

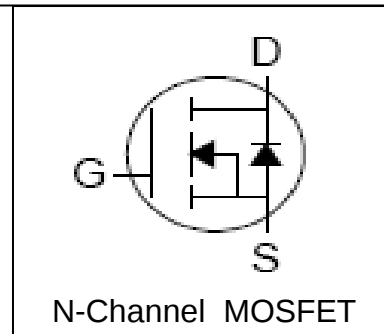
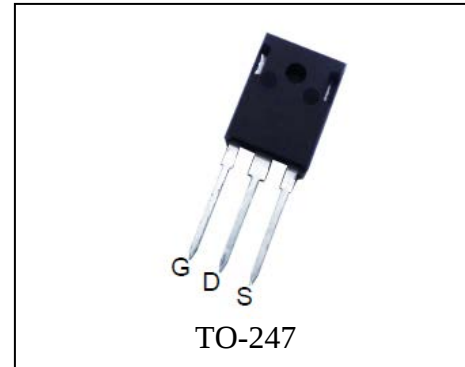
Features

- 40V/200A
 $R_{DS(ON)}=2.8m\Omega(Typ.) @ V_{GS}=10V$
- Avalanche Rated
- Reliable and Rugged
- Lead Free and Green Devices Available

Applications

- Automotive applications and a wide variety of other applications
- High Efficiency Synchronous in SMPS
- High Speed Power Switching

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _A =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		40	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	200 ^①	A
Mounted on Large Heat Sink				
I _{DP}	300μs Pulsed Drain Current Tested	T _C =25°C	800 ^②	A
I _D	Continue Drain Current	T _C =25°C	200 ^①	
		T _C =100°C	140 ^①	
P _D	Maximum Power Dissipation	T _C =25°C	312	W
		T _C =100°C	156	
R _{θJC}	Thermal Resistance -Junction to Case		0.48	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^③	Avalanche Energy ,Single Pulsed		1400	mJ

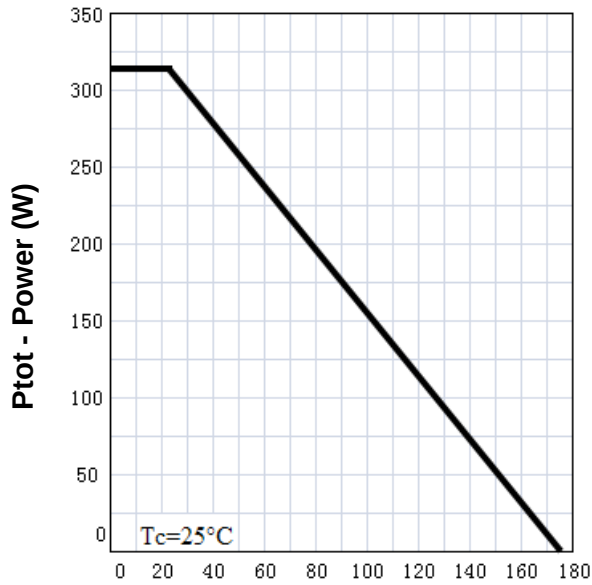
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

	Parameter	Test Condition	RU4099Q			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 40V, 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} =±25V, V _{DS} =0V			±100	nA
R _{DS(ON)} ^④	Drain-Source On-state Resistance	V _{GS} = 10V, I _{DS} =40A		2.8	3.5	mΩ
Diode Characteristics						
V _{SD} ^④	Diode Forward Voltage	I _{SD} =40A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =40A, dI _{SD} /dt=100A/μs		74		ns
q _{rr}	Reverse Recovery Charge			148		nC
Dynamic Characteristics ^⑤						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz		1.4		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} = 30V, Frequency=1.0MHz		5750		pF
C _{oss}	Output Capacitance			1400		
C _{rss}	Reverse Transfer Capacitance			480		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =35V, R _L =35Ω, I _{DS} = 1A, V _{GEN} = 10V, R _G =6Ω		21		ns
t _r	Turn-on Rise Time			37		
t _{d(OFF)}	Turn-off Delay Time			75		
t _f	Turn-off Fall Time			115		
Gate Charge Characteristics ^⑤						
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} = 10V, I _{DS} =40A		154		nC
Q _{gs}	Gate-Source Charge			44		
Q _{gd}	Gate-Drain Charge			47		

- Notes:
- ① Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 90A.
 - ② Pulse width limited by safe operating area.
 - ③ Limited by T_{Jmax} , $I_{AS}=30A, V_{DD}=48V, R_G=47\Omega$, 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.

