RU30120L

N-Channel Advanced Power MOSFET

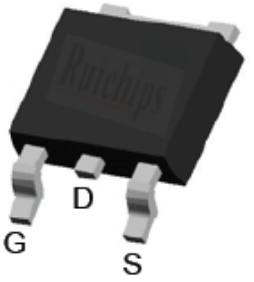
Features

- 30V/120A,
  $R_{DS(ON)}$ =2.5mΩ (Typ.) @ V_{GS}=10V
  $R_{DS(ON)}$ =3.3mΩ (Typ.) @ V_{GS}=4.5V
- Super High Dense Cell Design
- Ultra Low On-Resistance
- 100% avalanche tested
- Lead Free and Green Devices Available (RoHS Compliant)

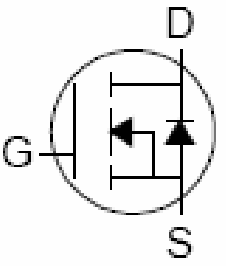
Applications

- DC-DC Converters

Pin Description



TO252



N-Channel MOSFET

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	
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	120①	A
Mounted on Large Heat Sink				
I_{DP}	300μs Pulse Drain Current Tested	T_C=25°C	480②	A
I_D	Continuous Drain Current	T_C=25°C	120①	A
		T_C=100°C	92	
P_D	Maximum Power Dissipation	T_C=25°C	125	W
		T_C=100°C	63	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.2	°C/W
Drain-Source Avalanche Ratings				
E_{AS}③	Avalanche Energy, Single Pulsed		400	mJ

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Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

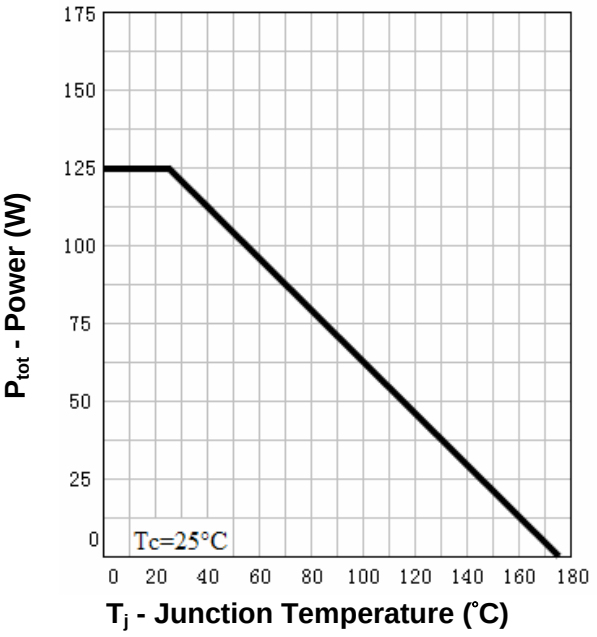
Symbol	Parameter	Test Condition	RU30120L			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}= 30V, V_{GS}=0V			1	μA
		T_J=85°C			10	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1	2	3	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}=60A		2.5	4	mΩ
		V_{GS}= 4.5V, I_{DS}=48A		3.3	6	mΩ
Diode Characteristics						
V_{SD} ④	Diode Forward Voltage	I_{SD}=60A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=60A, dI_{SD}/dt=100A/μs		45		ns
Q_{rr}	Reverse Recovery Charge			90		nC
Dynamic Characteristics ⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.8		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}= 15V, Frequency=1.0MHz		3170		pF
C_{oss}	Output Capacitance			480		
C_{rss}	Reverse Transfer Capacitance			265		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=0.3Ω, I_{DS}=60A, V_{GEN}= 10V, R_G=4.7Ω		25		ns
t_r	Turn-on Rise Time			106		
$t_{d(OFF)}$	Turn-off Delay Time			64		
t_f	Turn-off Fall Time			36		
Gate Charge Characteristics ⑤						
Q_g	Total Gate Charge	V_{DS}=24V, V_{GS}= 10V, I_{DS}=60A		65		nC
Q_{gs}	Gate-Source Charge			15		
Q_{gd}	Gate-Drain Charge			20		

Notes: ①Calculated continuous current based on maximum allowable junction temperature. Limited by bonding wire.The package limitation is 60A.
②Pulse width limited by safe operating area.
③Limited by T_{Jmax}, I_{AS} =40A, V_{DD} = 24V, R_G = 50Ω , Starting T_J = 25°C.
④Pulse test ; Pulse width≤300μs, duty cycle≤2%.
⑤Guaranteed by design, not subject to production testing.

