

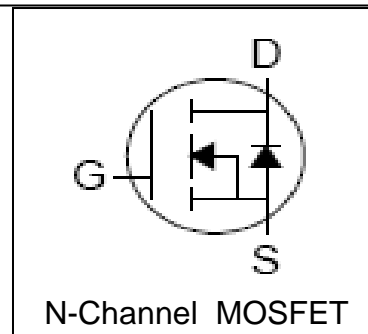
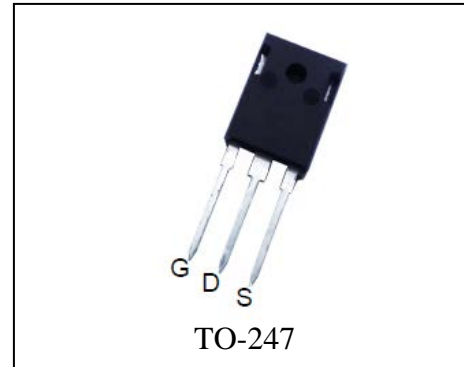
Features

- 150V/80A
 $R_{DS(ON)}=31m\Omega(Typ.) @ V_{GS}=10V$
- 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 ($T_A=25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	150	V
V_{GSS}	Gate-Source Voltage	± 25	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 80 ^①	A
Mounted on Large Heat Sink			
I_{DP}	300 μs Pulsed Drain Current Tested	$T_C=25^\circ\text{C}$ 300 ^②	A
I_D	Continue Drain Current($V_{GS}=10V$)	$T_C=25^\circ\text{C}$ 80 ^①	
		$T_C=100^\circ\text{C}$ 60	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 180	W
		$T_C=100^\circ\text{C}$ 90	
$R_{\theta JC}$	Thermal Resistance -Junction to Case	0.83	$^\circ\text{C}/\text{W}$
Drain-Source Avalanche Ratings			
E_{AS} ^③	Avalanche Energy ,Single Pulsed	169	mJ

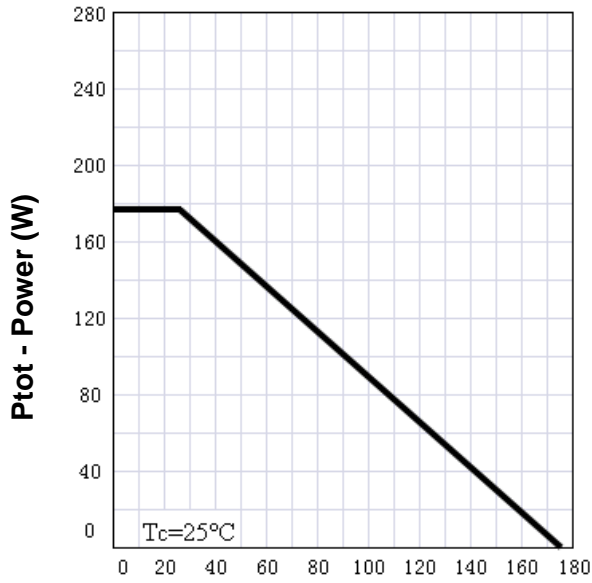
Electrical Characteristics ($T_A=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU80N15Q			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	150			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=150V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			1	μA
					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	$V_{GS}=\pm 25V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(4)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=40A$		31	36	m Ω
Diode Characteristics						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$			1.2	V
t_{rr}	Reverse Recovery Time	$I_{SD}=40A, dI_{SD}/dt=100A/\mu s$		68		ns
q_{rr}	Reverse Recovery Charge			130		nC
Dynamic Characteristics ⁽⁵⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.0		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=30V,$ Frequency=1.0MHz		3800		pF
C_{oss}	Output Capacitance			550		
C_{riss}	Reverse Transfer Capacitance			250		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=35V, R_L=35\Omega,$ $I_{DS}=1A, V_{GEN}=10V,$ $R_G=10\Omega$		18		ns
t_r	Turn-on Rise Time			32		
$t_{d(OFF)}$	Turn-off Delay Time			80		
t_f	Turn-off Fall Time			56		
Gate Charge Characteristics ⁽⁵⁾						
Q_g	Total Gate Charge	$V_{DS}=30V, V_{GS}=10V,$ $I_{DS}=40A$		90		nC
Q_{gs}	Gate-Source Charge			25		
Q_{gd}	Gate-Drain Charge			30		

- Notes:
- ① Calculated continuous current based on maximum allowable junction temperature.
 - ② Pulse width limited by safe operating area.
 - ③ Limited by $T_{Jmax}, I_{AS}=26A, V_{DD}=48V, R_G=50\Omega$, 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.

