

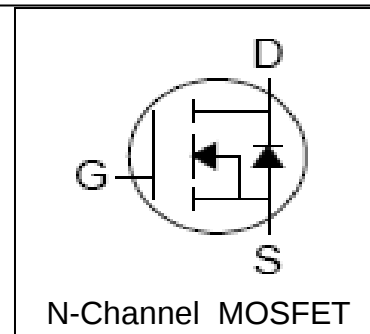
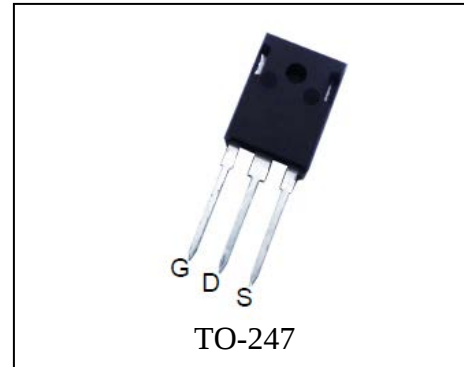
Features

- 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°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		150	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	80 ^①	A
Mounted on Large Heat Sink				
I _{DP}	300μs Pulsed Drain Current Tested	T _C =25°C	300 ^②	A
I _D	Continue Drain Current(V _{GS} =10V)	T _C =25°C	80 ^①	
		T _C =100°C	60	
P _D	Maximum Power Dissipation	T _C =25°C	180	W
		T _C =100°C	90	
R _{θJC}	Thermal Resistance -Junction to Case		0.83	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^③	Avalanche Energy ,Single Pulsed		169	mJ

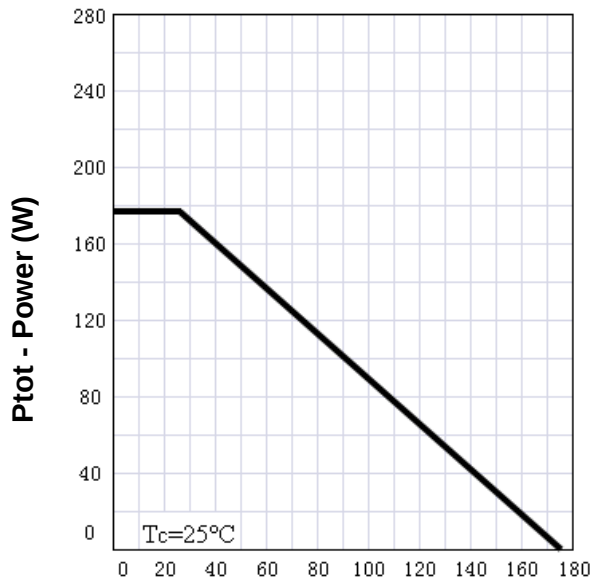
Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU80N15Q			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	150			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 150V, 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		31	36	mΩ
Diode Characteristics						
V _{SD} ^④	Diode Forward Voltage	I _{SD} =40 A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =40A, dI _{SD} /dt=100A/μs		68		ns
q _{rr}	Reverse Recovery Charge			130		nC
Dynamic Characteristics ^⑤						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.0		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} = 30V, Frequency=1.0MHz		3800		pF
C _{oss}	Output Capacitance			550		
C _{rss}	Reverse Transfer Capacitance			250		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =35V, R _L =35Ω, I _{DS} = 1A, V _{GEN} = 10V, R _G =10Ω		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.

