

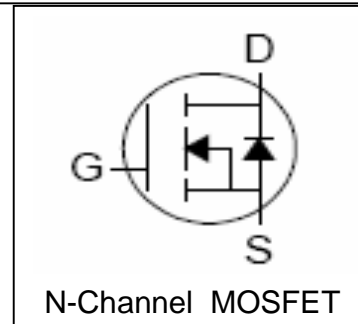
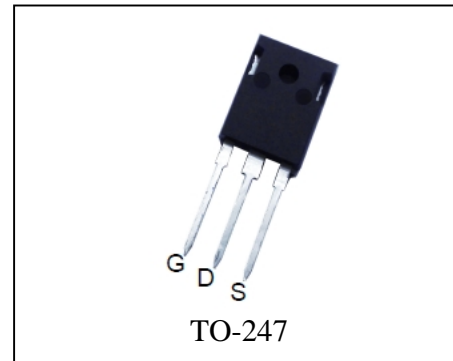
## Features

- 200V/60A,  
 $R_{DS(ON)} = 34m\Omega$  (Type) @  $V_{GS} = 10V$
- Low Gate Charge
- Fast Switching
- 100% avalanche tested
- 175°C Operating Temperature
- Lead Free, RoHS compliant

## Applications

- Switching Application

## Pin Description



## Absolute Maximum Ratings

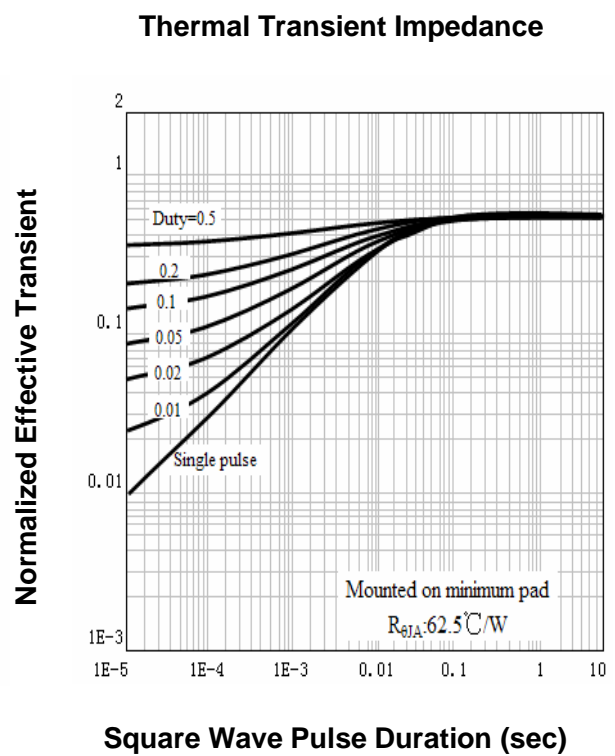
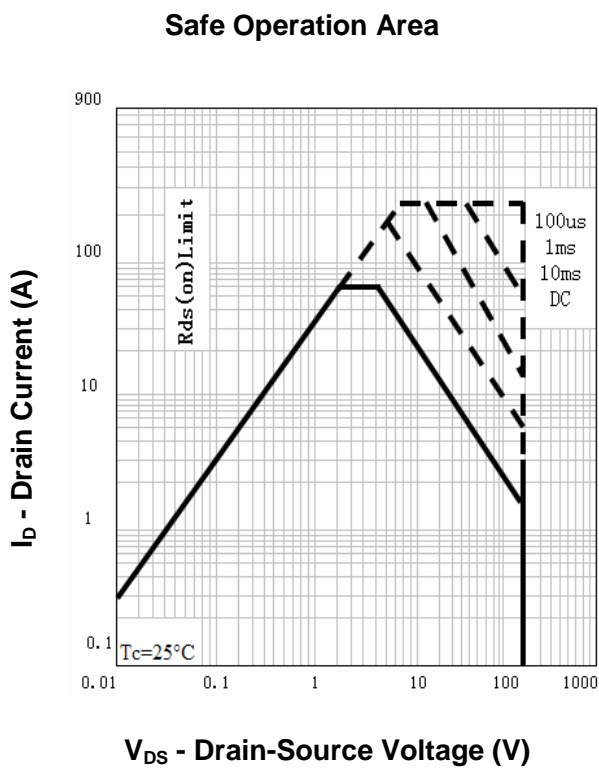
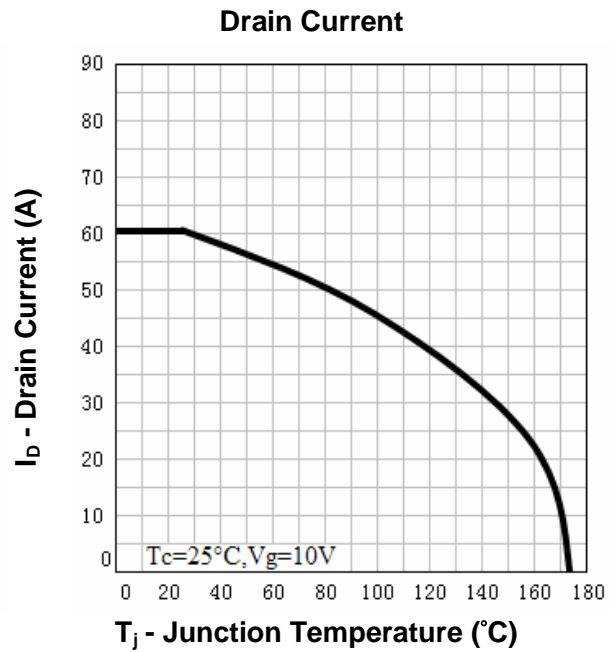
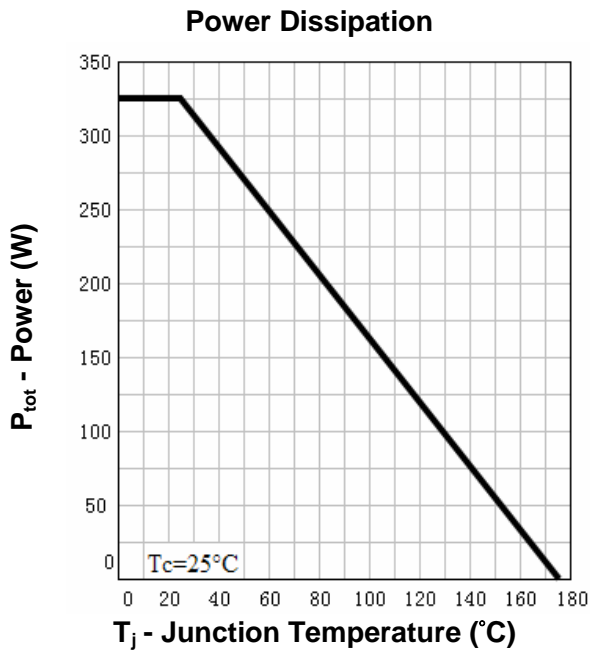
Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_A = 25^\circ C$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	200	V
$V_{GSS}$	Gate-Source Voltage	$\pm 25$	
$T_J$	Maximum Junction Temperature	175	$^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ C$
$I_S$	Diode Continuous Forward Current	$T_C = 25^\circ C$ 60	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}$	300 $\mu s$ Pulse Drain Current Tested	$T_C = 25^\circ C$ 230 <sup>①</sup>	A
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$ 60 <sup>②</sup>	A
		$T_C = 100^\circ C$ 45 <sup>②</sup>	
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$ 326	W
		$T_C = 100^\circ C$ 163	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.46	$^\circ C/W$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}$ <sup>③</sup>	Avalanche Energy, Single Pulsed	157	mJ

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

Symbol	Parameter	Test Condition	RU2H50Q			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	200			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=200V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			1	$\mu A$
					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	$V_{GS}=\pm 25V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(4)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=28A$		34	40	m $\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=28A, V_{GS}=0V$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=28A, di_{SD}/dt=100A/\mu s$		212		ns
$Q_{rr}$	Reverse Recovery Charge			980		nC
<b>Dynamic Characteristics</b> <sup>(5)</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		3.8		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=50V,$ Frequency=1.0MHz		4550		pF
$C_{oss}$	Output Capacitance			620		
$C_{rss}$	Reverse Transfer Capacitance			155		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=100V, R_L=35\Omega,$ $I_{DS}=28A, V_{GEN}=10V,$ $R_G=6\Omega$		18		ns
$t_r$	Turn-on Rise Time			70		
$t_{d(OFF)}$	Turn-off Delay Time			56		
$t_f$	Turn-off Fall Time			45		
<b>Gate Charge Characteristics</b> <sup>(5)</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=160V, V_{GS}=10V,$ $I_{DS}=28A$		160	208	nC
$Q_{gs}$	Gate-Source Charge			29		
$Q_{gd}$	Gate-Drain Charge			70		