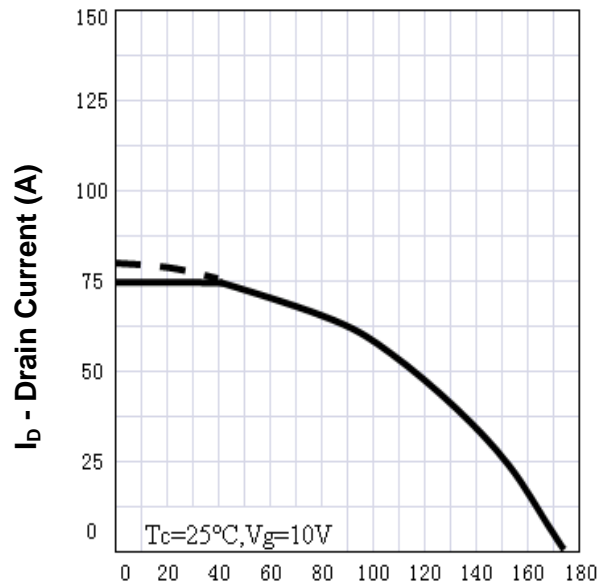
Typical Characteristics

Power Dissipation



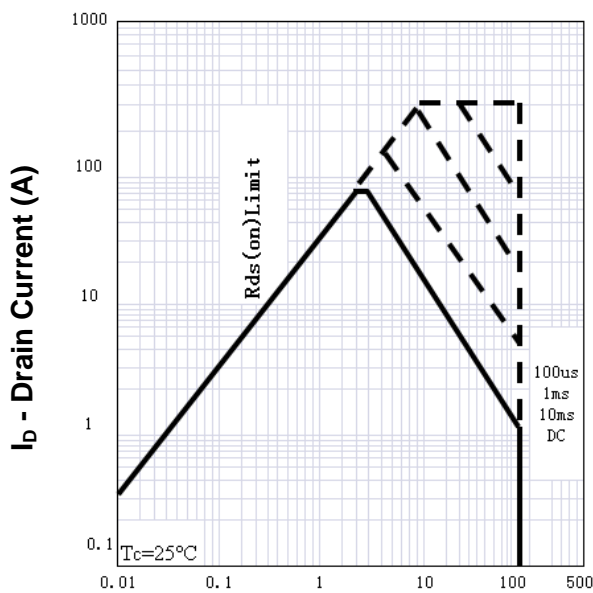
T_j - Junction Temperature (°C)

Drain Current



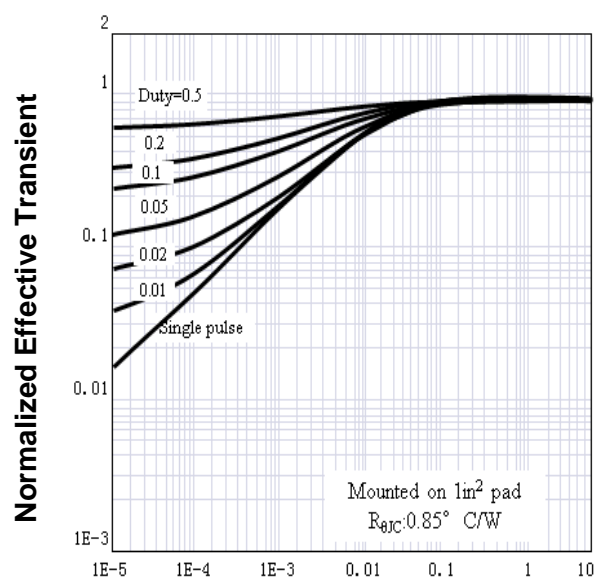
T_j - Junction Temperature (°C)