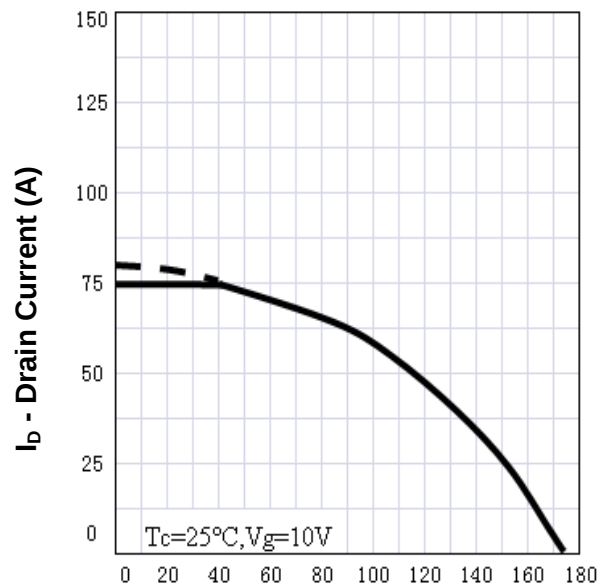
Typical Characteristics

Power Dissipation



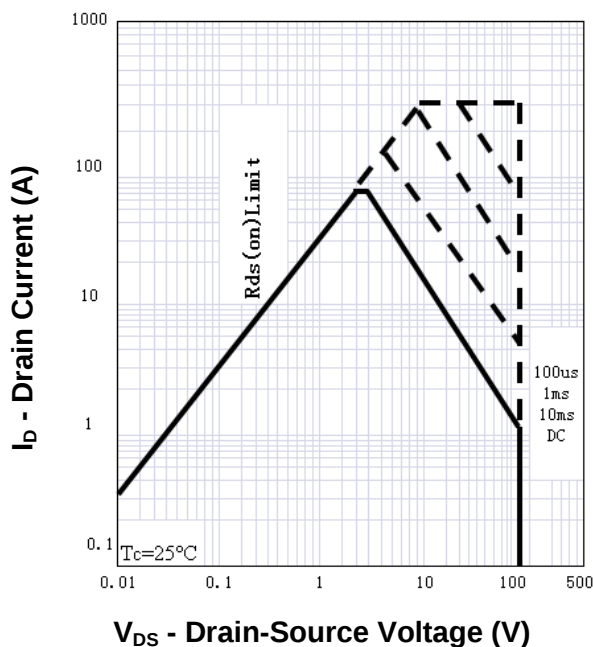
T_j - Junction Temperature ($^{\circ}\text{C}$)

Drain Current



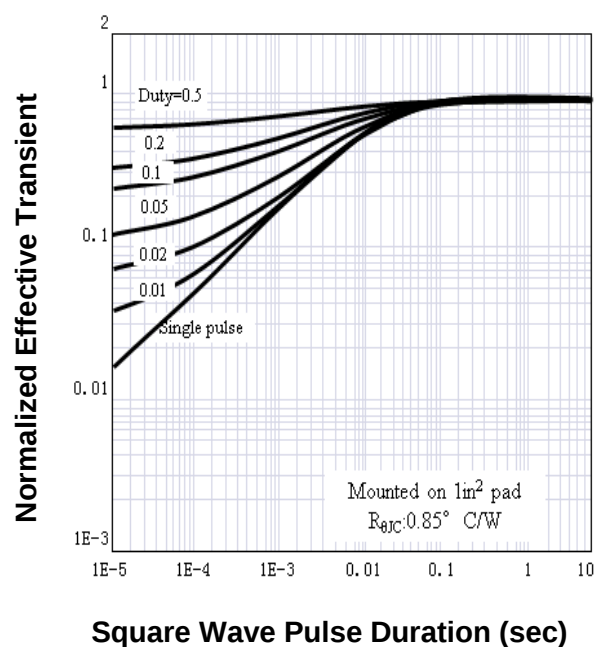
T_j - Junction Temperature ($^{\circ}\text{C}$)

