

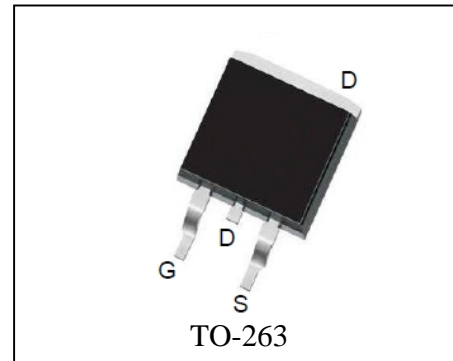
## Features

- 80V/80A,  
 $R_{DS(ON)} = 9m$  (tpy.) @  $V_{GS} = 10V$
- Super High Dense Cell Design
- Ultra Low On-Resistance
- 100% avalanche tested
- Lead Free and Green Devices Available  
 (RoHS Compliant)

## Applications

- DC-DC Converters

## Pin Description



## Absolute Maximum Ratings

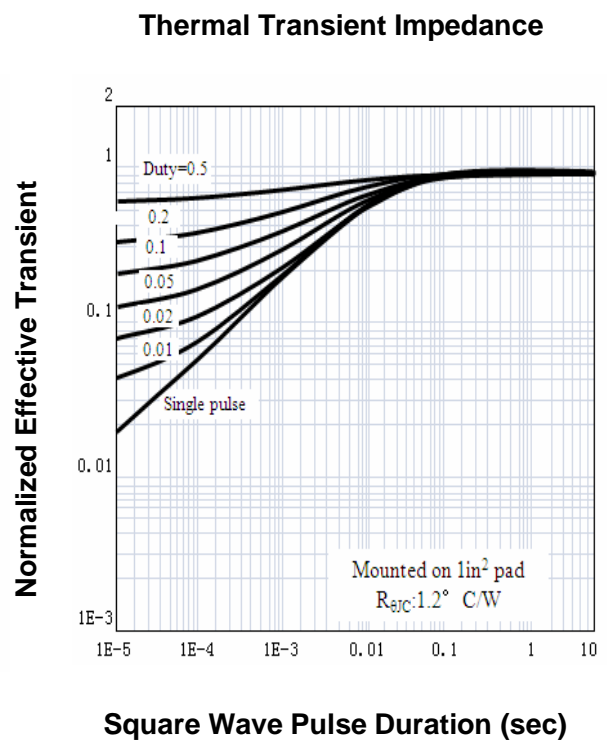
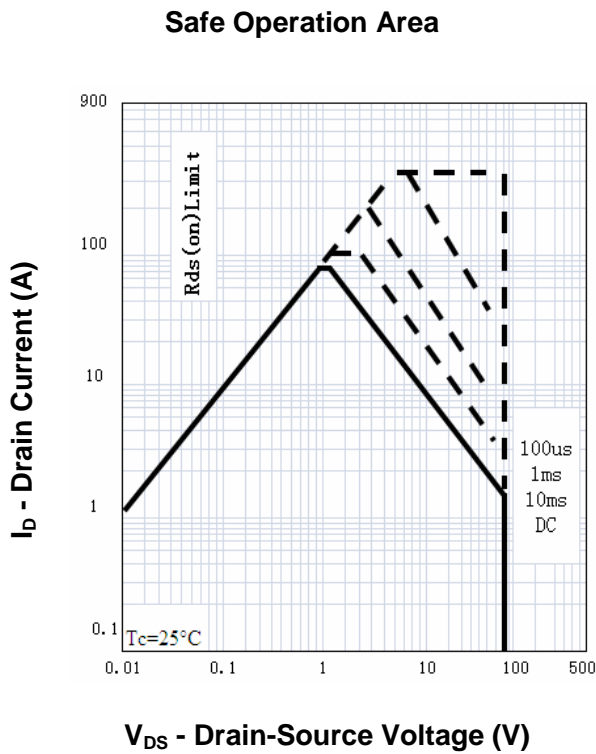
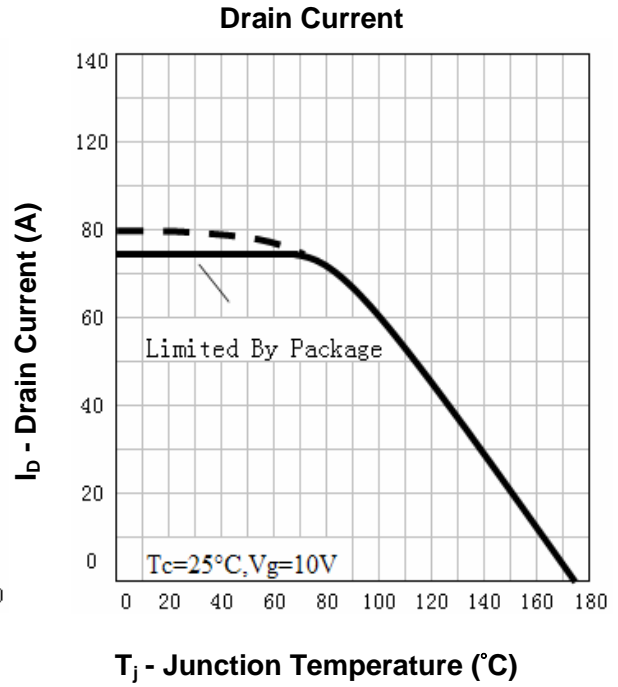
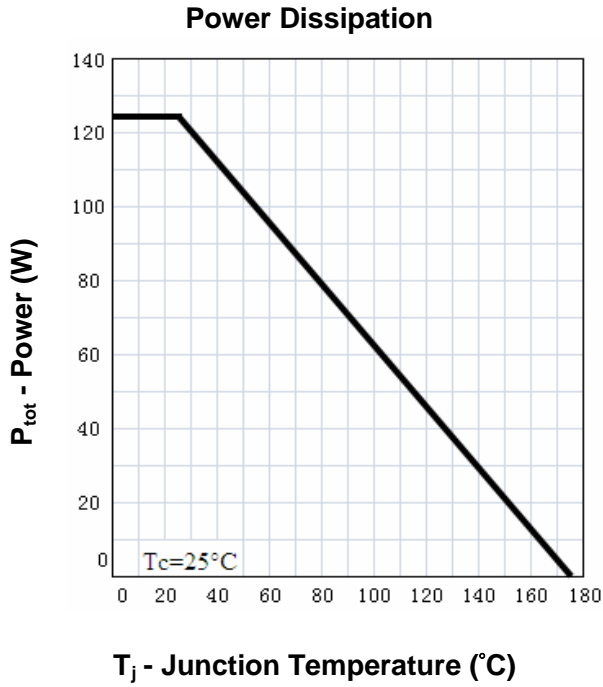
Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_C = 25^\circ\text{C}$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	80	V
$V_{GSS}$	Gate-Source Voltage	$\pm 25$	
$T_J$	Maximum Junction Temperature	175	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C = 25^\circ\text{C}$ 80 <sup>①</sup>	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_C = 25^\circ\text{C}$ 320 <sup>②</sup>	A
$I_D$	Continuous Drain Current	$T_C = 25^\circ\text{C}$ 80 <sup>①</sup>	A
		$T_C = 100^\circ\text{C}$ 59	
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ\text{C}$ 125	W
		$T_C = 100^\circ\text{C}$ 62.5	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.2	$^\circ\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}$ <sup>③</sup>	Avalanche Energy, Single Pulsed	410	mJ