Safe Operation Area



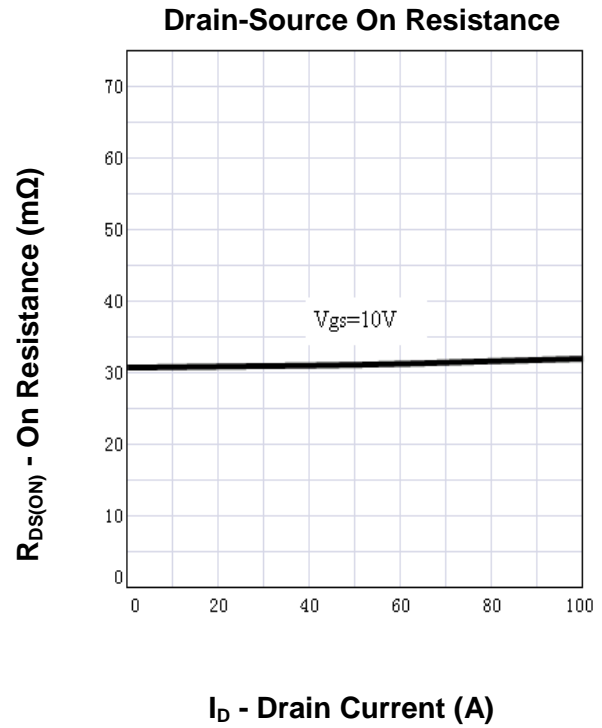
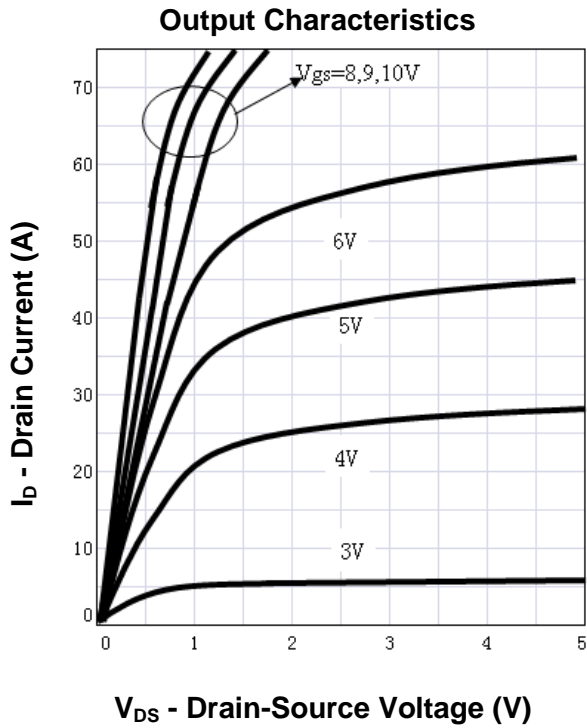
V_{DS} - Drain-Source Voltage (V)

Thermal Transient Impedance

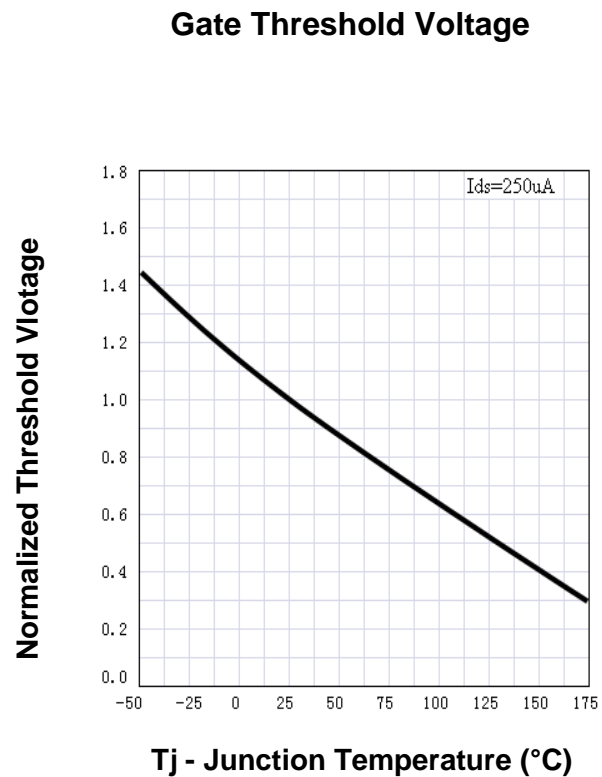
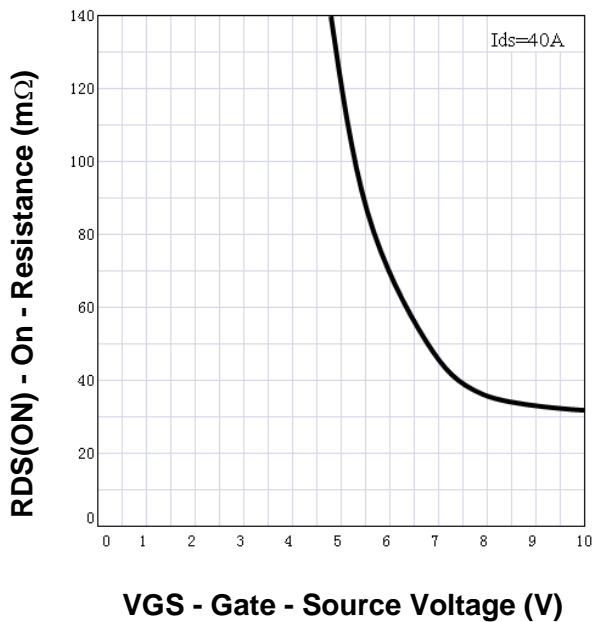