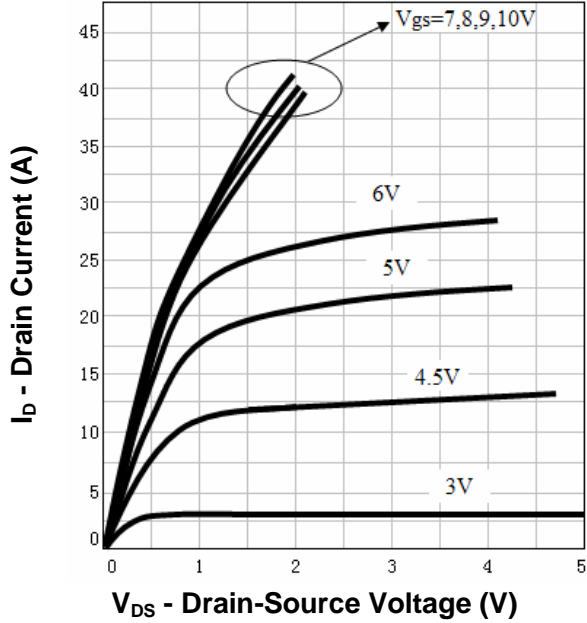
- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature. Current limited by bond wire.
  - ③ Limited by  $T_{Jmax}, I_{AS}=21A, V_{DD}=60V, R_G=47\Omega$ , Starting  $T_J=25^\circ\text{C}$ .
  - ④ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑤ Guaranteed by design, not subject to production testing.