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

Symbol	Parameter	Test Condition	RU8080S			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	80			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			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	$V_{GS}=10V, I_{DS}=40A$		9	11	m $\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=40A, V_{GS}=0V$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=40A, di_{SD}/dt=100A/\mu s$		62		ns
$Q_{rr}$	Reverse Recovery Charge			183		nC
<b>Dynamic Characteristics</b> <sup>(5)</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.3		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=40V,$ Frequency=1.0MHz		4120		pF
$C_{oss}$	Output Capacitance			520		
$C_{riss}$	Reverse Transfer Capacitance			200		
$t_{d(ON)}$	Turn-on Delay Time			34		
$t_r$	Turn-on Rise Time	$V_{DD}=40V, R_L=1\Omega,$ $I_{DS}=40A, V_{GEN}=10V,$ $R_G=4.7\Omega$		95		
$t_{d(OFF)}$	Turn-off Delay Time			103		
$t_f$	Turn-off Fall Time			33		
<b>Gate Charge Characteristics</b> <sup>(5)</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=64V, V_{GS}=10V,$ $I_{DS}=40A$		58		nC
$Q_{gs}$	Gate-Source Charge			15		
$Q_{gd}$	Gate-Drain Charge			19		

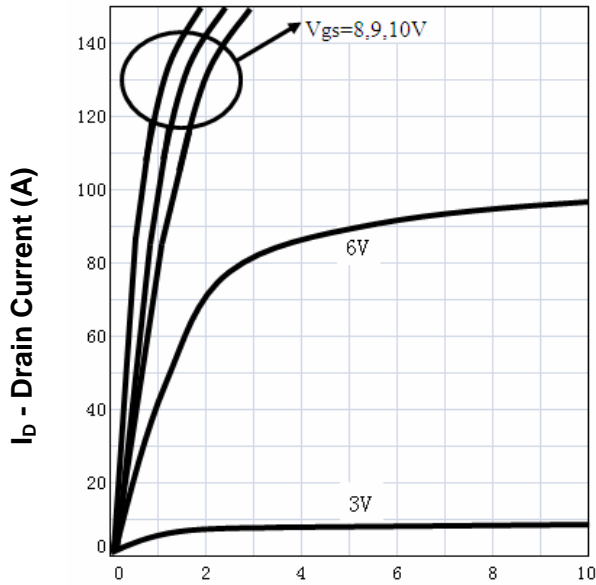
- Notes:
- ① Calculated continuous current based on maximum allowable junction temperature.
  - ② Pulse width limited by safe operating area.
  - ③ Limited by  $T_{Jmax}, I_{AS}=29A, V_{DD}=48V, R_G=50\Omega$ , Starting  $T_J=25^\circ\text{C}$ .
  - ④ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑤ Guaranteed by design, not subject to production testing.

**Typical Characteristics**



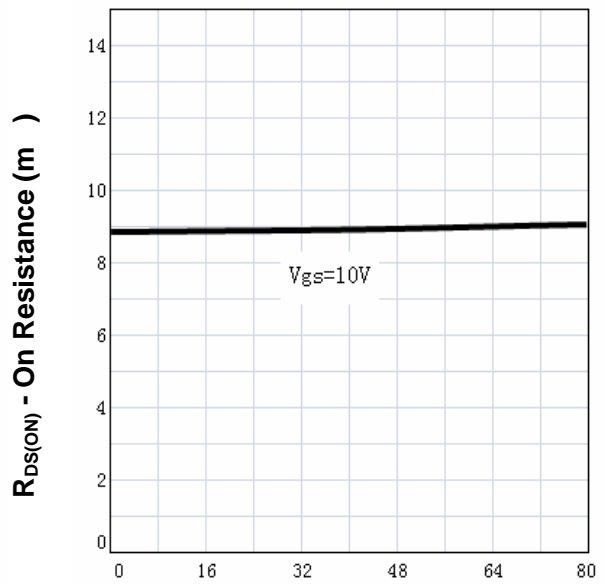
**Typical Characteristics**

**Output Characteristics**



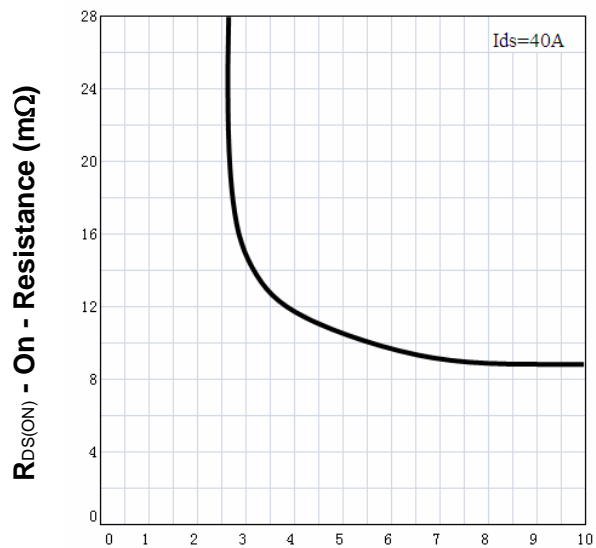
$V_{DS}$  - Drain-Source Voltage (V)