Safe Operation Area

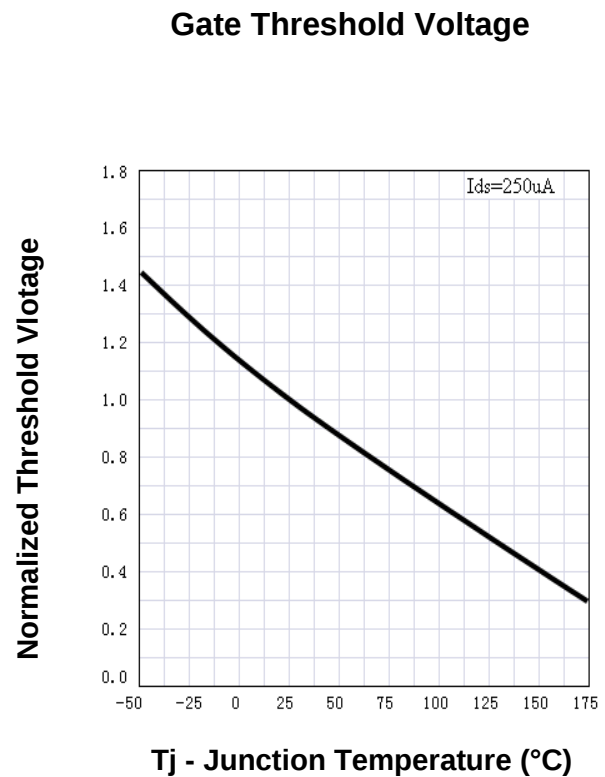
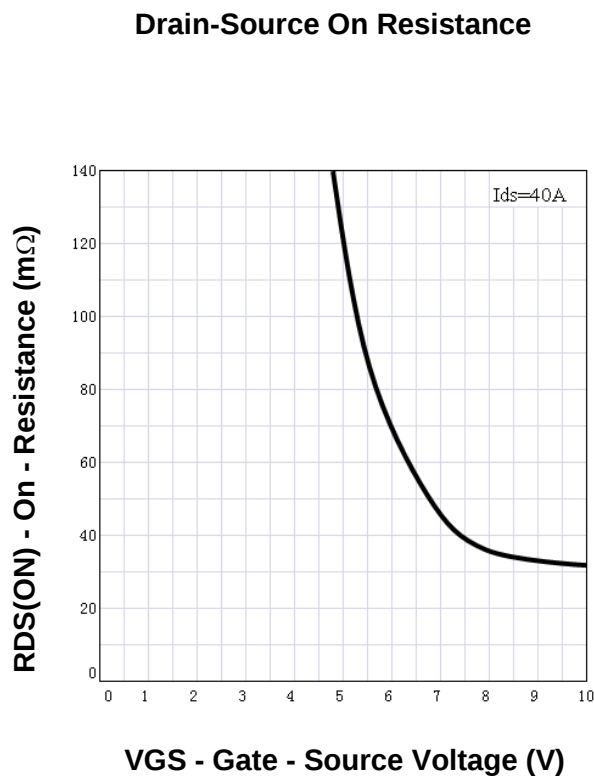
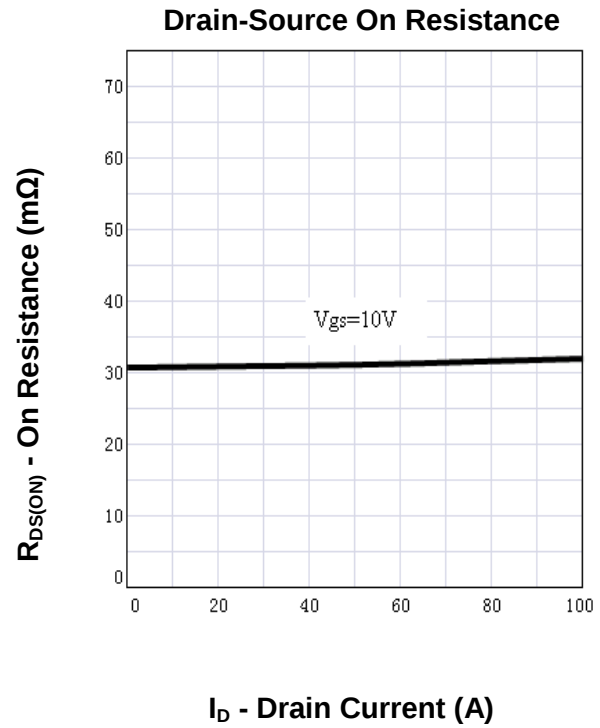
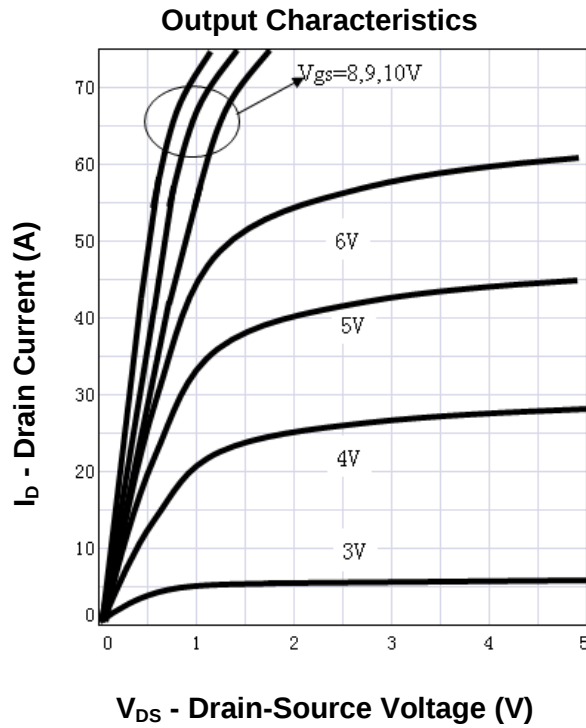


