

Features

- 85V/120A,
- $R_{DS(ON)} = 4.6m\Omega(Typ.)@V_{GS}=10V$
- Uses Ruichips advanced SGT™ technology
- Ultra Low On-Resistance
- Excellent $Q_g \times R_{DS(on)}$ Product
- 100% Avalanche Tested
- Fast Switching and Fully Avalanche Rated
- Lead Free and Green Devices (RoHS Compliant)

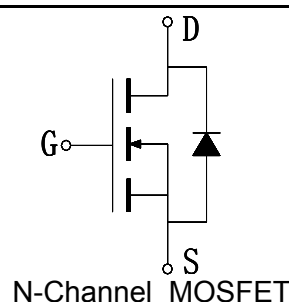
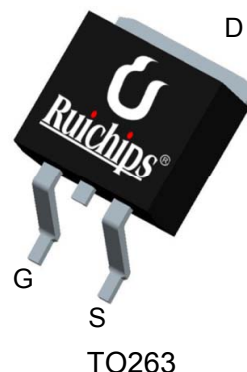


Halogen-Free

Applications

- Motor Drives
- Uninterruptible Power Supplies
- DC/DC Converter
- General Purpose Applications
- Synchronous Rectification for Flyback Converters

Pin Description



Absolute Maximum Ratings

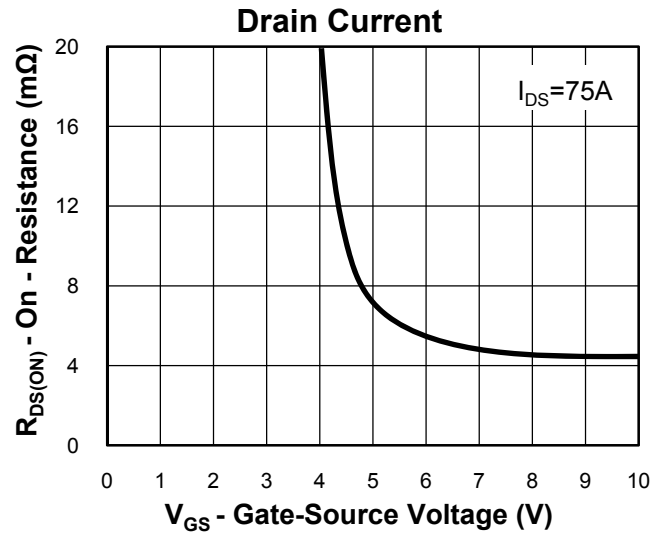
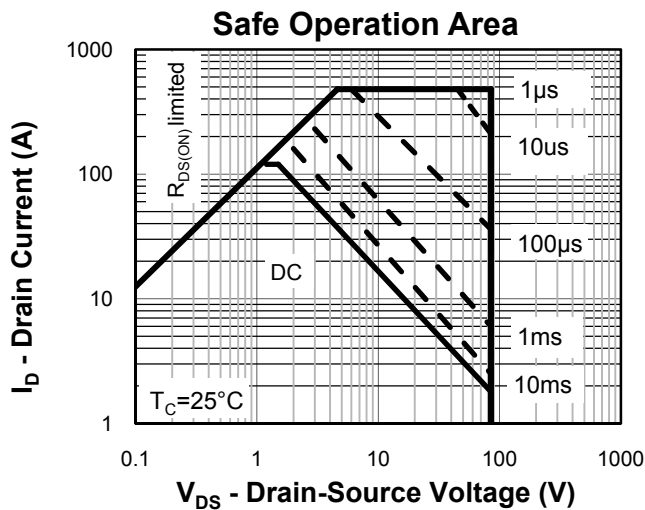
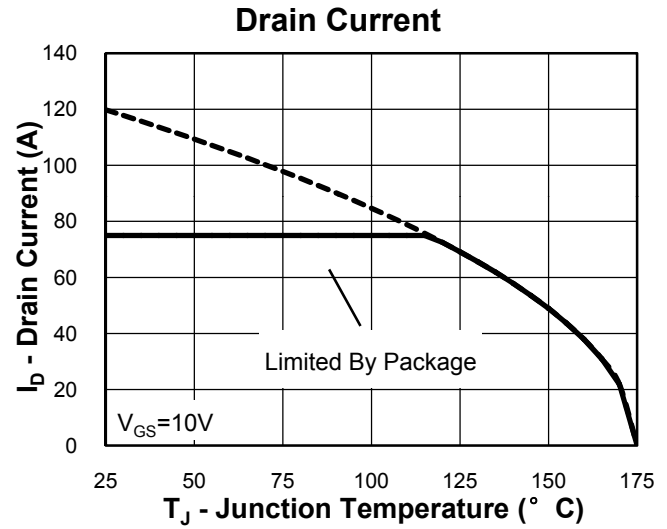
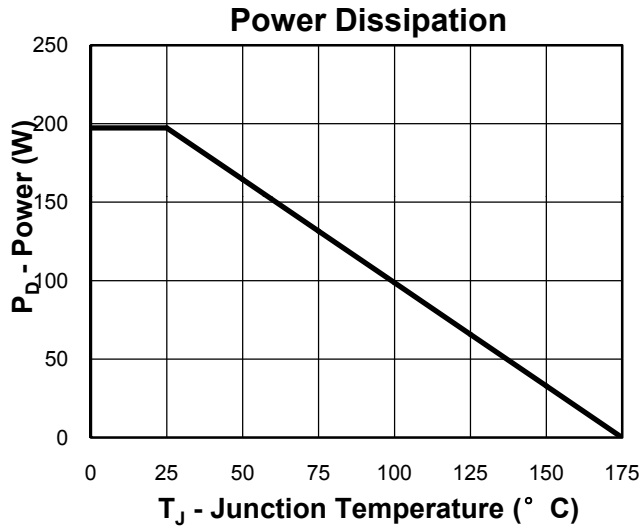
Symbol	Parameter	Rating	Unit
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	85	V
V_{GSS}	Gate-Source Voltage	± 20	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 120	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 480	A
$I_D^{②}$	Continuous Drain Current($V_{GS}=10V$)	$T_C=25^\circ\text{C}$ 120	A
		$T_C=100^\circ\text{C}$ 85	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 197	W
		$T_C=100^\circ\text{C}$ 98	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.76	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	56	$^\circ\text{C/W}$
Drain-Source Avalanche Ratings			
$E_{AS}^{③}$	Avalanche Energy, Single Pulsed	441	mJ

