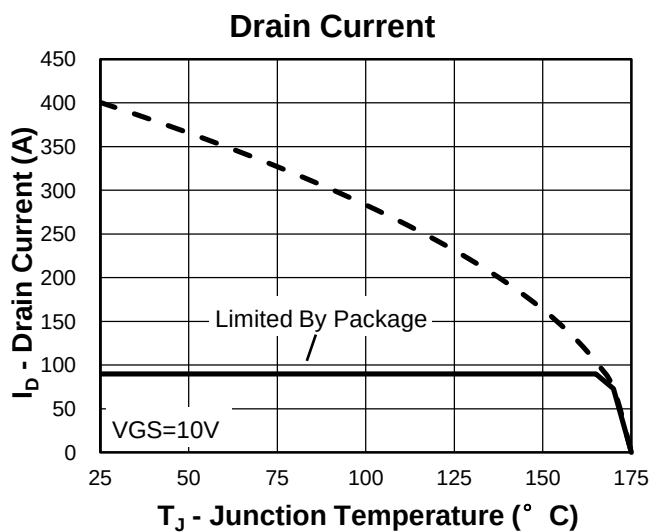
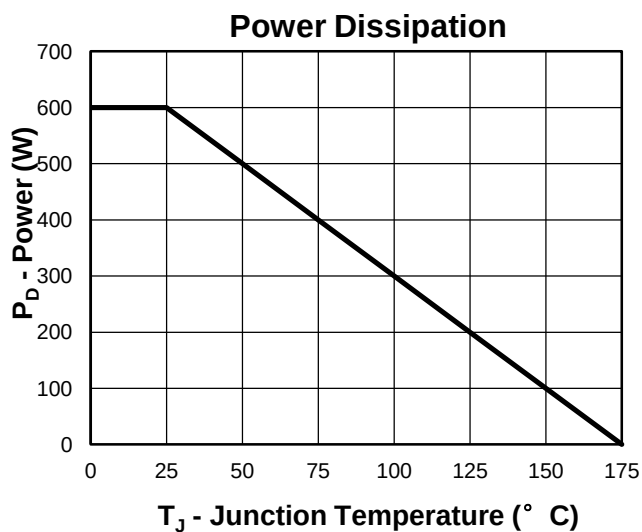
Symbol	Parameter	Test Condition	RU75400Q			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	75			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =75V, V _{GS} =0V			1	μA
			T _J =125°C		30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2	3	4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±25V, V _{DS} =0V			±100	nA
R _{DS(ON)} ^④	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =75A		1.5	2	mΩ
Diode Characteristics						
V _{SD} ^④	Diode Forward Voltage	I _{SD} =75A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =75A, dI _{SD} /dt=100A/μs		150		ns
Q _{rr}	Reverse Recovery Charge			480		nC
Dynamic Characteristics ^⑤						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz		0.9		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =38V, Frequency=1.0MHz		13500		pF
C _{oss}	Output Capacitance			1440		
C _{rss}	Reverse Transfer Capacitance			650		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =0.3Ω, I _{DS} =75A, V _{GEN} =10V, R _G =4.7Ω		38		ns
t _r	Turn-on Rise Time			210		
t _{d(OFF)}	Turn-off Delay Time			165		
t _f	Turn-off Fall Time			280		
Gate Charge Characteristics ^⑤						
Q _g	Total Gate Charge	V _{DS} =60V, V _{GS} =10V, I _{DS} =75A		410		nC
Q _{gs}	Gate-Source Charge			80		
Q _{gd}	Gate-Drain Charge			110		

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 90A.
 - ③ Limited by T_{Jmax} , $I_{AS}=70A$, $V_{DD}=48V$, $R_G=50\Omega$, 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.