V_{DS} - Drain-Source Voltage (V)

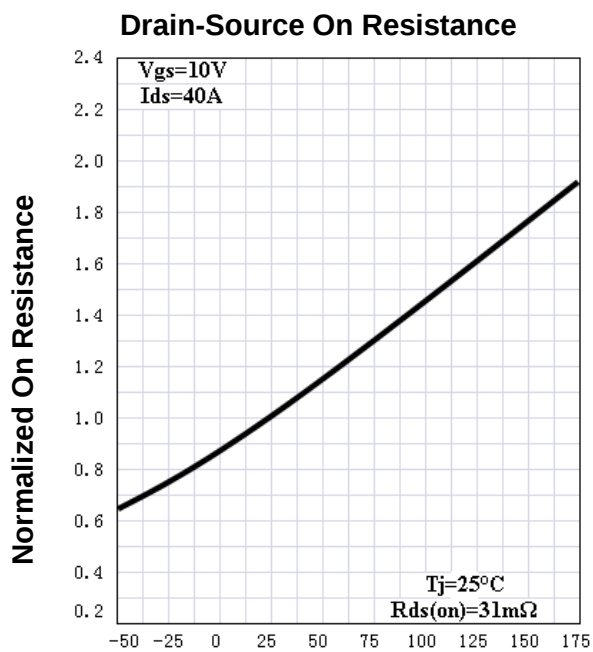
Thermal Transient Impedance



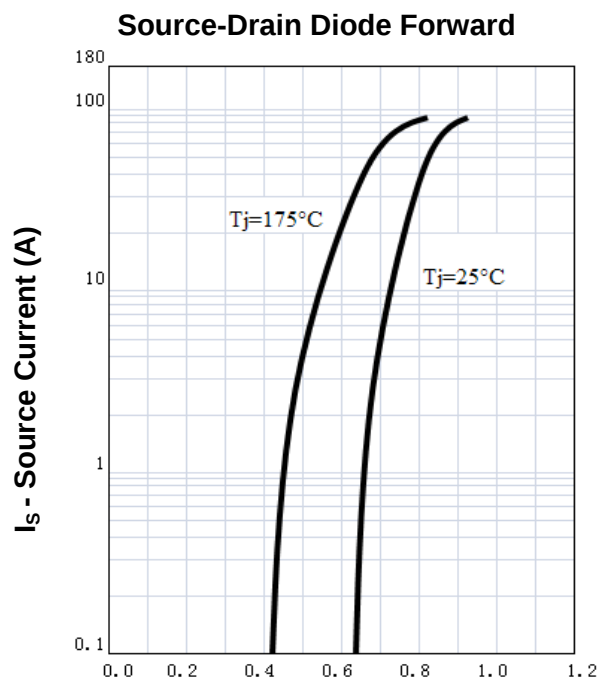
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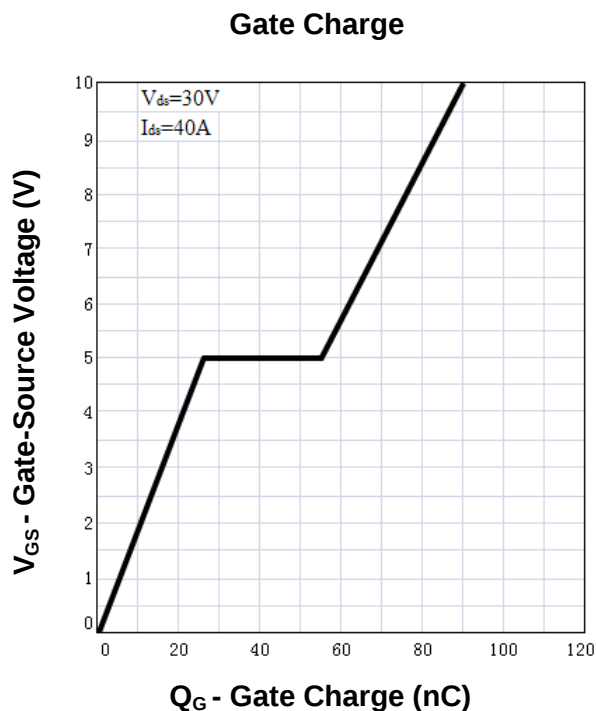
