

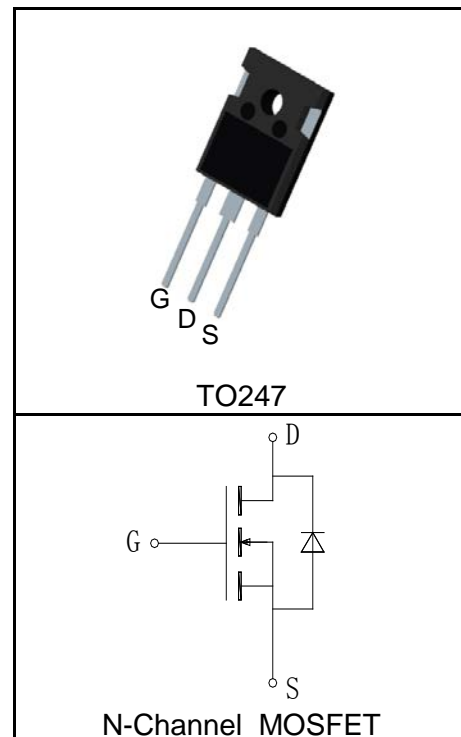
### Features

- 55V/200A,  
 $R_{DS(ON)} = 3.3m\Omega(Typ.)@V_{GS}=10V$
- Ultra Low On-Resistance
- 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 <sub>C</sub> =25°C Unless Otherwise Noted)				
V <sub>DSS</sub>	Drain-Source Voltage		55	V
V <sub>GSS</sub>	Gate-Source Voltage		±25	
T <sub>J</sub>	Maximum Junction Temperature		175	°C
T <sub>STG</sub>	Storage Temperature Range		-55 to 175	°C
I <sub>S</sub>	Diode Continuous Forward Current	T <sub>C</sub> =25°C	200	A
Mounted on Large Heat Sink				
I <sub>DP</sub> <sup>①</sup>	300μs Pulse Drain Current Tested	T <sub>C</sub> =25°C	800	A
I <sub>D</sub> <sup>②</sup>	Continuous Drain Current(V <sub>GS</sub> =10V)	T <sub>C</sub> =25°C	200	A
		T <sub>C</sub> =100°C	142	
P <sub>D</sub>	Maximum Power Dissipation	T <sub>C</sub> =25°C	326	W
		T <sub>C</sub> =100°C	163	
R <sub>θJC</sub>	Thermal Resistance-Junction to Case		0.46	°C/W
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient		50	°C/W
Drain-Source Avalanche Ratings				
E <sub>AS</sub> <sup>③</sup>	Avalanche Energy, Single Pulsed		625	mJ

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

Symbol	Parameter	Test Condition	RU55200Q			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	55	65		V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =55V, V <sub>GS</sub> =0V			1	μA
		T <sub>J</sub> =125°C			30	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	2	3	4	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±25V, V <sub>DS</sub> =0V			±100	nA
R <sub>DS(ON)</sub> ④	Drain-Source On-state Resistance	V <sub>GS</sub> =10V, I <sub>DS</sub> =40A		3.3	4	mΩ
Diode Characteristics						
V <sub>SD</sub> ④	Diode Forward Voltage	I <sub>SD</sub> =40A, V <sub>GS</sub> =0V			1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =40A, dI <sub>SD</sub> /dt=100A/μs		70		ns
Q <sub>rr</sub>	Reverse Recovery Charge			135		nC
Dynamic Characteristics⑤						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V,V <sub>DS</sub> =0V,F=1MHz		2		Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =28V, Frequency=1.0MHz		6700		pF
C <sub>oss</sub>	Output Capacitance			1100		
C <sub>rss</sub>	Reverse Transfer Capacitance			480		
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =28V, I <sub>DS</sub> =40A, V <sub>GEN</sub> =10V,R <sub>G</sub> =4.5Ω		40		ns
t <sub>r</sub>	Turn-on Rise Time			23		
t <sub>d(OFF)</sub>	Turn-off Delay Time			120		
t <sub>f</sub>	Turn-off Fall Time			70		
Gate Charge Characteristics⑤						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =44V, V <sub>GS</sub> =10V, I <sub>DS</sub> =40A		160		nC
Q <sub>gs</sub>	Gate-Source Charge			50		
Q <sub>gd</sub>	Gate-Drain Charge			47		