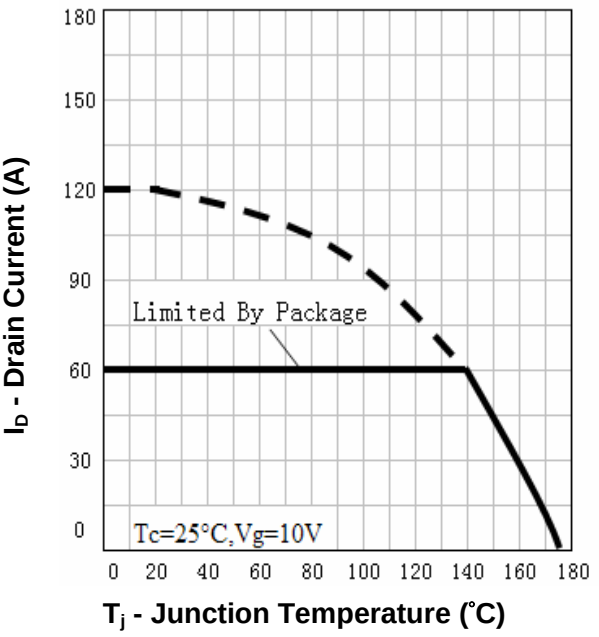
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Typical Characteristics