Square Wave Pulse Duration (sec)

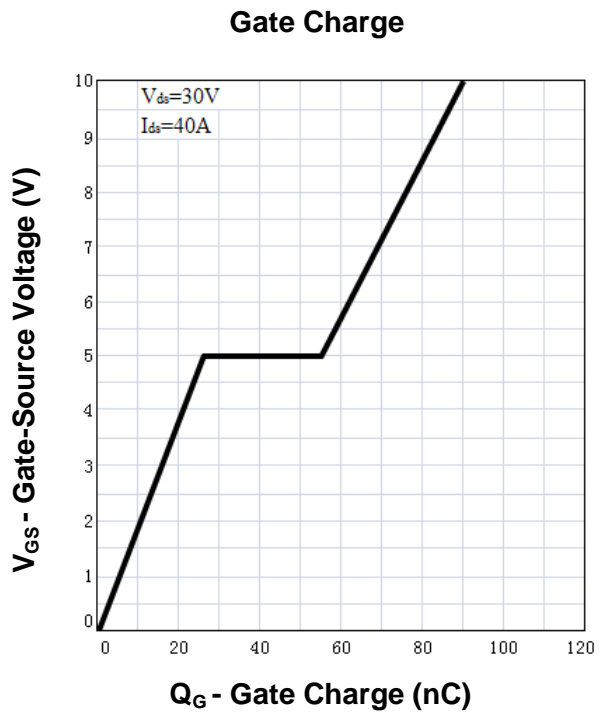
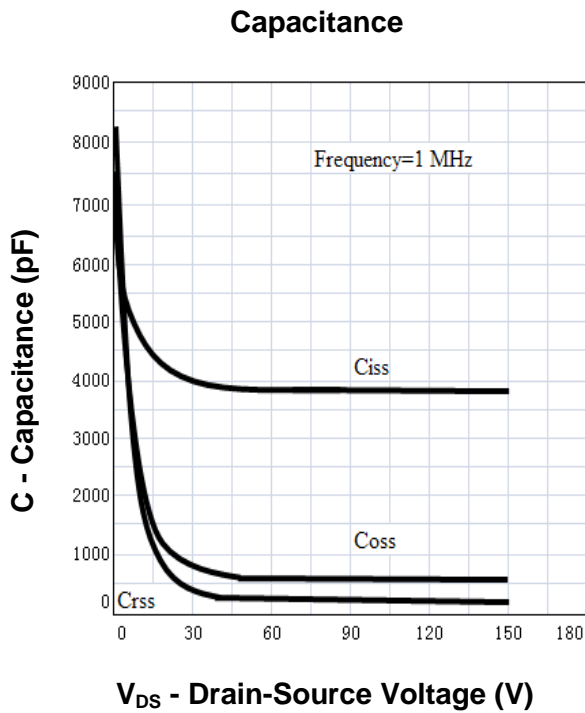
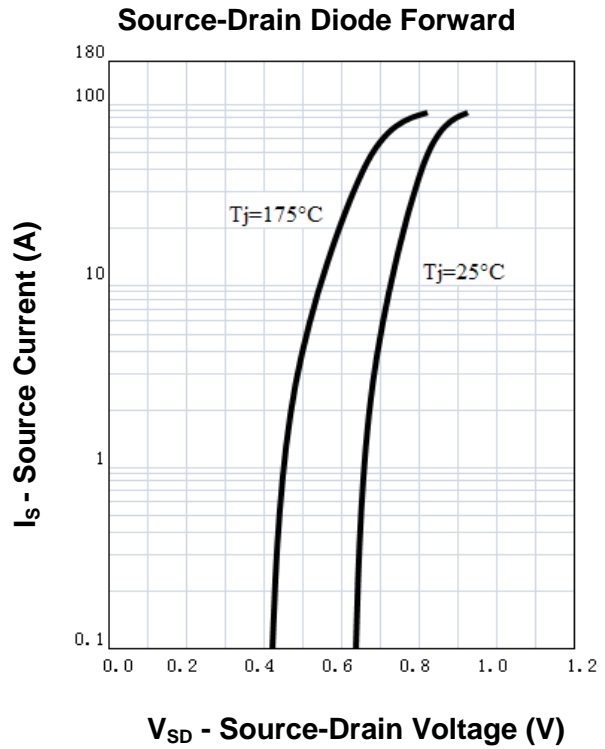
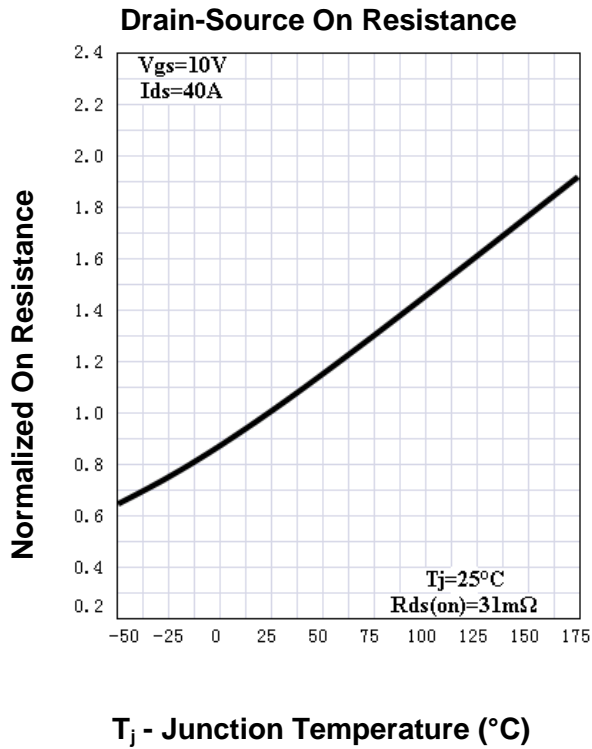
Typical Characteristics