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

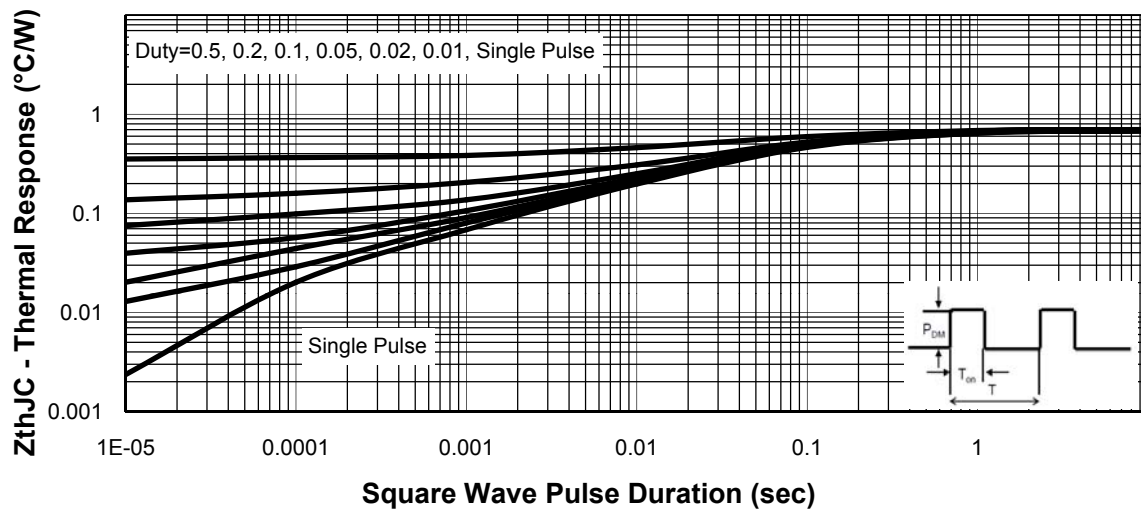
Symbol	Parameter	Test Condition	RUH85120S			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	85			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =85V, V _{GS} =0V			1	μA
			T _J =125°C		30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2		4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
R _{DS(ON)} ④	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =75A		4.6	5.5	mΩ
			T _J =150°C		8.8	13
Diode Characteristics						
V _{SD} ④	Diode Forward Voltage	I _{SD} =75A, V _{GS} =0V		0.9	1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =75A, dI _{SD} /dt=100A/μs		38	50	ns
Q _{rr}	Reverse Recovery Charge			36	50	nC
Dynamic Characteristics⑤						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.1	1.6	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =40V, Frequency=1.0MHz		2400	3000	pF
C _{oss}	Output Capacitance			890	1300	
C _{rss}	Reverse Transfer Capacitance			14	25	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =40V, I _{DS} =75A, V _{GEN} =10V, R _G =4.7Ω		12.8	20	ns
t _r	Turn-on Rise Time			26.5	40	
t _{d(OFF)}	Turn-off Delay Time			13.5	20	
t _f	Turn-off Fall Time			13	20	
Gate Charge Characteristics⑤						
Q _g	Total Gate Charge	V _{DS} =68V, V _{GS} =10V, I _{DS} =75A		36	55	nC
Q _{gs}	Gate-Source Charge			11	20	
Q _{gd}	Gate-Drain Charge			8	16	