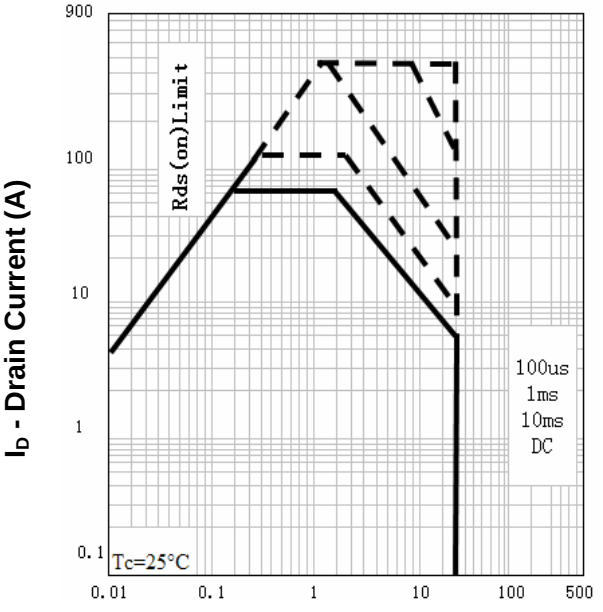
Power Dissipation



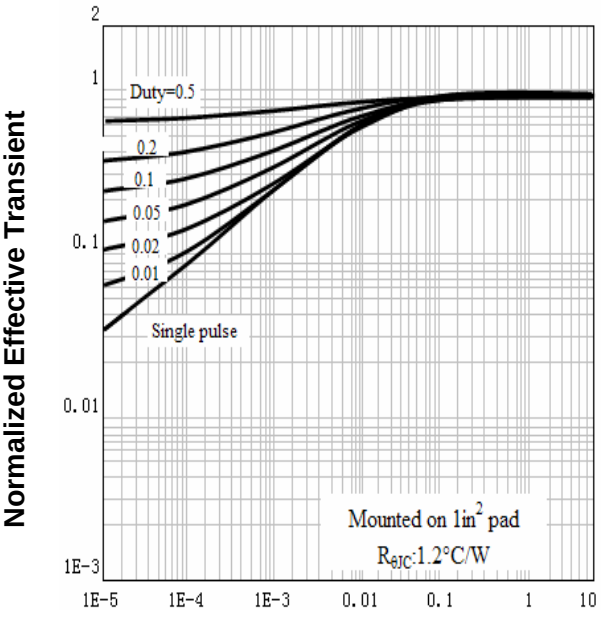
Drain Current



Safe Operation Area

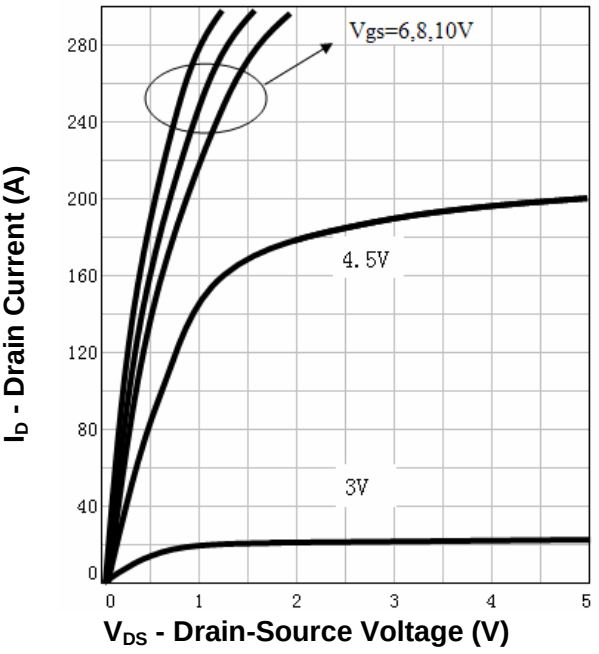


Thermal Transient Impedance

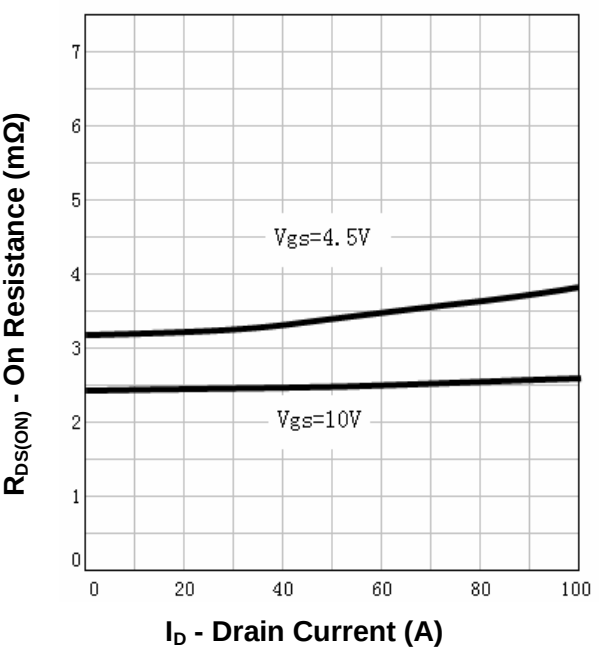


Typical Characteristics

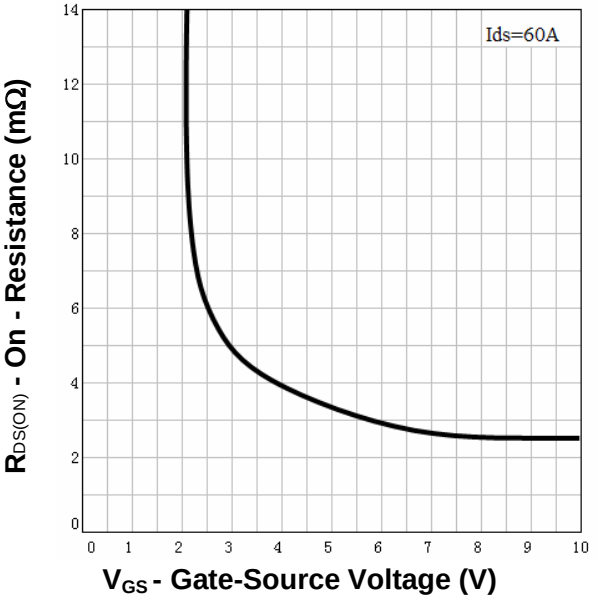
Output Characteristics