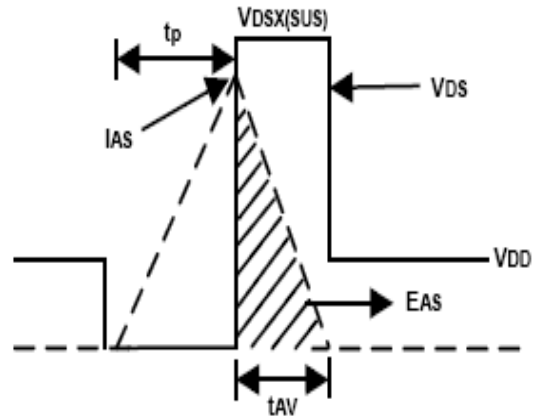
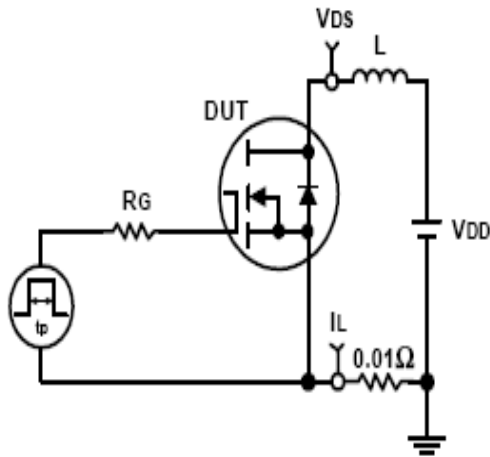
Drain-Source On Resistance