**Drain-Source On Resistance**



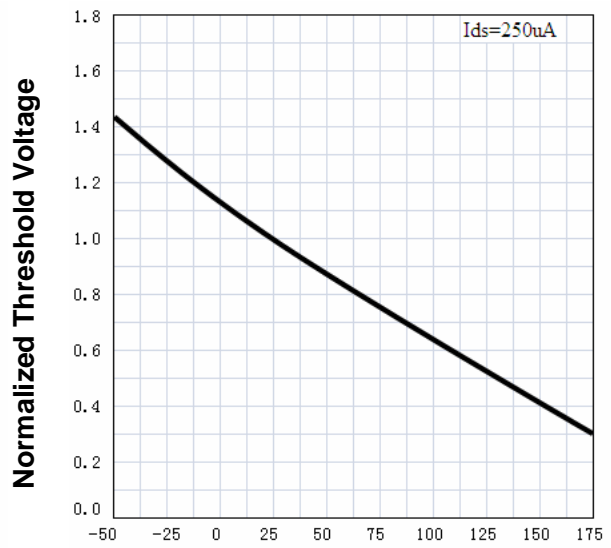
$I_D$  - Drain Current (A)

**Drain-Source On Resistance**



$V_{GS}$  - Gate-Source Voltage (V)

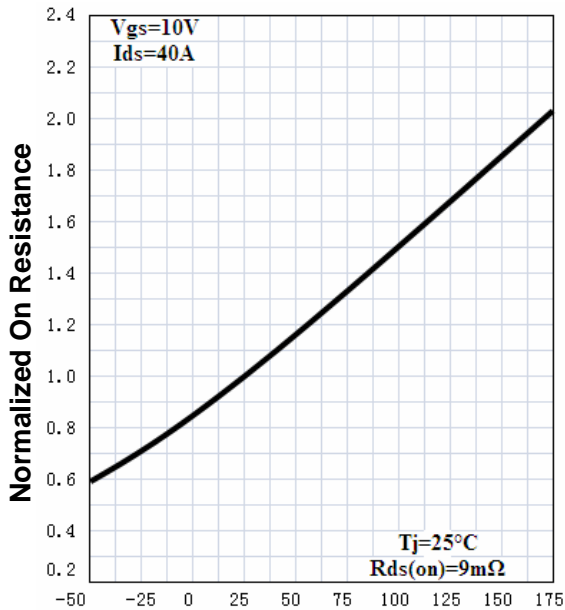
**Gate Threshold Voltage**



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

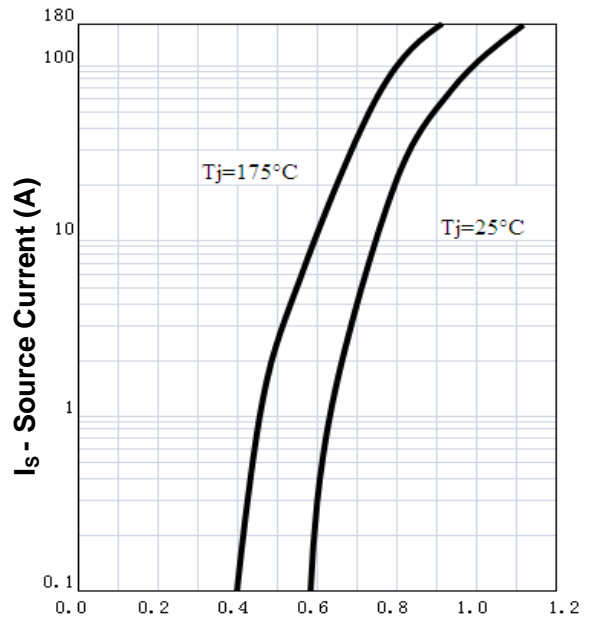
**Typical Characteristics**

**Drain-Source On Resistance**



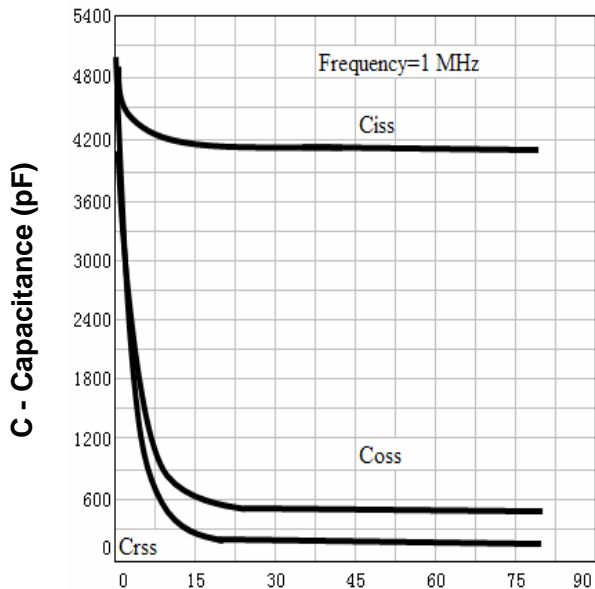
**T<sub>J</sub> - Junction Temperature (°C)**