**Typical Characteristics**

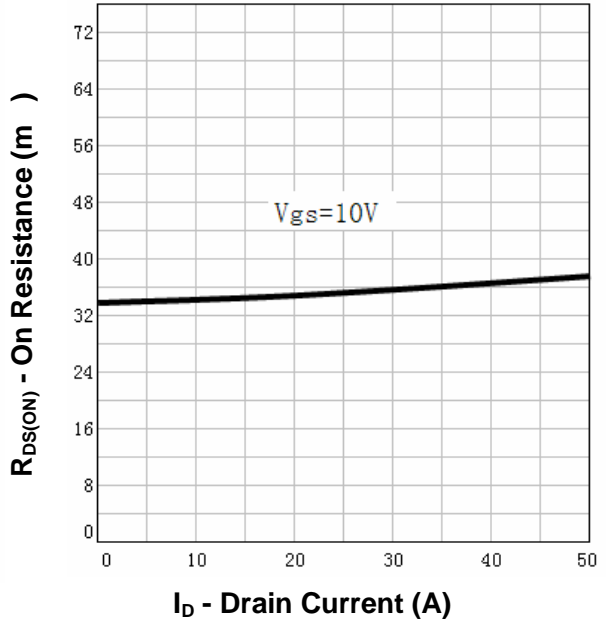


**Typical Characteristics**

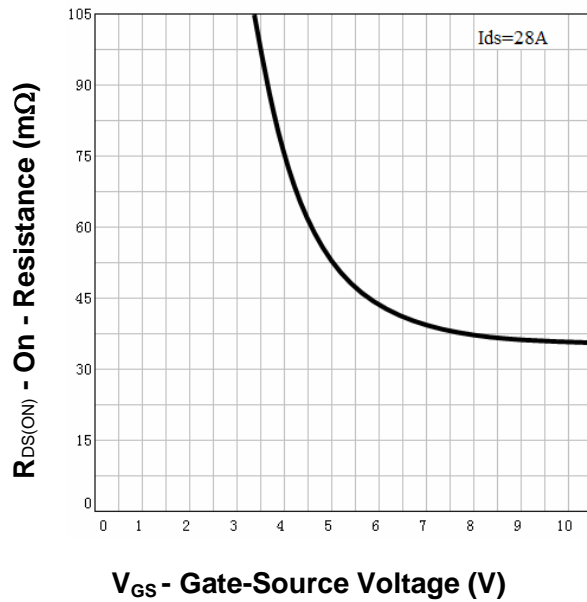
**Output Characteristics**



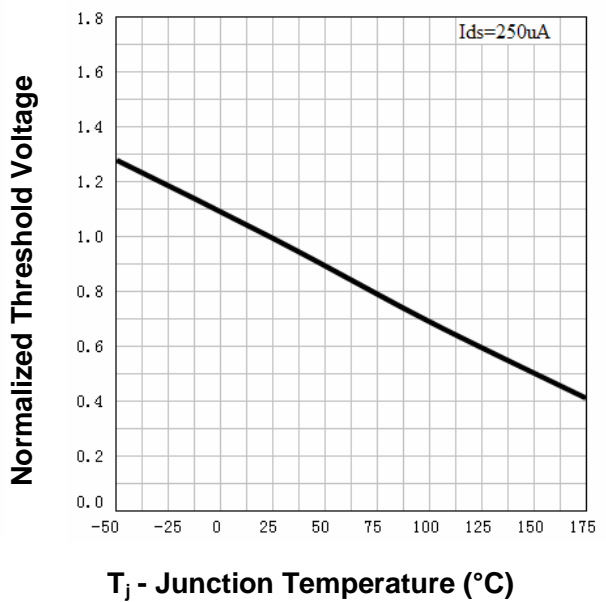
**Drain-Source On Resistance**



**Drain-Source On Resistance**

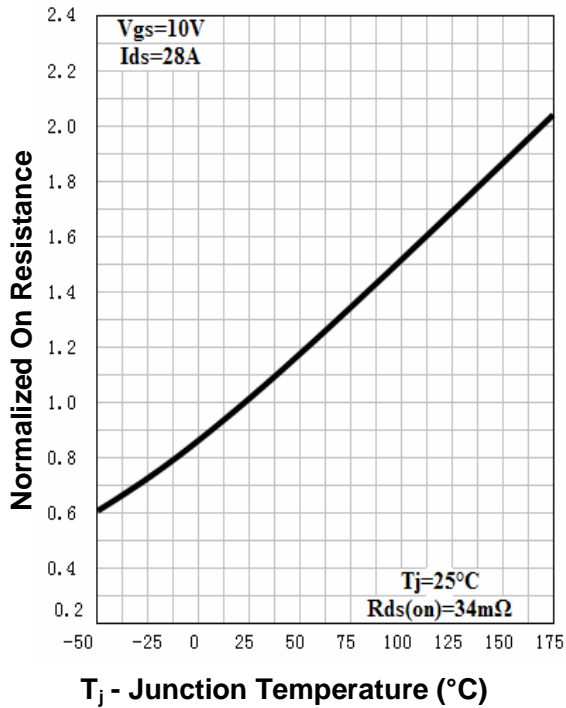