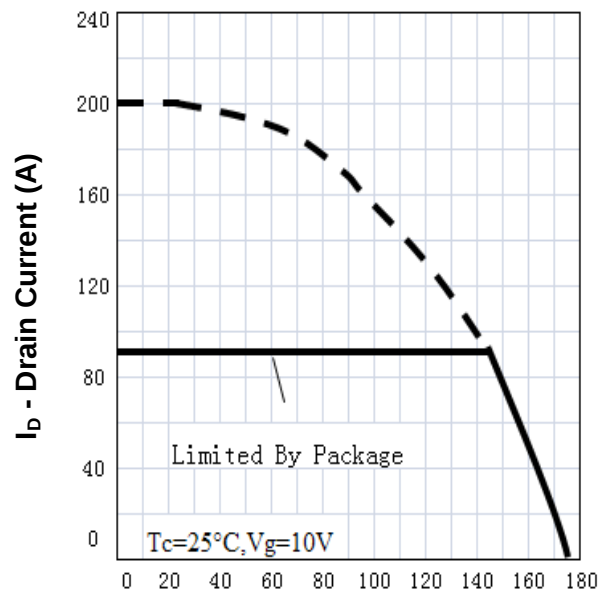
Typical Characteristics

Power Dissipation



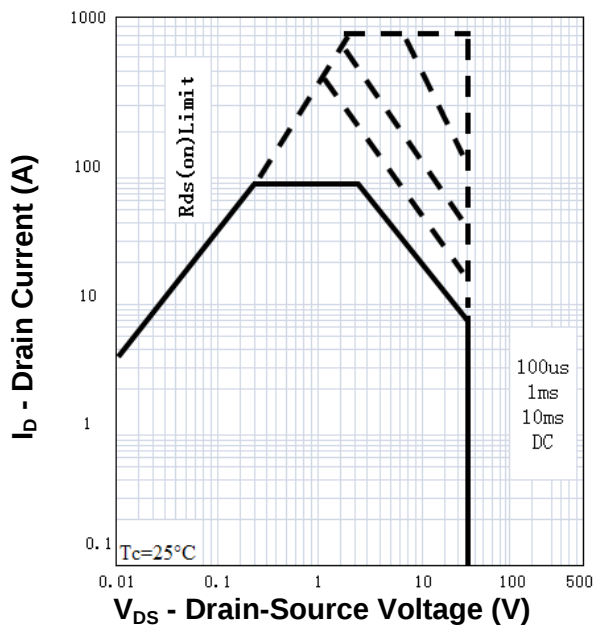
T_j - Junction Temperature ($^{\circ}\text{C}$)

Drain Current

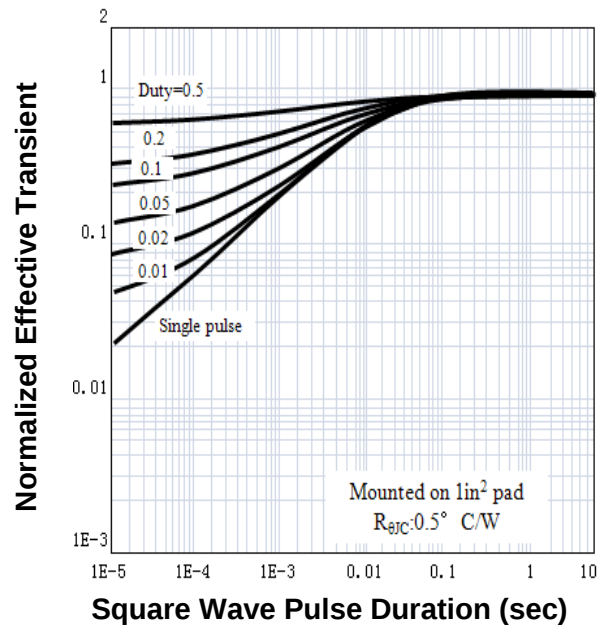


T_j - Junction Temperature ($^{\circ}\text{C}$)