**Source-Drain Diode Forward**



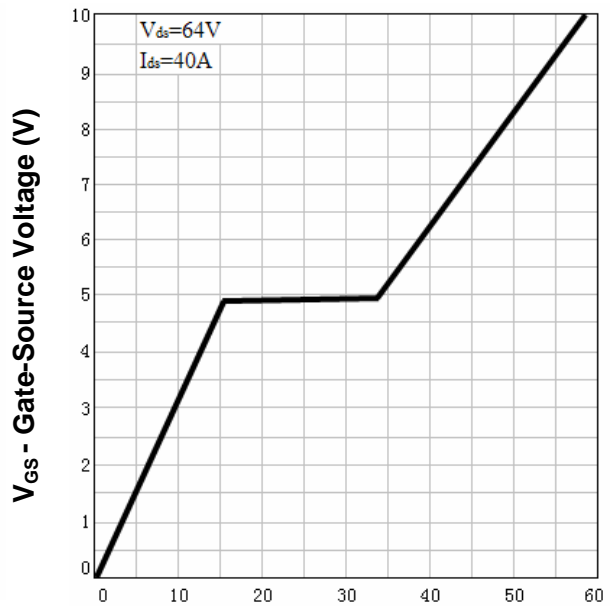
**V<sub>SD</sub> - Source-Drain Voltage (V)**

**Capacitance**



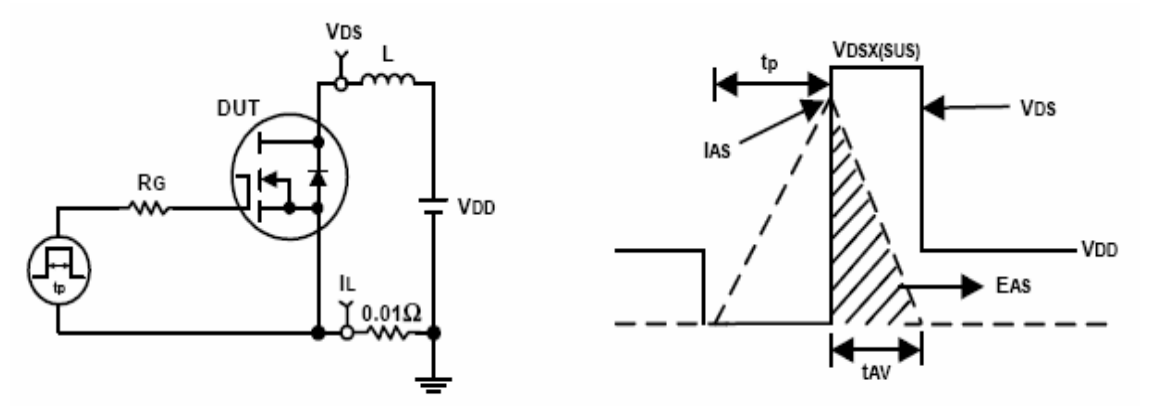
**V<sub>DS</sub> - Drain-Source Voltage (V)**