**Gate Threshold Voltage**

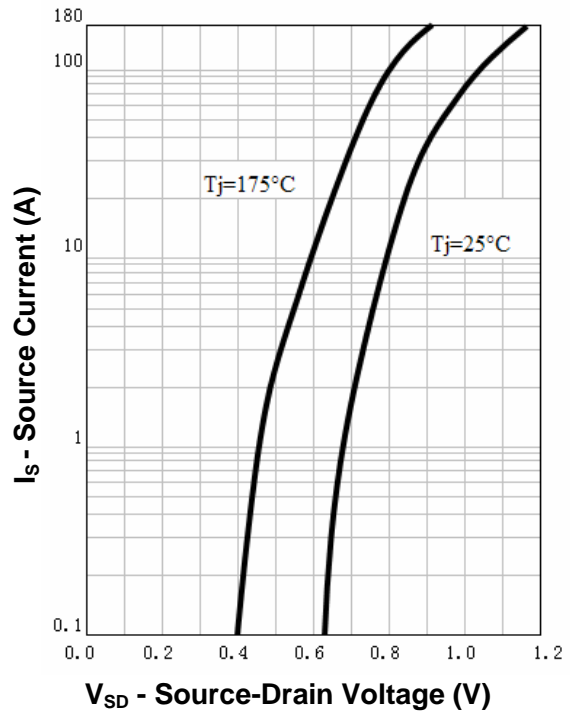


**Typical Characteristics**

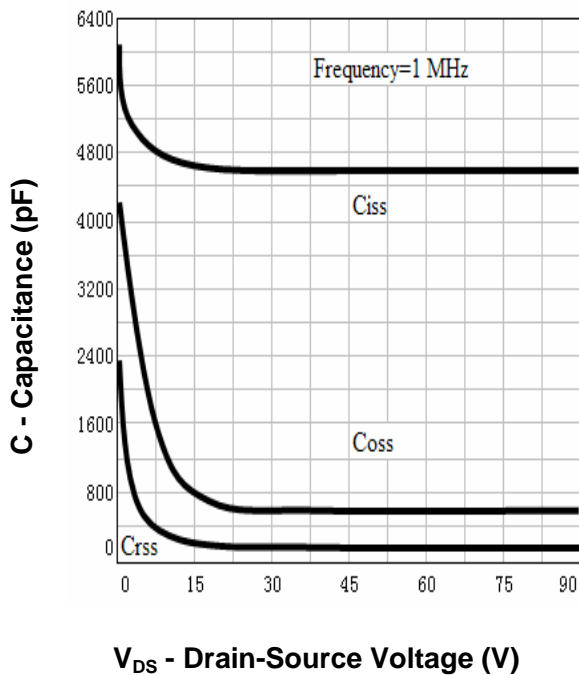
**Drain-Source On Resistance**



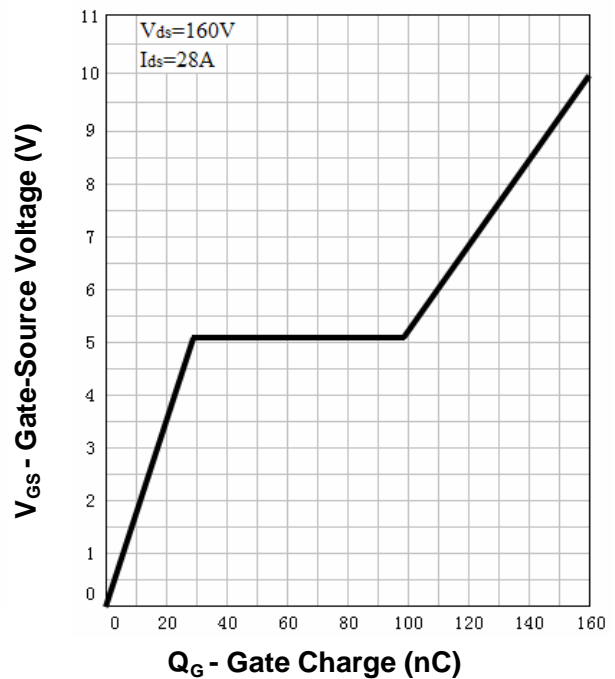
**Source-Drain Diode Forward**



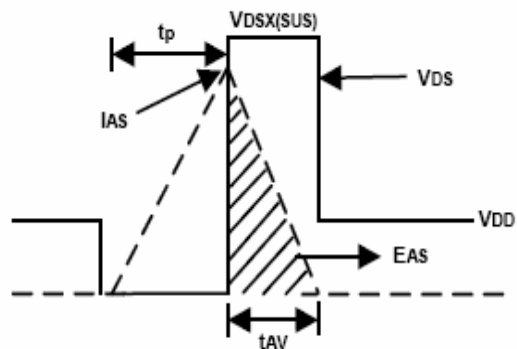
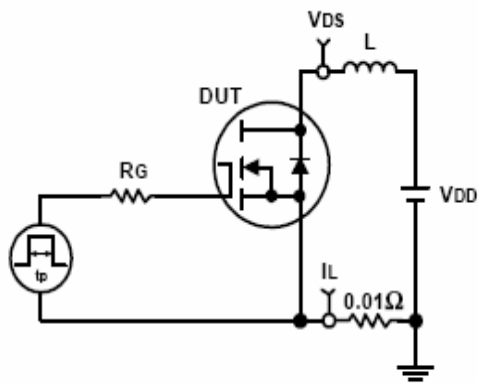
**Capacitance**