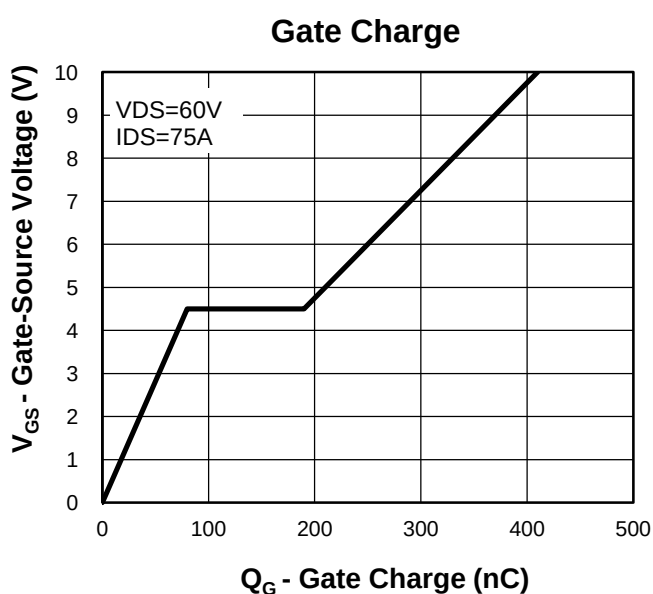
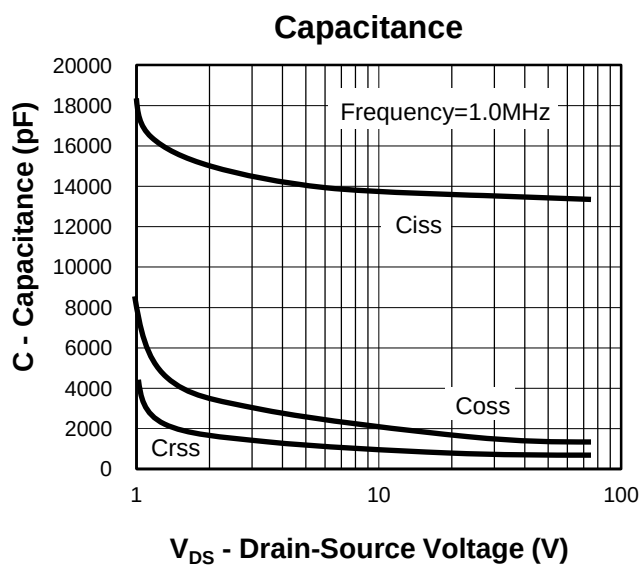
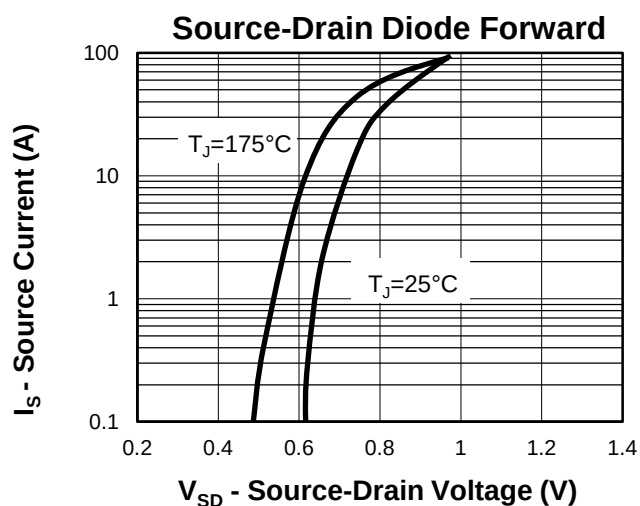
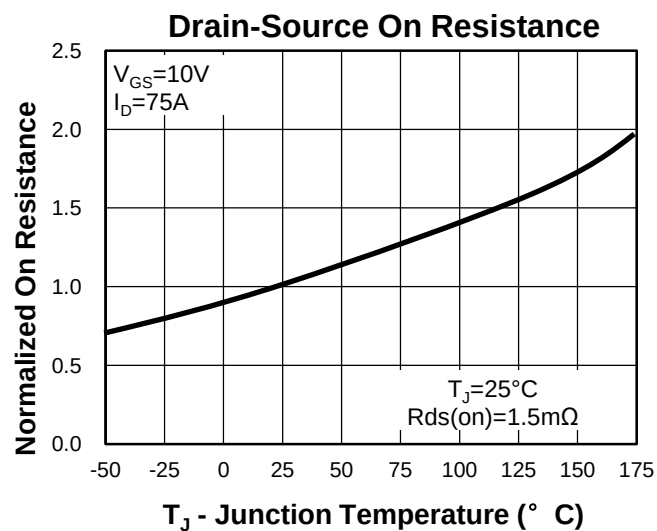
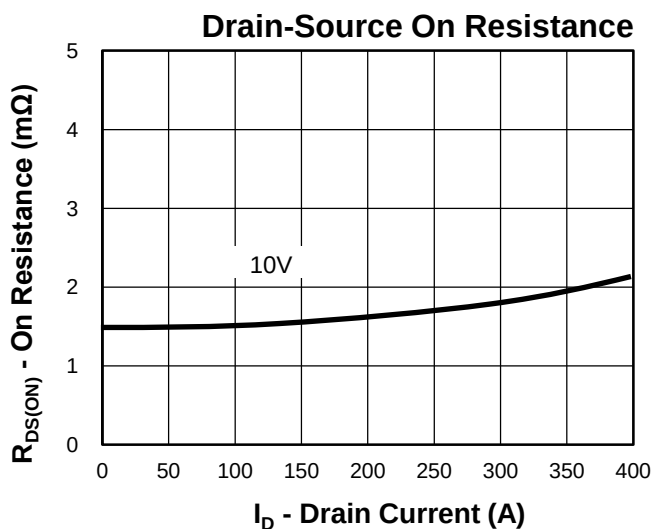
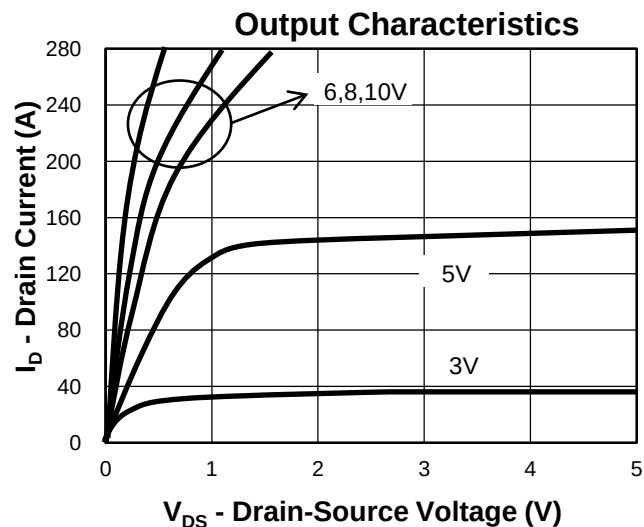
Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU75400Q	RU75400Q	TO247	Tube	30	-	-