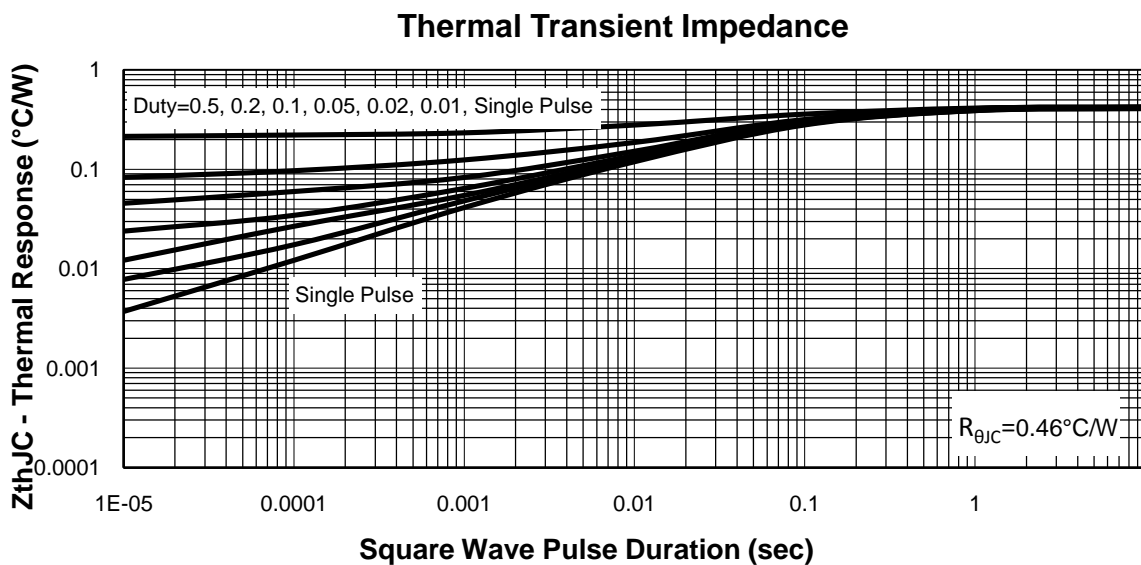
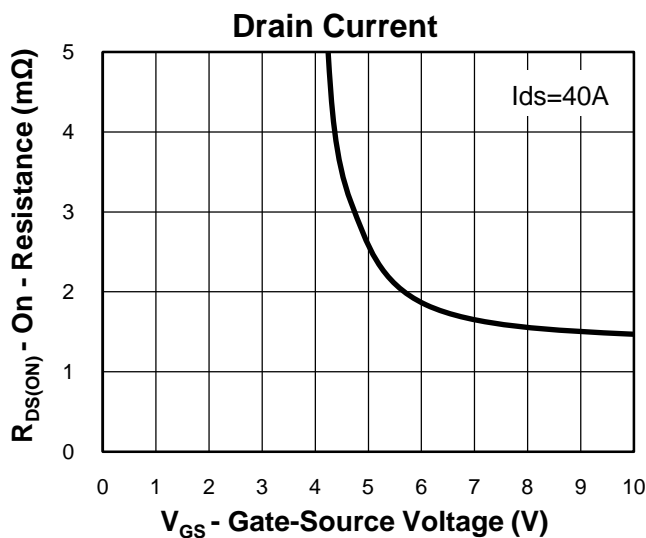
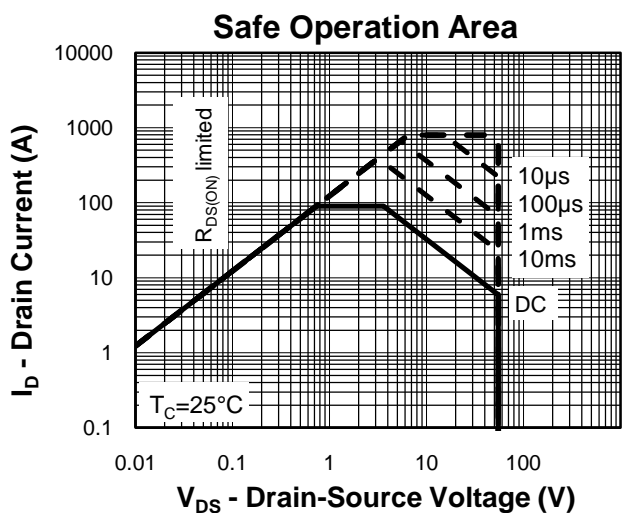
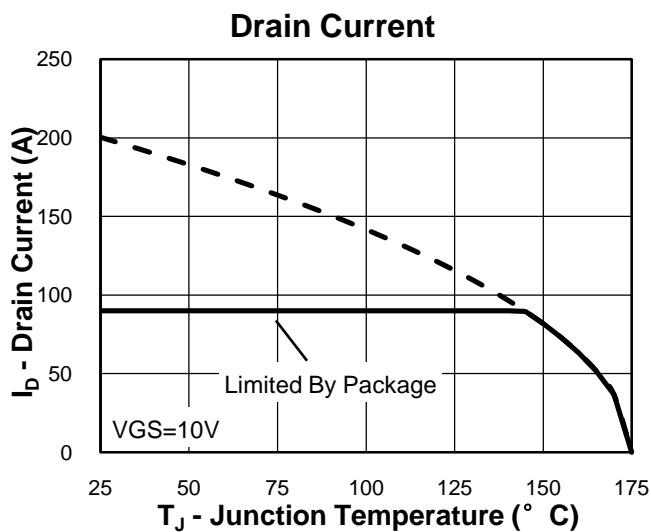
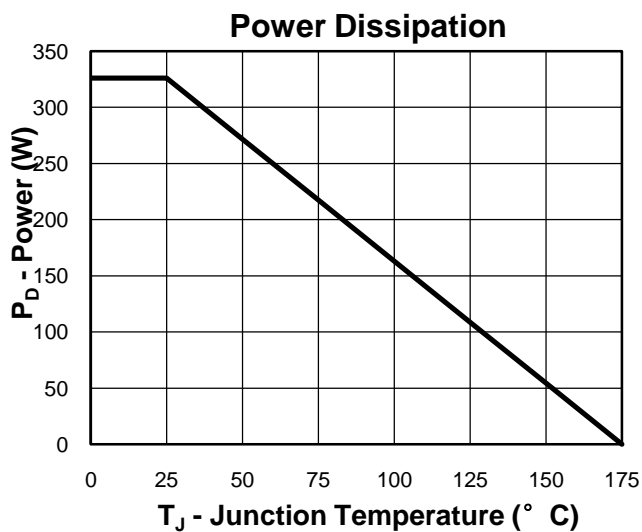
**Notes:**