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 75A.
 - ③ This value is based on starting $T_J = 25^{\circ}\text{C}$, $L = 0.5\text{mH}$, $R_G = 50\Omega$, $I_{AS} = 42A$, $V_{DD}=48V$; 100% FT tested at $L = 0.5\text{mH}$, $I_{AS} = 30A$.
 - ④ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑤ Guaranteed by design, not subject to production testing.

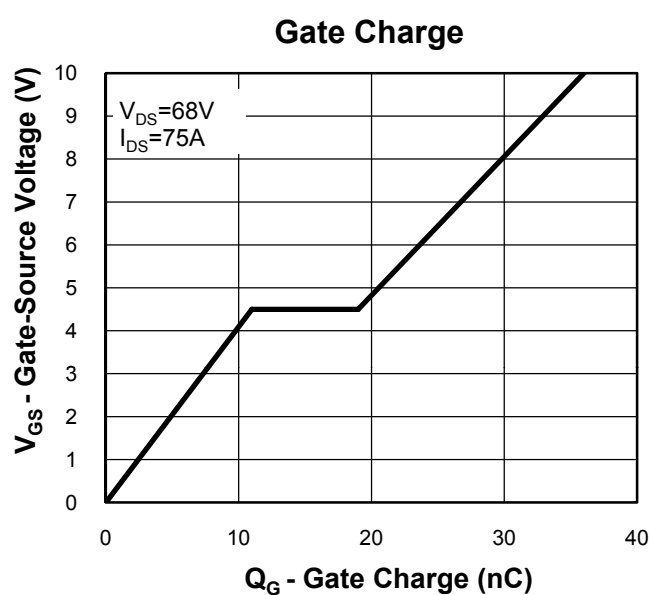
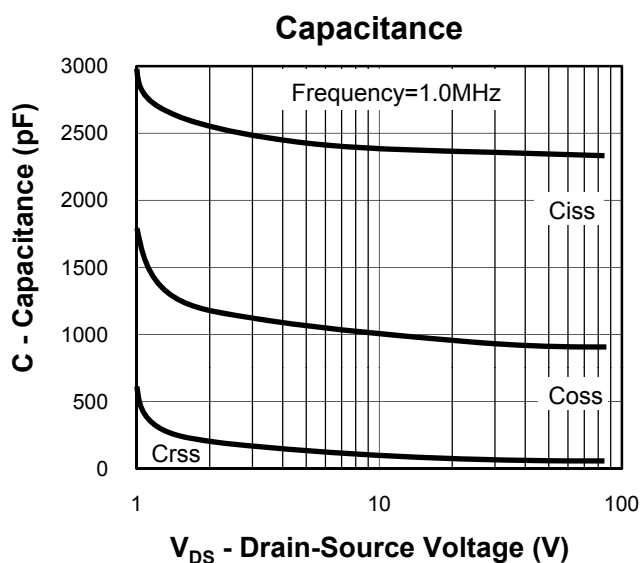
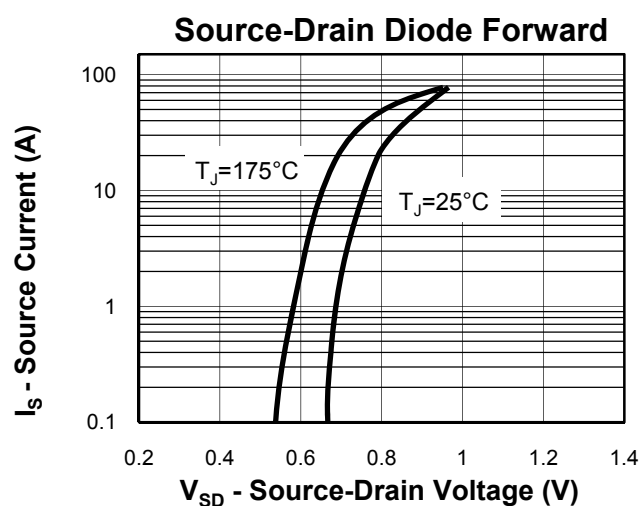
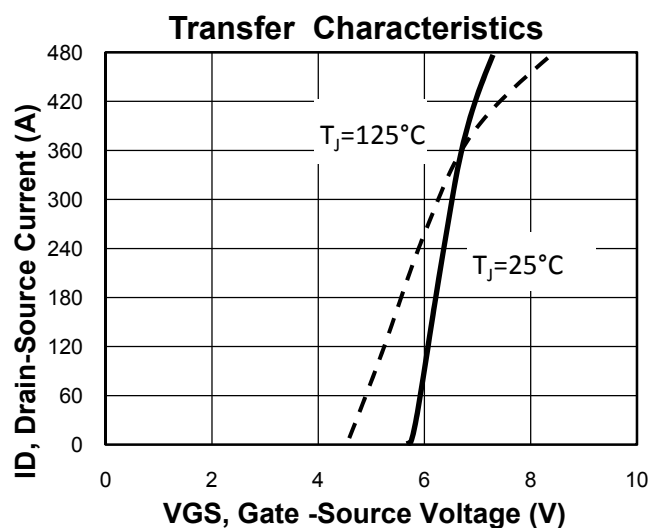
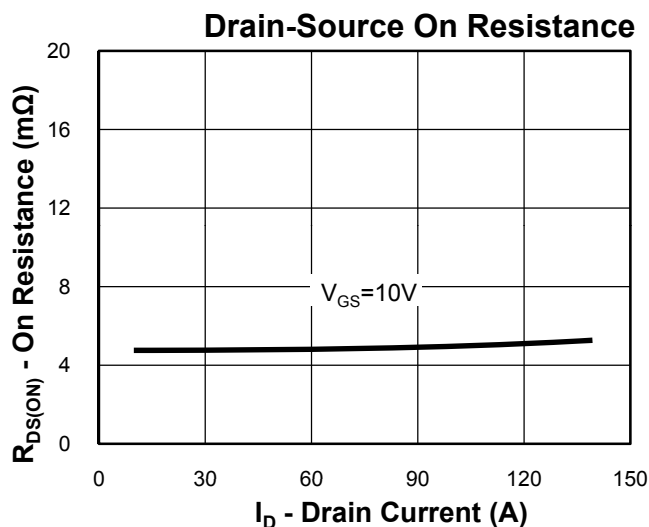
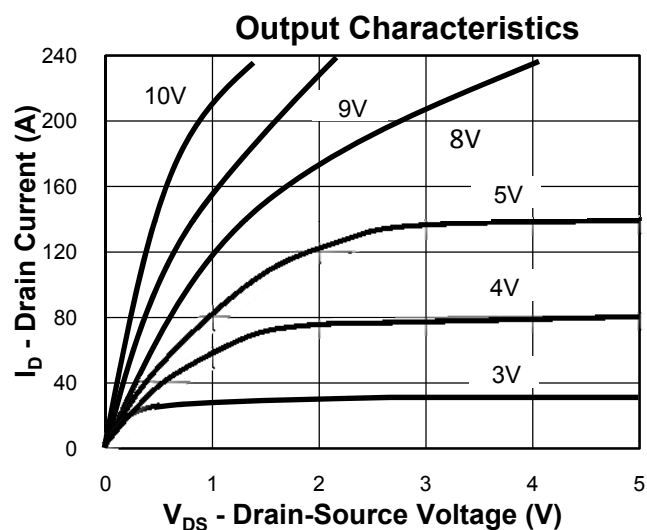
Typical Characteristics