Safe Operation Area

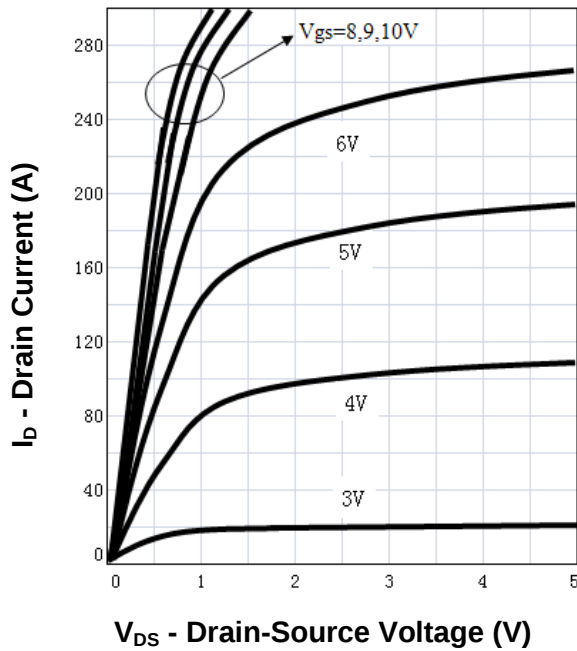


Thermal Transient Impedance

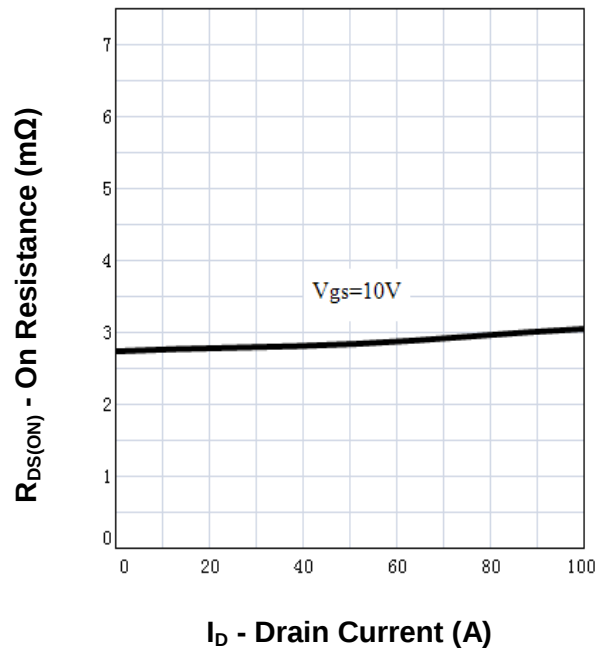


Typical Characteristics