- 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  $T_{Jmax}$ ,  $I_{AS}=50A$ ,  $V_{DD}=48V$ ,  $R_G=50\Omega$ , 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.

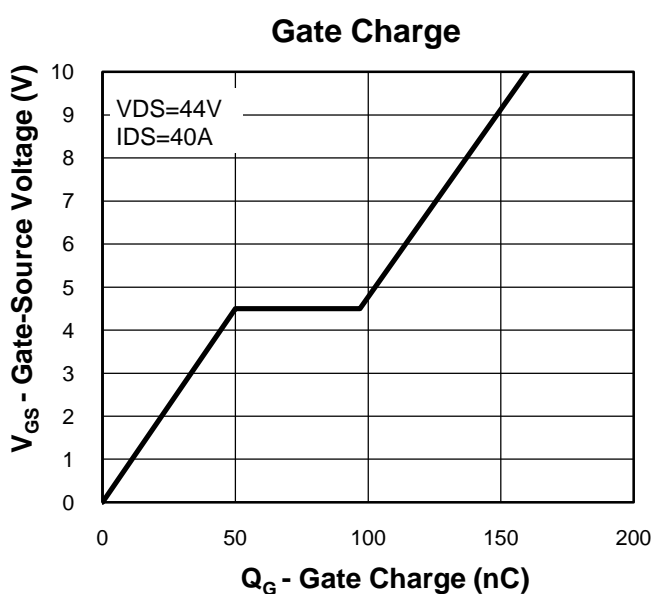