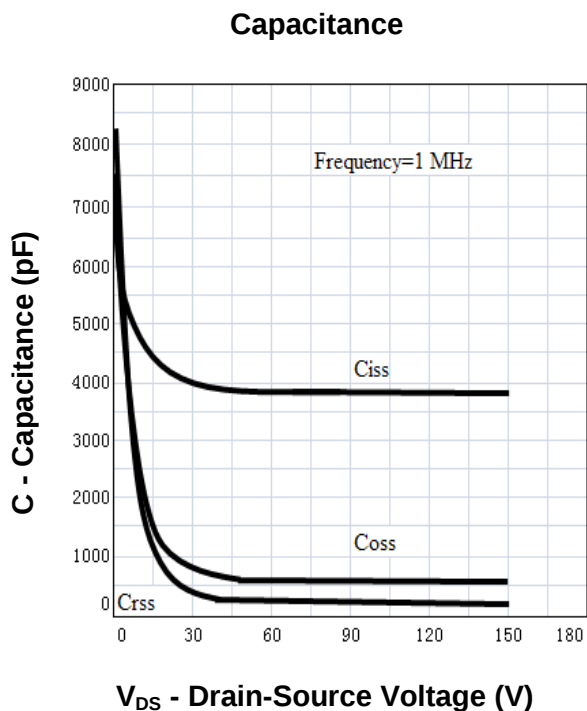
Typical Characteristics



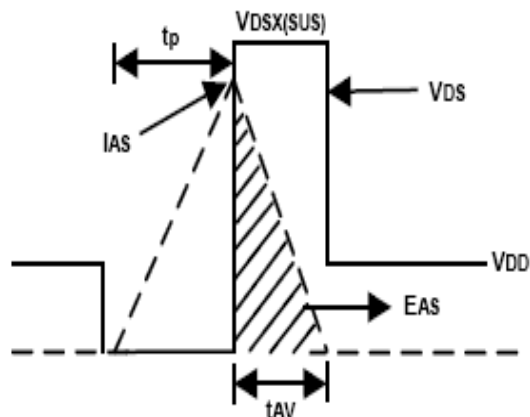
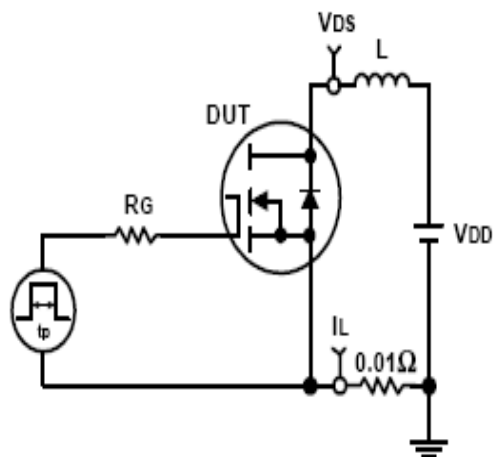
T_j - Junction Temperature ($^{\circ}C$)