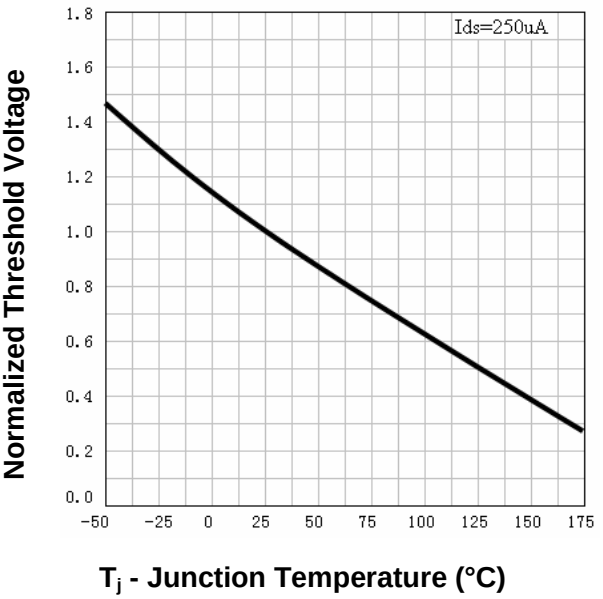
Drain-Source On Resistance



Drain-Source On Resistance

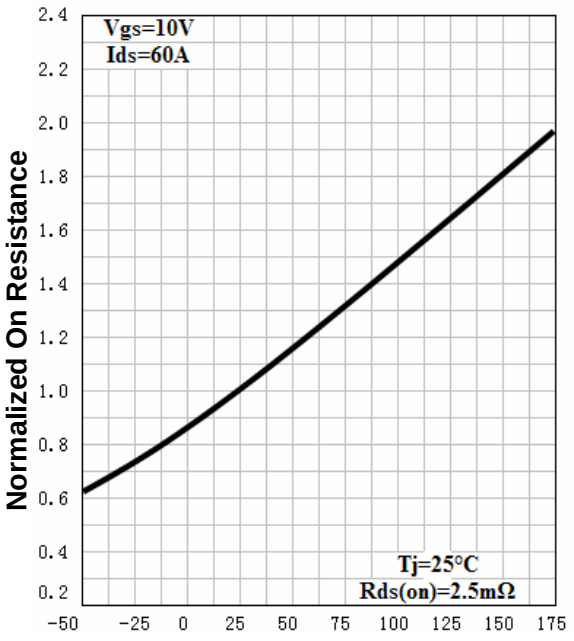


Gate Threshold Voltage



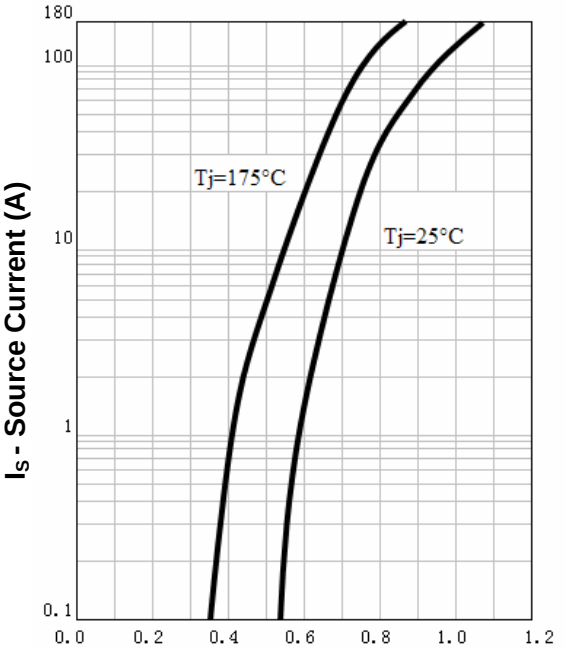
Typical Characteristics

Drain-Source On Resistance



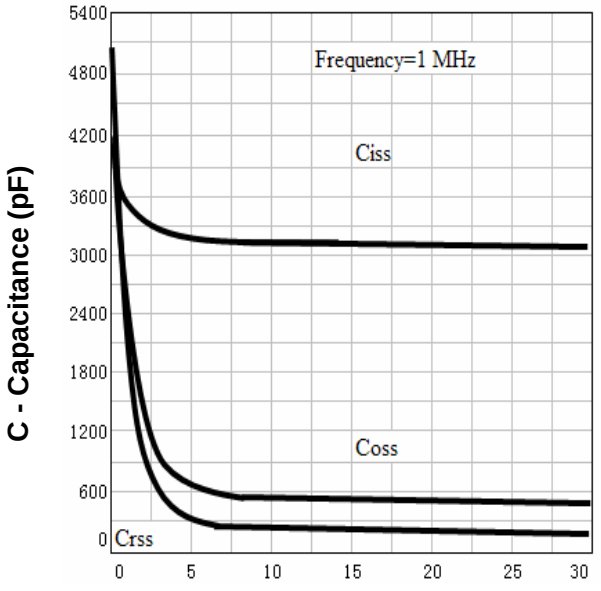
T_j - Junction Temperature (°C)