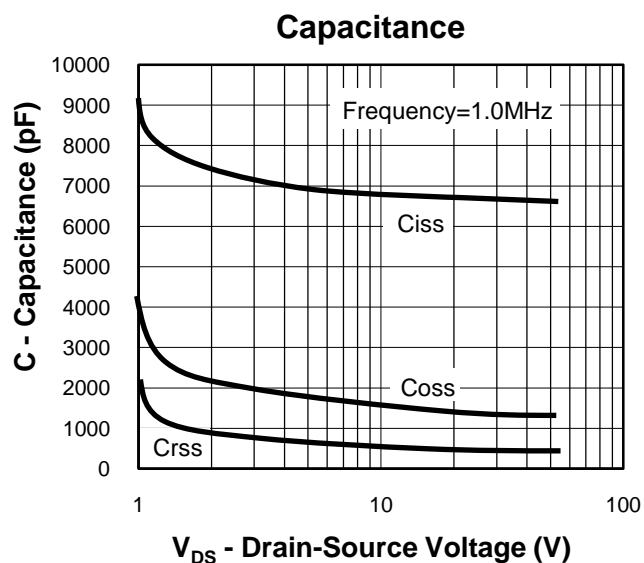
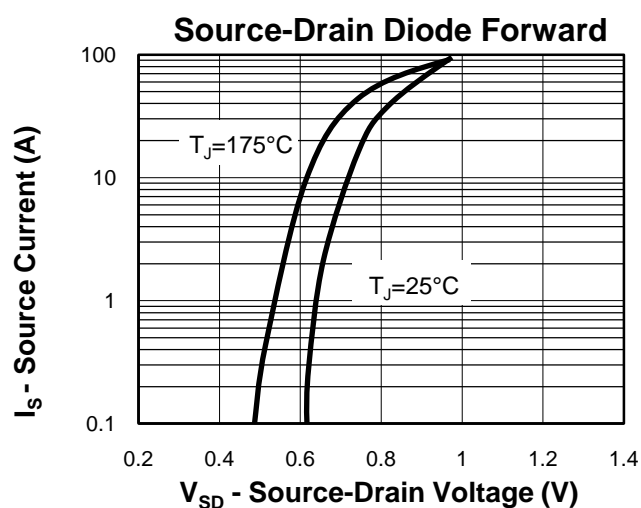
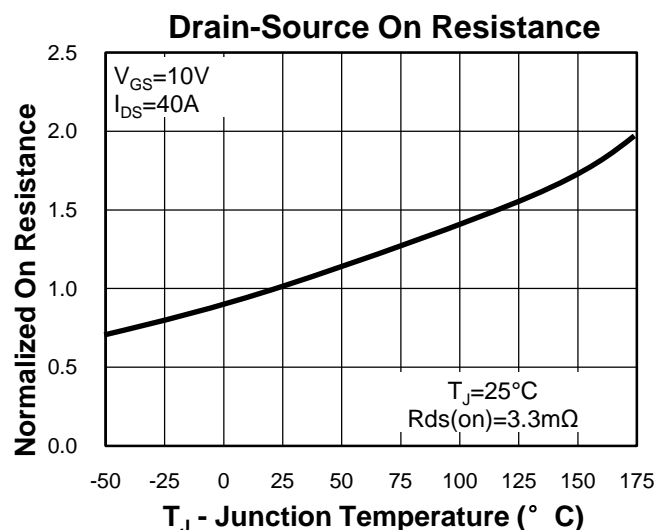
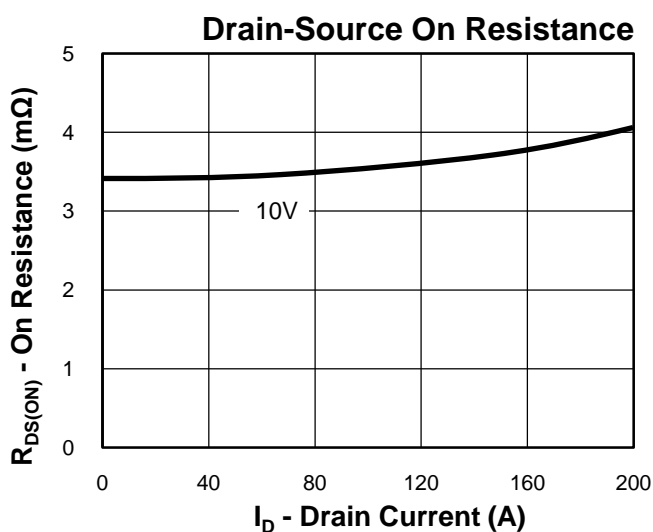
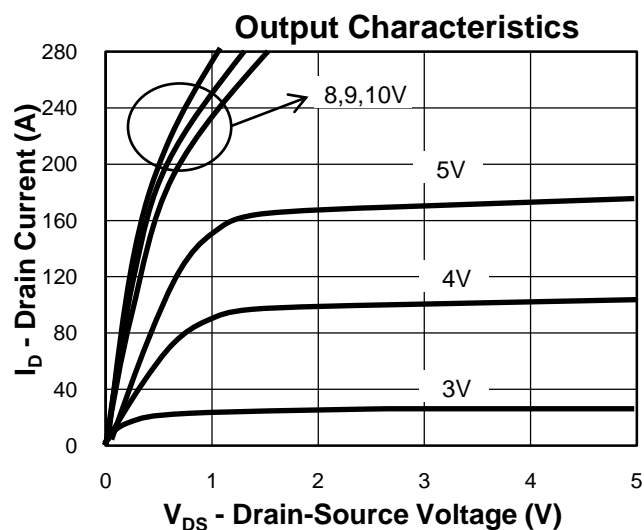
**Ordering and Marking Information**