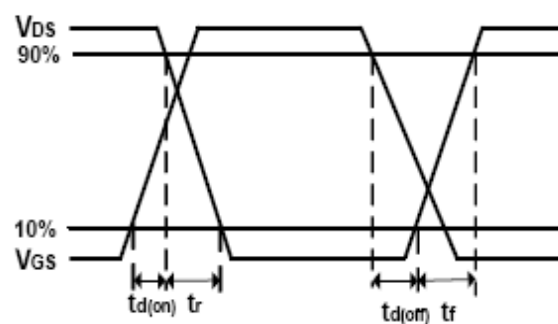
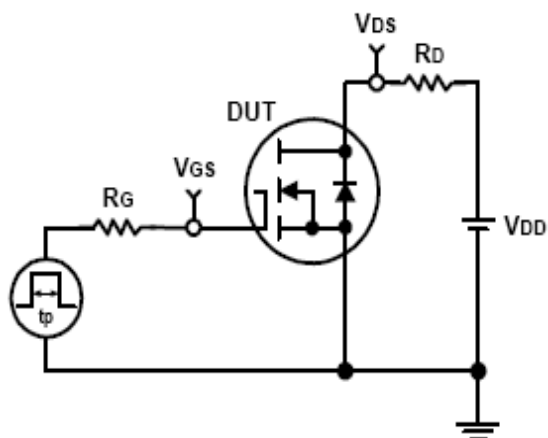
V_{SD} - Source-Drain Voltage (V)



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

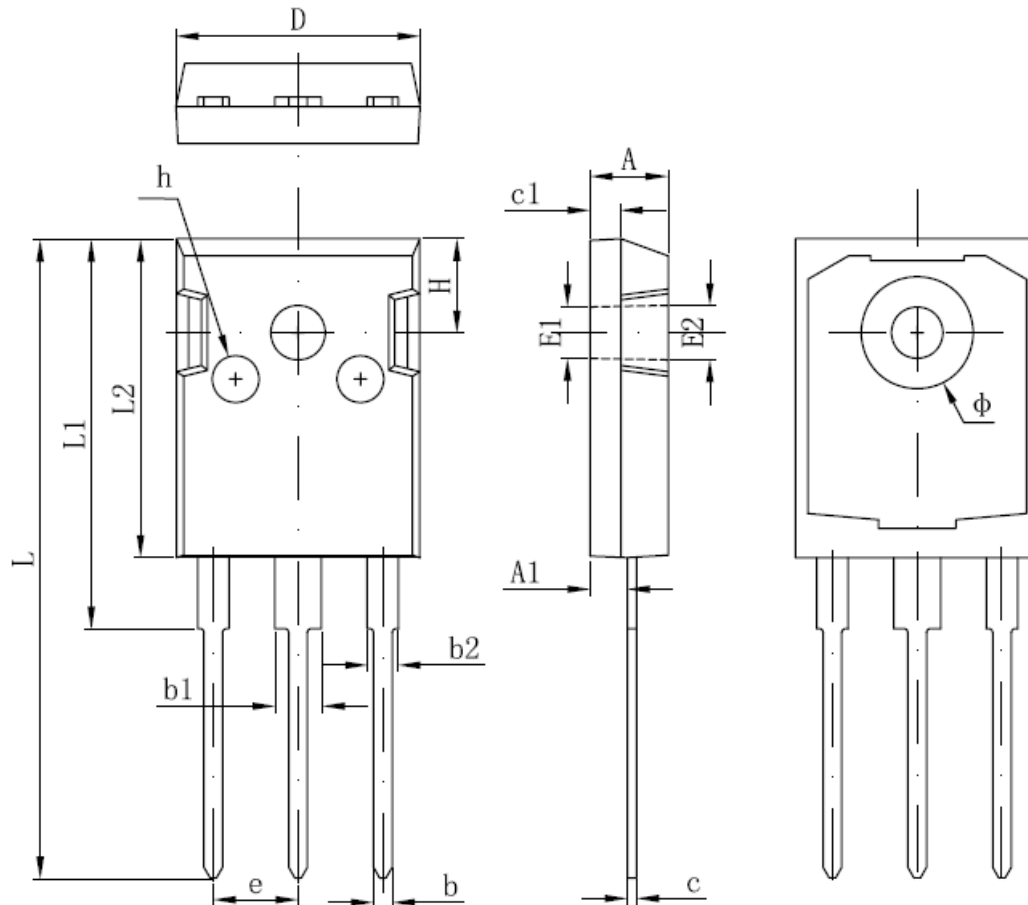


Ordering and Marking Information

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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