Source-Drain Diode Forward



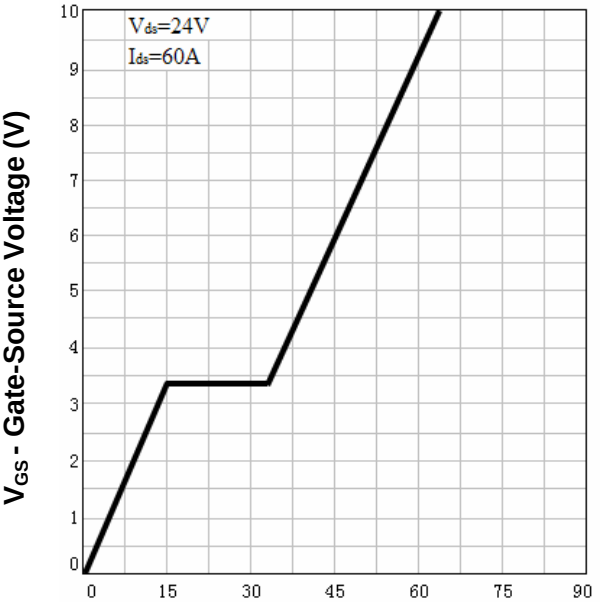
V_{SD} - Source-Drain Voltage (V)

Capacitance



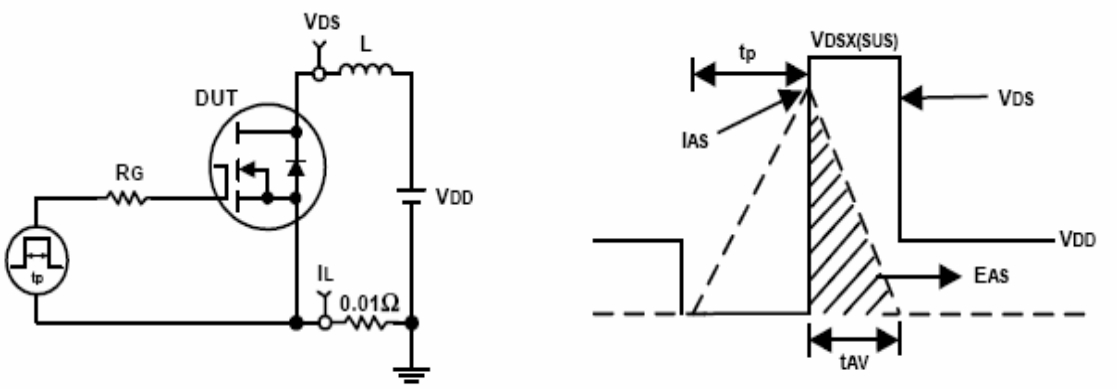
V_{DS} - Drain-Source Voltage (V)

Gate Charge

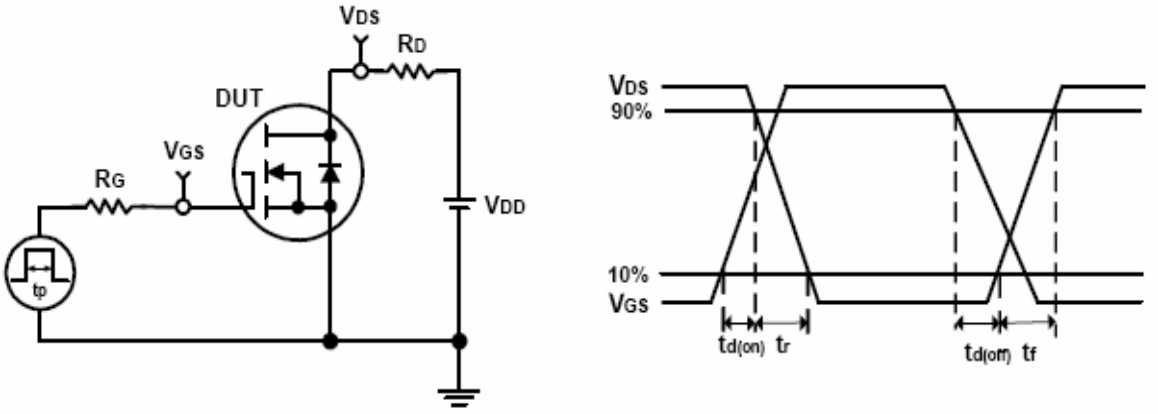


Q_G - Gate Charge (nC)

Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Ordering and Marking Information

RU30120

Package (Available)