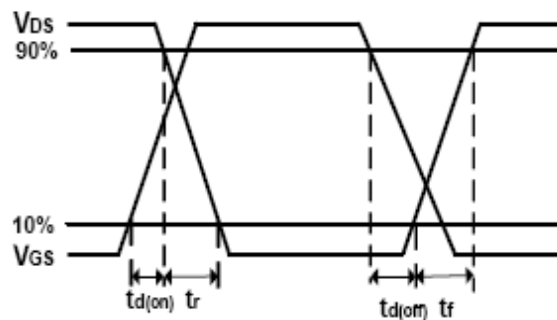
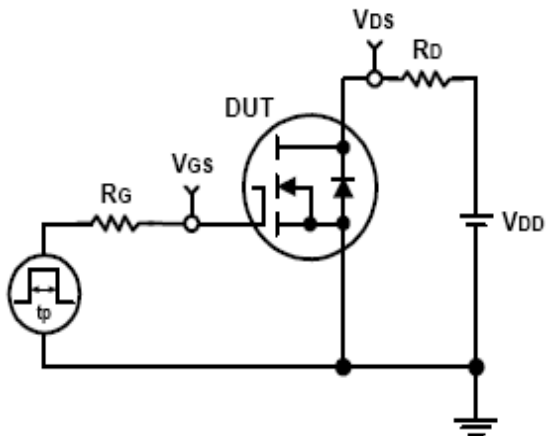
Typical Characteristics



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

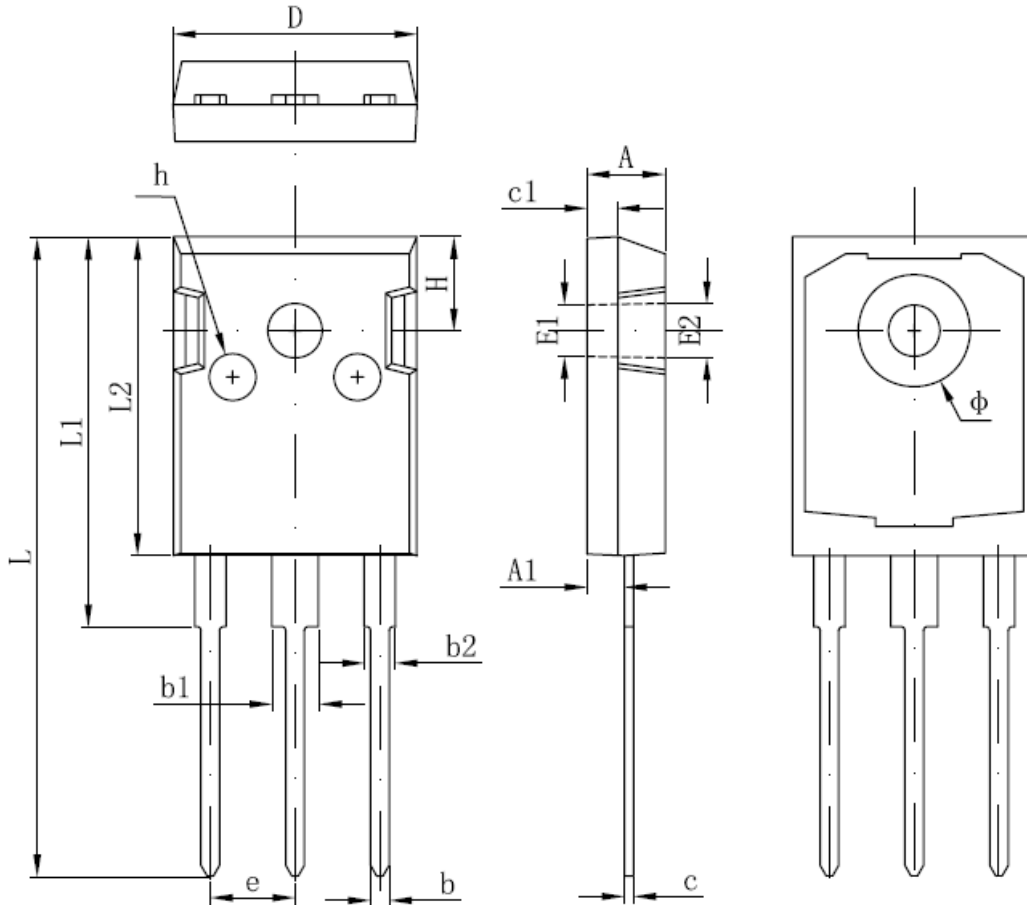


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU80N15Q	RU80N15Q	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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