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU55200Q	RU55200Q	TO247	Tube	30	-	-

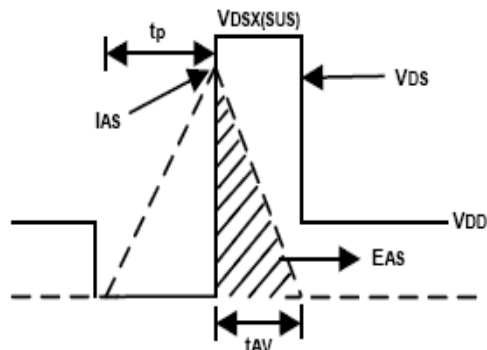
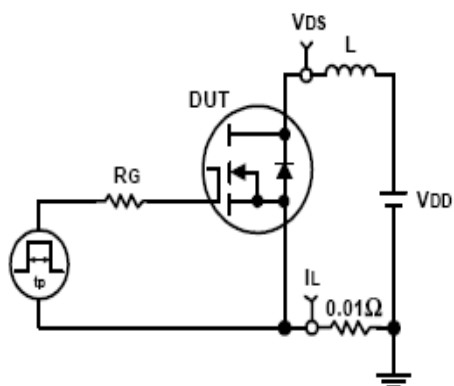
## Typical Characteristics



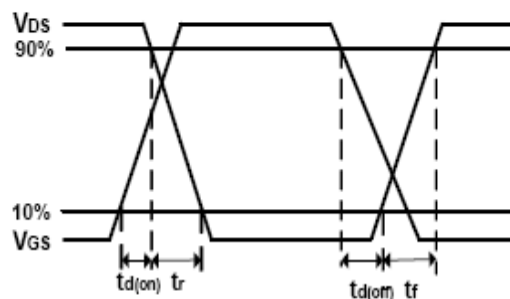
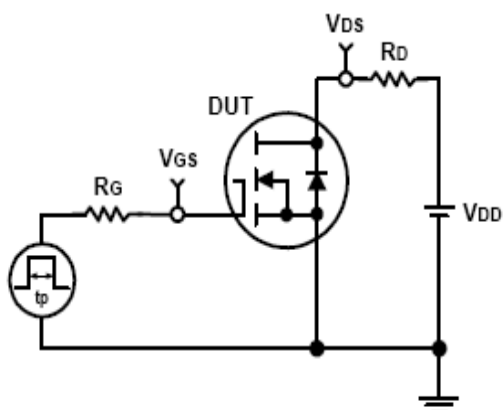
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## Avalanche Test Circuit and Waveforms