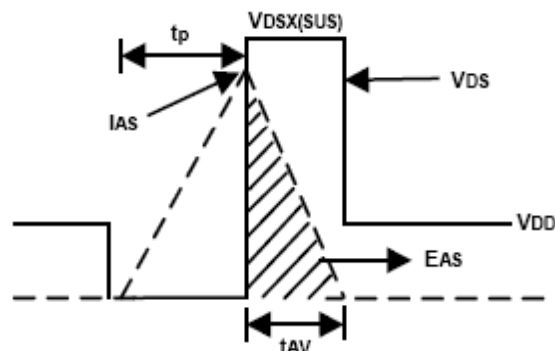
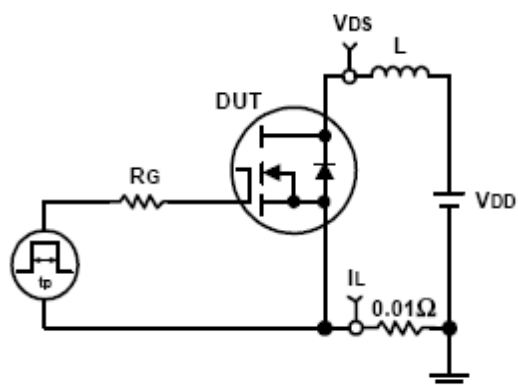
Thermal Transient Impedance



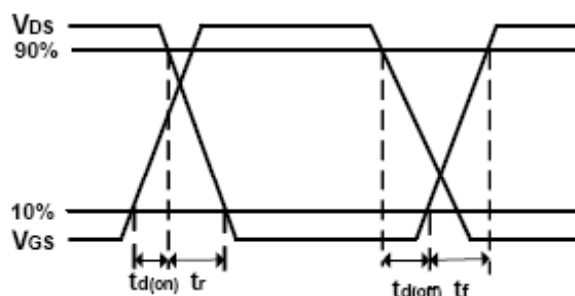
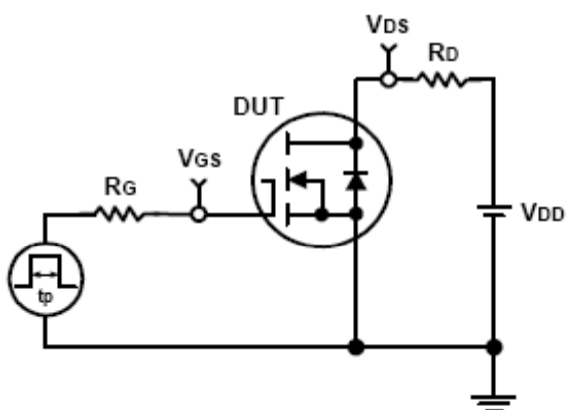
Typical Characteristics