**Gate Charge**

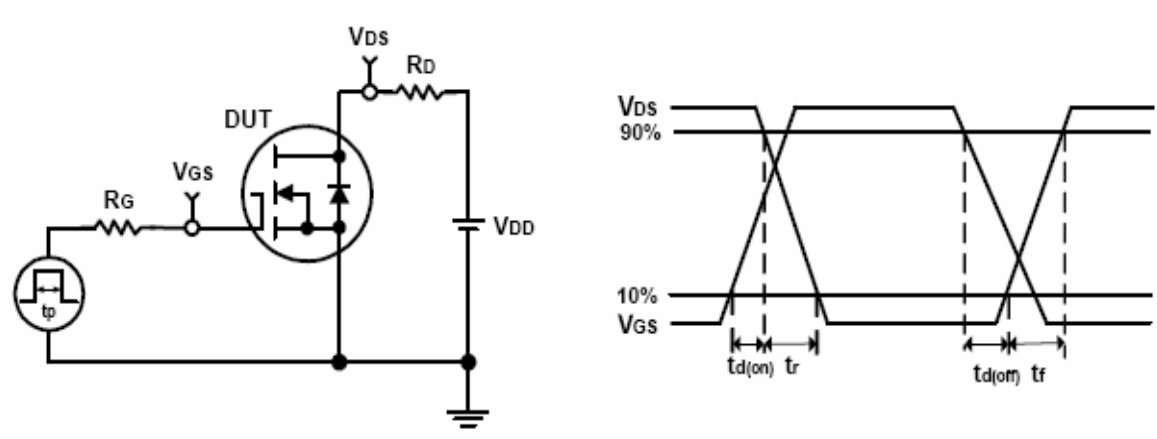


**Q<sub>G</sub> - Gate Charge (nC)**

**Avalanche Test Circuit and Waveforms**



**Switching Time Test Circuit and Waveforms**

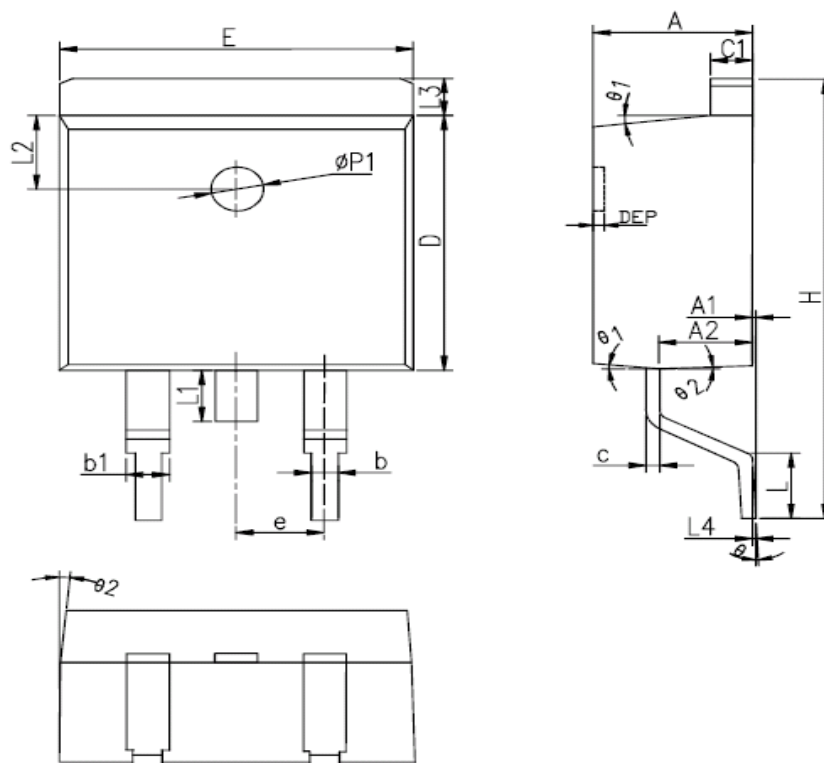


**Ordering and Marking Information**

<b>Device</b>	<b>Marking</b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU8080S	RU8080S	TO-263	Tube	50	-	-

**Package Information**

**TO-263-2L**



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185	L	2.00	2.30	2.60	0.079	0.090	0.102
A1	0	0.10	0.25	0	0.004	0.010	L3	1.17	1.27	1.40	0.046	0.050	0.055
A2	2.59	2.69	2.79	0.102	0.106	0.110	L1	-	-	1.70	-	-	0.067
b	0.77	-	0.90	0.030	-	0.035	L4	0.25BSC			0.01BSC		
b1	1.23	-	1.36	0.048	-	0.052	L2	2.50REF.			0.098REF.		
c	0.34	-	0.47	0.013	-	0.019	θ	0°	-	8°	0°	-	8°
C1	1.22	-	1.32	0.048	-	0.052	θ 1	5°	7°	9°	5°	7°	9°
D	8.60	8.70	8.80	0.338	0.343	0.346	θ 2	1°	3°	5°	1°	3°	5°
E	10.00	10.16	10.26	0.394	0.4	0.404	DEP	0.05	0.10	0.20	0.002	0.004	0.008
e	2.54BSC			0.1BSC			Øp1	1.40	1.50	1.60	0.055	0.059	0.063
H	14.70	15.10	15.50	0.579	0.594	0.610							

ALL DIMENSIONS REFER TO JEDEC STANDARD  
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS



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