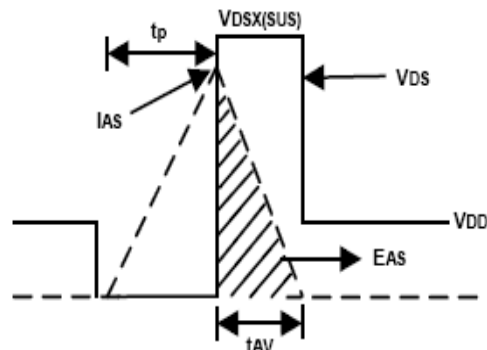
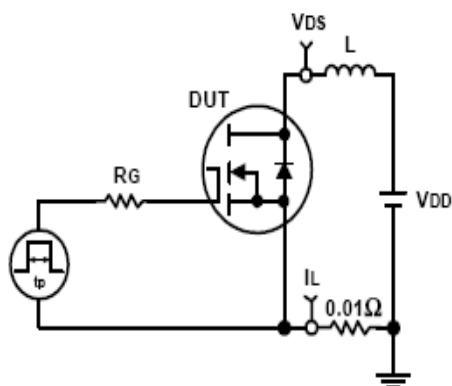
Typical Characteristics



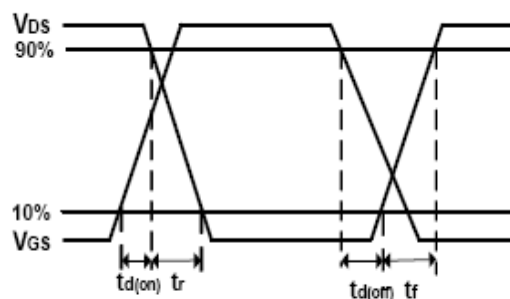
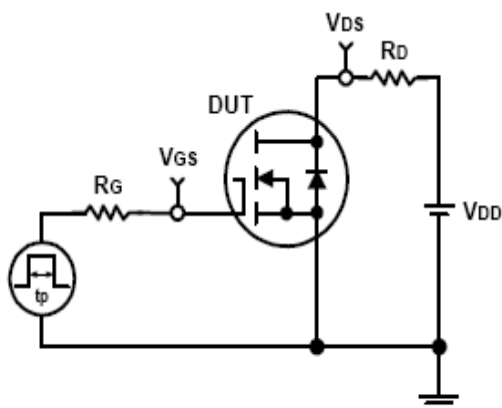
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Avalanche Test Circuit and Waveforms