L : TO252

Operating Temperature Range

C : -55 to 175 ºC

Assembly Material

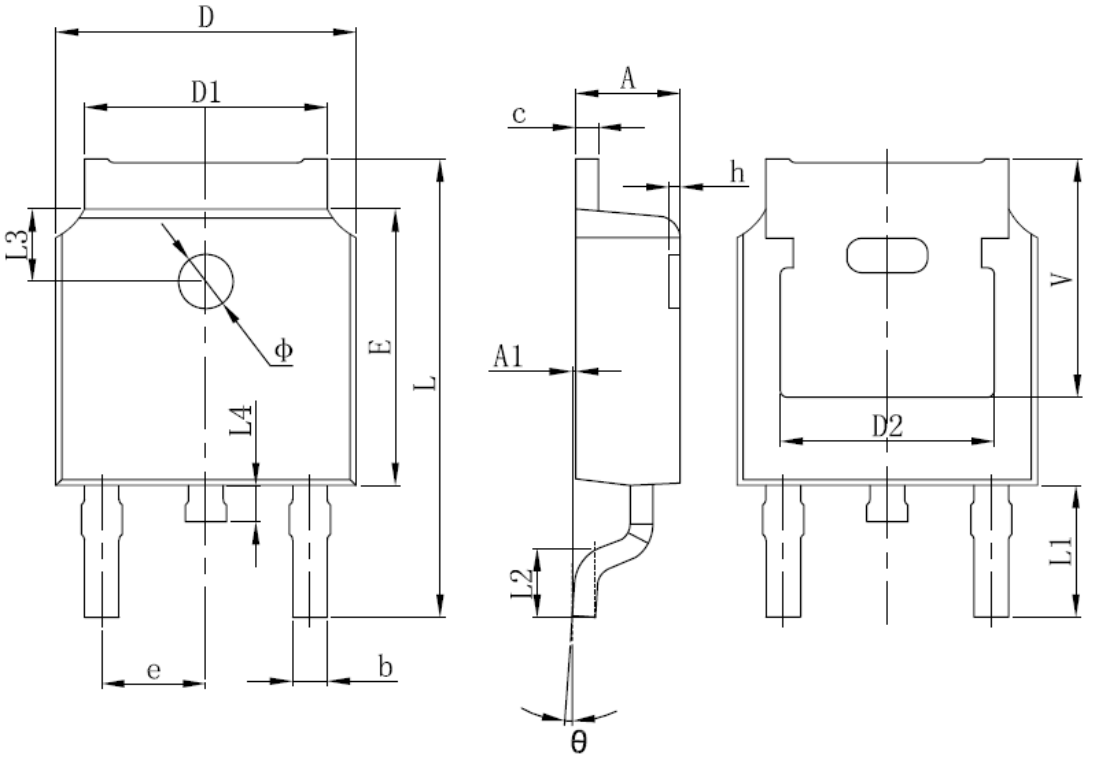
G : Green & Lead Free

Packaging

T : TUBE

Package Information

TO252-2L



SYMBOL	MM		INCH		SYMBOL	MM		INCH	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	2.200	2.400	0.087	0.094	L	9.800	10.400	0.386	0.409
A1	0.000	0.127	0.000	0.005	L1	2.900 REF.		0.114 REF.	
b	0.660	0.860	0.026	0.034	L2	1.400	1.700	0.055	0.067
C	0.460	0.580	0.018	0.023	L3	1.600 REF.		0.063REF.	
D	6.500	6.700	0.256	0.264	L4	0.600	1.000	0.024	0.039
D1	5.100	5.460	0.201	0.215	Φ	1.100	1.300	0.043	0.051
D2	4.830 REF.		0.190 REF.		θ	0°	8°	0°	8°
E	6.000	6.200	0.236	0.244	h	0.000	0.300	0.000	0.012
e	2.186	2.386	0.086	0.094	V	5.350 REF.		0.211 REF.	

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

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Technical Support:
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Investor Relations Contacts:
Investor@ruichips.com

Marcom Contact:
Marcom@ruichips.com

Editorial Contact:
Editorial@ruichips.com

HR Contact:
HR@ruichips.com

Legal Contact:
Legal@ruichips.com

Shen Zhen RUICHIPS Semiconductor CO., LTD
Room 501, the 5floor An Tong Industrial Building,
NO.207 Mei Hua Road Fu Tian Area Shen Zhen City, CHINA

TEL: (86-755) 8311-5334
FAX: (86-755) 8311-4278
E-mail: Sales-SZ@ruichips.com