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

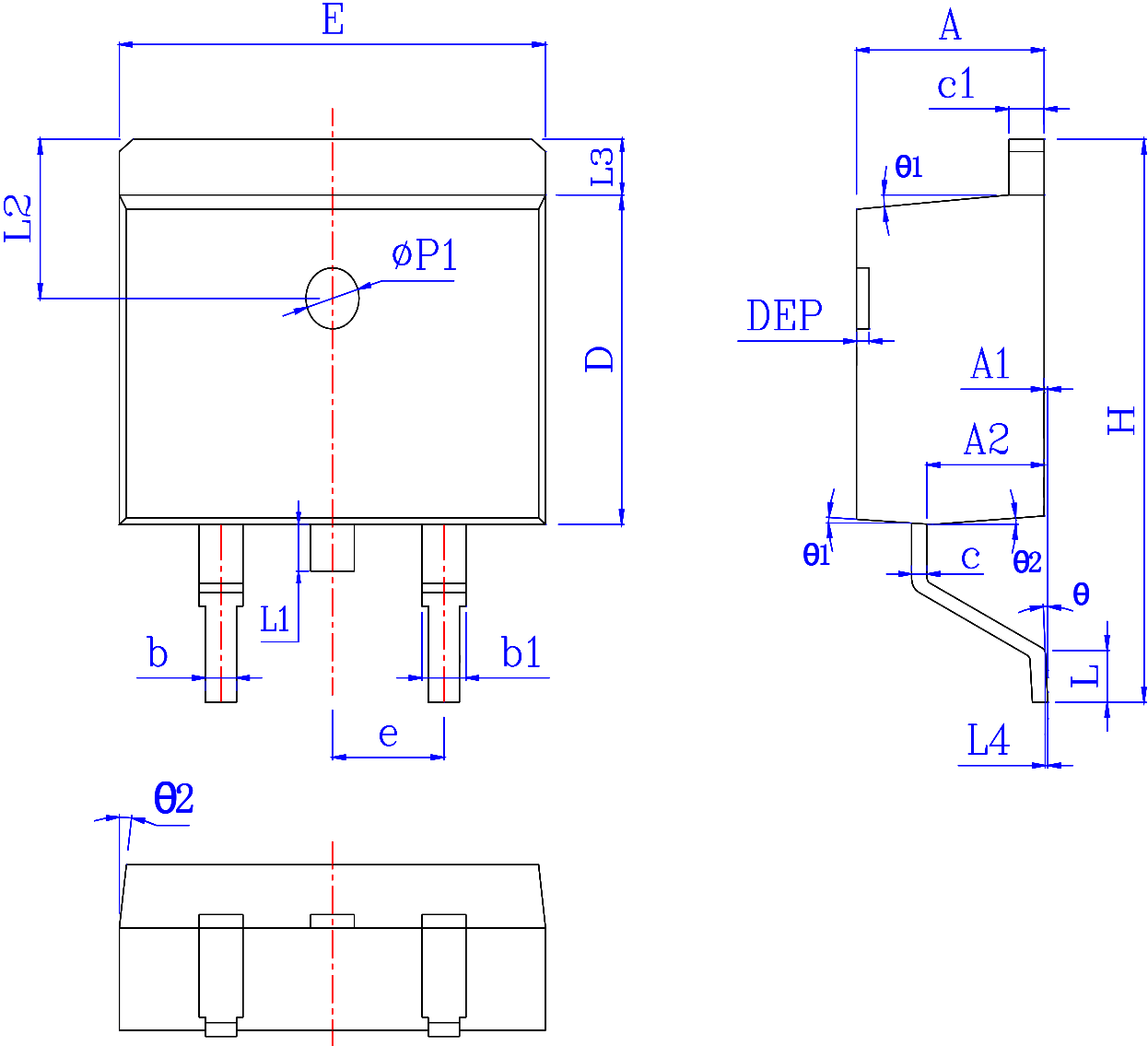


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RUH85120S	RUH85120S	TO263	Tube	50	-	-
RUH85120S-R	RUH85120S	TO263	Tape&Reel	800	13"	24mm

Package Information

TO263



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.30	4.55	4.85	0.169	0.179	0.191	L	1.85	2.30	2.79	0.073	0.091	0.110
A1	0.00	0.10	0.25	0.000	0.005	0.010	L3	1.02	1.29	1.40	0.040	0.051	0.055
A2	2.20	2.69	2.79	0.087	0.106	0.110	L1	*	*	1.70	*	*	0.067
b	0.70	*	1.00	0.028	*	0.039	L4	0.25 BSC			0.01 BSC		
b1	1.14	*	1.47	0.045	*	0.058	L2	2.50 REF			0.098 REF		
c	0.33	*	0.65	0.013	*	0.026	θ	0°	*	8°	0°	*	8°
c1	1.15	*	1.45	0.045	*	0.057	$\theta1$	5°	7°	9°	5°	7°	9°
D	8.59	*	9.40	0.338	*	0.370	$\theta2$	1°	3°	5°	1°	3°	5°
E	9.66	*	10.40	0.380	*	0.409	DEP	0.05	0.10	0.20	0.002	0.004	0.008
e	2.54BSC			0.100BSC			$\Phi p1$	1.40	1.50	1.60	0.055	0.059	0.063
H	14.70	15.10	15.79	0.579	0.594	0.622							