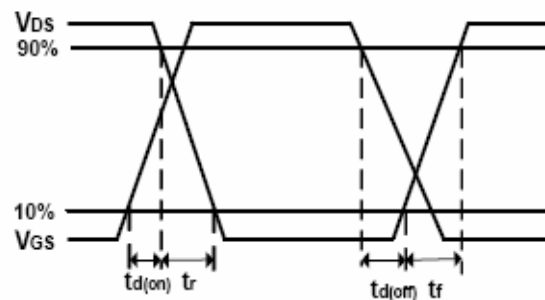
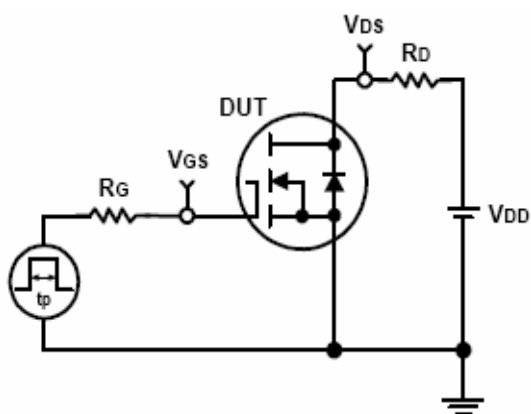
**Gate Charge**



### Avalanche Test Circuit and Waveforms



### Switching Time Test Circuit and Waveforms

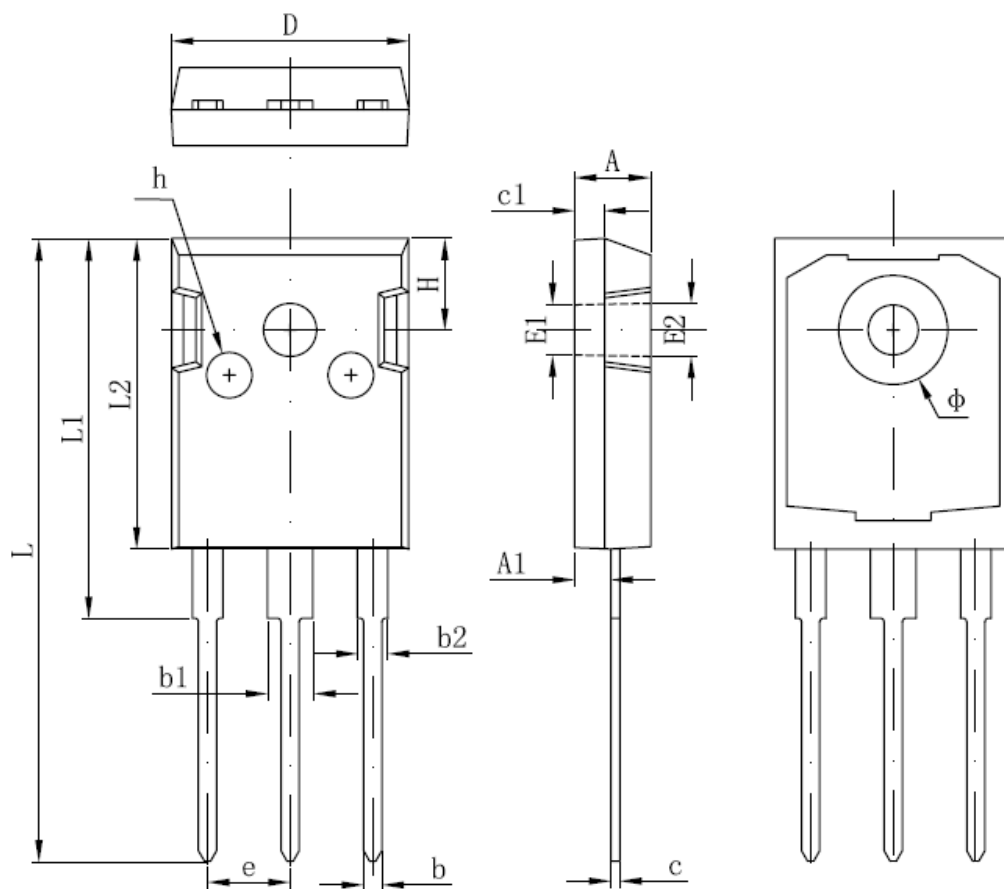


**Ordering and Marking Information**

<b>Device</b>	<b>Marking</b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU2H50Q	RU2H50Q	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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