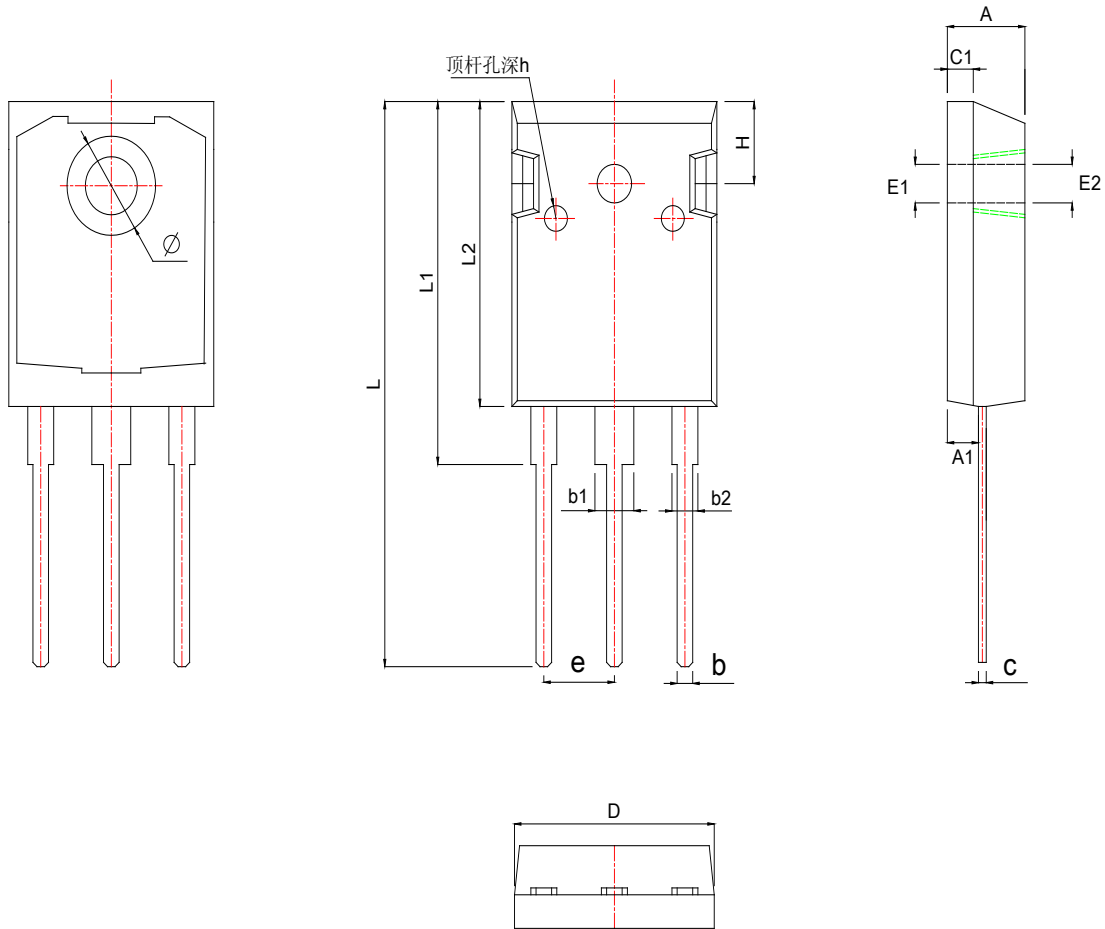


Switching Time Test Circuit and Waveforms



Package Information

TO247



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.850	5.000	5.150	0.191	0.197	0.203
A1	2.200	2.400	2.600	0.087	0.094	0.102
b	1.000	1.200	1.400	0.039	0.047	0.055
b1	2.800	3.000	3.200	0.110	0.118	0.126
b2	1.800	2.000	2.200	0.071	0.079	0.087
c	0.500	0.600	0.700	0.020	0.024	0.028
c1	1.900	2.000	2.100	0.075	0.079	0.083
D	15.450	15.600	15.750	0.608	0.614	0.620
E1	3.500REF			0.138REF		
E2	3.600REF			0.142REF		
L	40.900	41.100	41.300	1.610	1.618	1.626
L1	24.800	24.950	25.100	0.976	0.982	0.988
L2	20.300	20.450	20.600	0.799	0.805	0.811
Φ	7.10	7.20	7.30	0.280	0.283	0.287
e	5.450TYP			0.215TYP		
H	5.980REF			0.235REF		
h	0.000	0.150	0.300	0.000	0.006	0.012

Customer Service

Worldwide Sales and Service:

Sales@ruichips.com

Technical Support:

Technical@ruichips.com

Investor Relations Contacts:

Investor@ruichips.com

Marcom Contact:

Marcom@ruichips.com

Editorial Contact:

Editorial@ruichips.comm

HR Contact:

HR@ruichips.com

Legal Contact:

Legal@ruichips.com

Shen Zhen RUICHIPS Semiconductor CO., LTD

Room 501, the 5floor An Tong Industrial Building,
NO.207 Mei Hua Road Fu Tian Area Shen Zhen City, CHINA

TEL: (86-755) 8311-5334

FAX: (86-755) 8311-4278

E-mail: Sales-SZ@ruichips.com