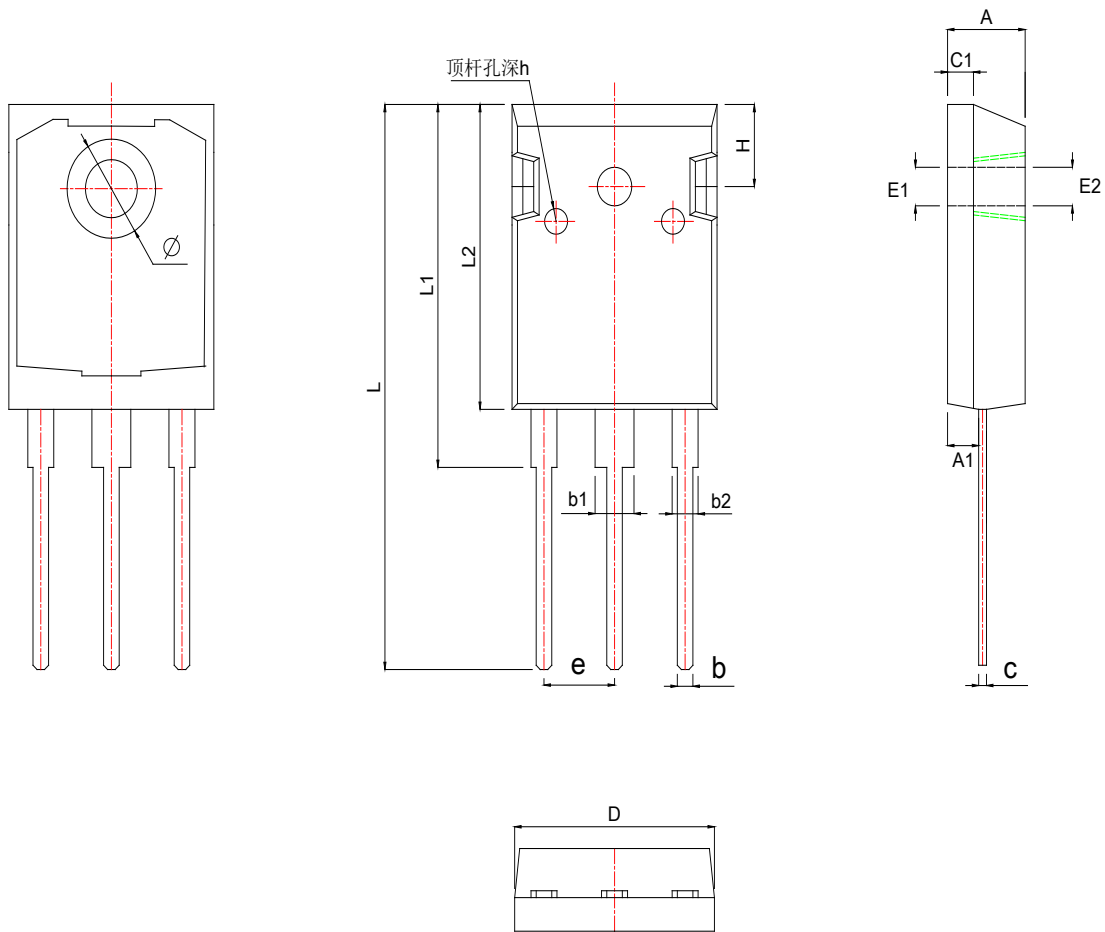


## Switching Time Test Circuit and Waveforms



**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
$\Phi$	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

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