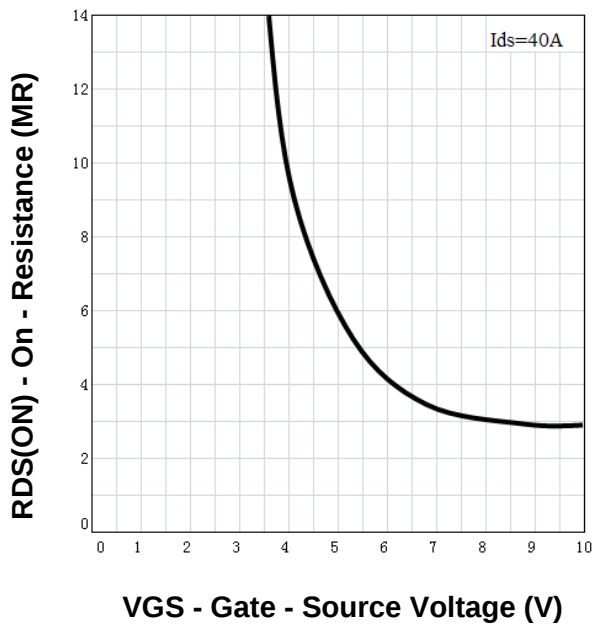
Output Characteristics



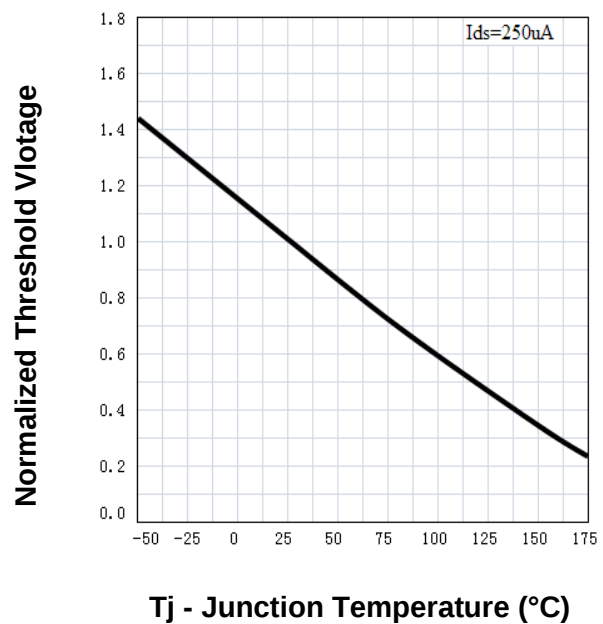
Drain-Source On Resistance



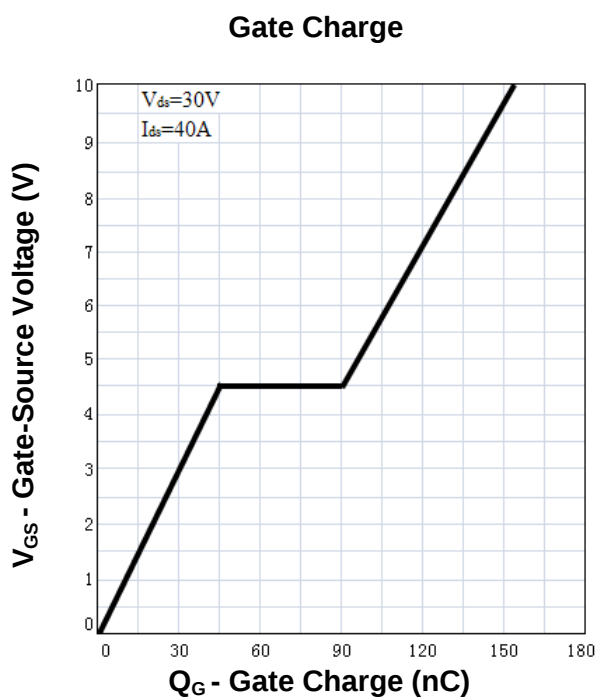
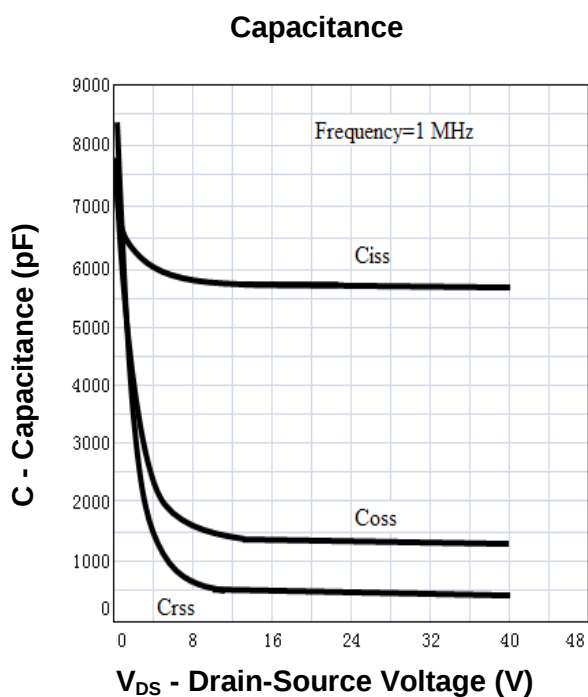
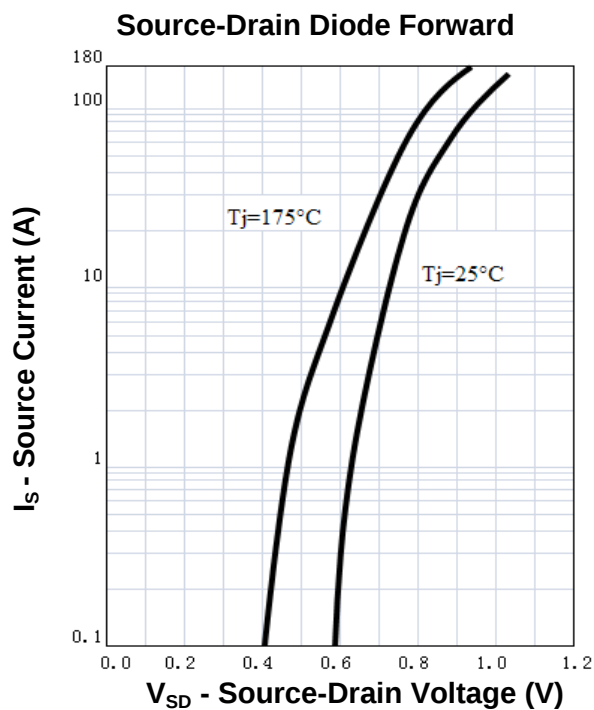
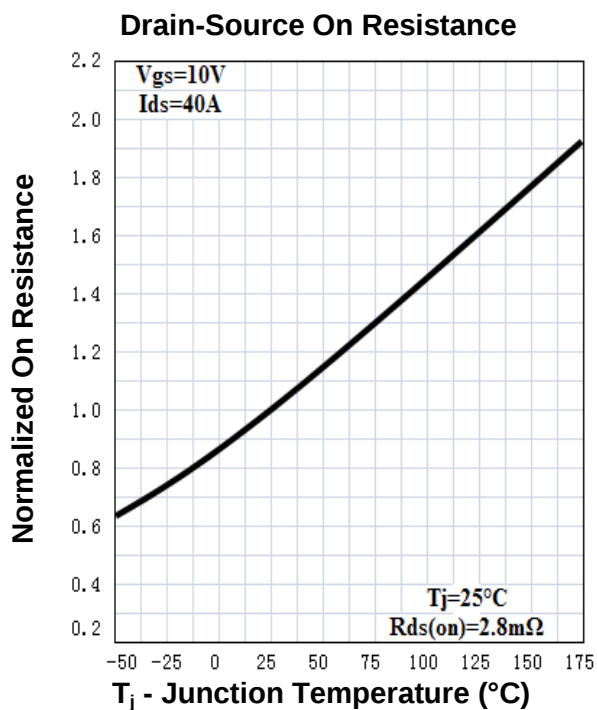
Drain-Source On Resistance



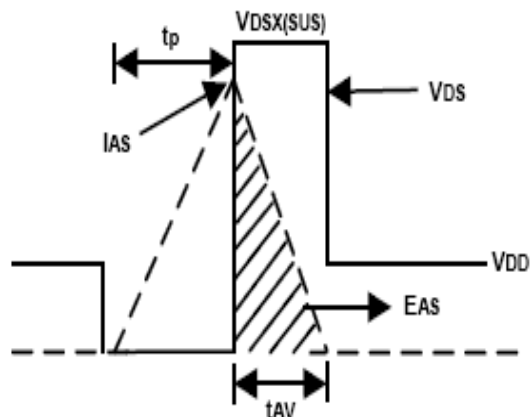
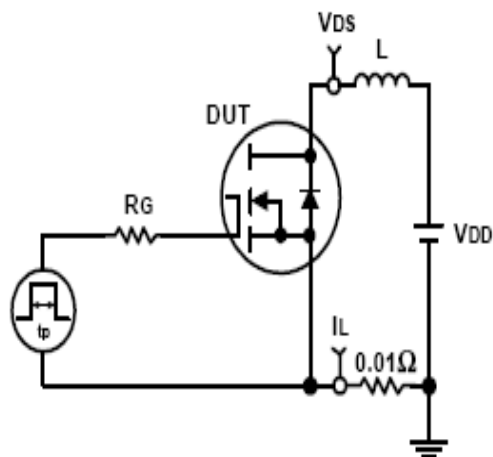
Gate Threshold Voltage



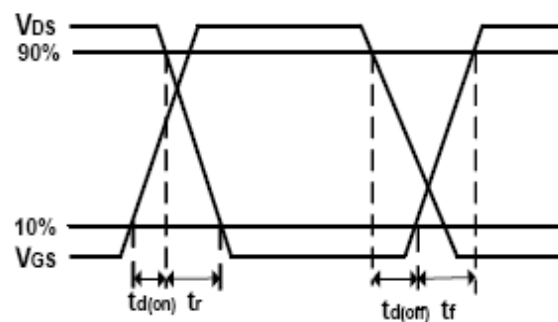
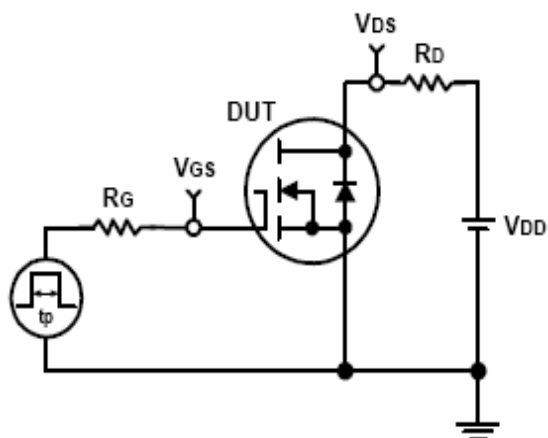
Typical Characteristics



Avalanche Test Circuit and Waveforms



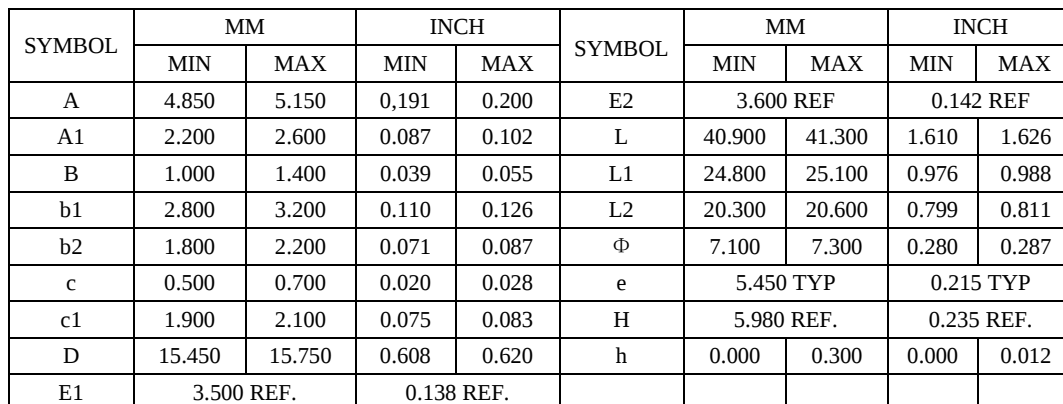
Switching Time Test Circuit and Waveforms



Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU4099Q	RU4099Q	TO-247	Tube	30	-	-

TO-247



www.ruichips.com

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.com

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