

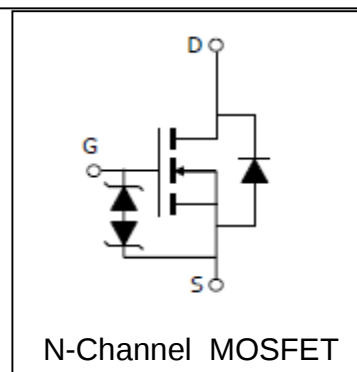
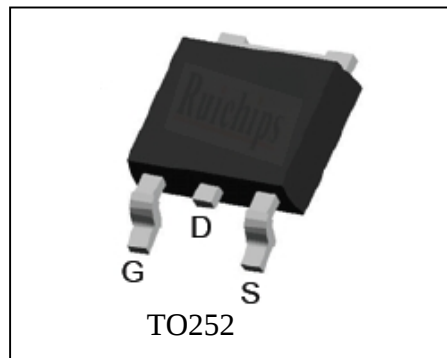
Features

- 40V/25A,
 $R_{DS(ON)} = 26m\Omega(\text{tpy.}) @ V_{GS} = 10V$
 $R_{DS(ON)} = 38m\Omega(\text{tpy.}) @ V_{GS} = 4.5V$
- Super High Dense Cell Design
- ESD protected
- Reliable and Rugged
- 100% avalanche tested
- Lead Free and Green Devices Available
 (RoHS Compliant)

Applications

- Power Management.

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		40	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	25	A
Mounted on Large Heat Sink				
I _{DP}	300μs Pulse Drain Current Tested	T _C =25°C	100 ^①	A
I _D	Continuous Drain Current(V _{GS} =10V)	T _C =25°C	25 ^②	A
		T _C =100°C	19	
P _D	Maximum Power Dissipation	T _C =25°C	40	W
		T _C =100°C	20	
R _{θJC}	Thermal Resistance-Junction to Case		3.75	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^③	Avalanche Energy, Single Pulsed		40	mJ

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

Symbol	Parameter	Test Condition	RU40E25L			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 40V, V _{GS} =0V			1	μA
		T _J =85°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.5	2	2.7	V
I _{GSS}	Gate Leakage Current	V _{GS} =±16V, V _{DS} =0V			±10	μA
R _{DS(ON)} ④	Drain-Source On-state Resistance	V _{GS} = 10V, I _{DS} =12A		26	40	mΩ
		V _{GS} = 4.5V, I _{DS} =8A		38	60	mΩ
Diode Characteristics						
V _{SD} ④	Diode Forward Voltage	I _{SD} =12A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =12A, dI _{SD} /dt=100A/μs		40		ns
Q _{rr}	Reverse Recovery Charge			65		nC
Dynamic Characteristics ⑤						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.3		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} = 20V, Frequency=1.0MHz		485		pF
C _{oss}	Output Capacitance			65		
C _{rss}	Reverse Transfer Capacitance			35		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =1.8Ω, I _{DS} =12A, V _{GEN} = 10V, R _G =6Ω		13		ns
t _r	Turn-on Rise Time			18		
t _{d(OFF)}	Turn-off Delay Time			32		
t _f	Turn-off Fall Time			15		
Gate Charge Characteristics ⑤						
Q _g	Total Gate Charge	V _{DS} =32V, V _{GS} = 10V, I _{DS} =12A		18		nC
Q _{gs}	Gate-Source Charge			4		
Q _{gd}	Gate-Drain Charge			6		

Notes: ① Pulse width limited by safe operating area.

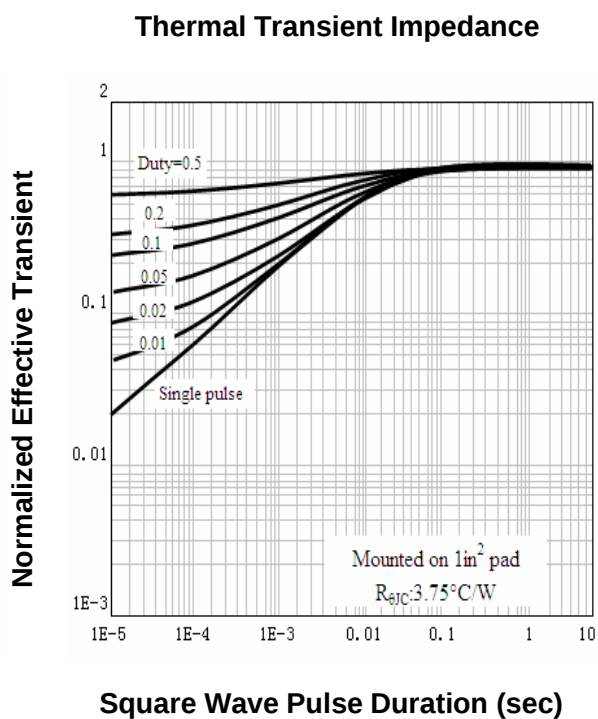
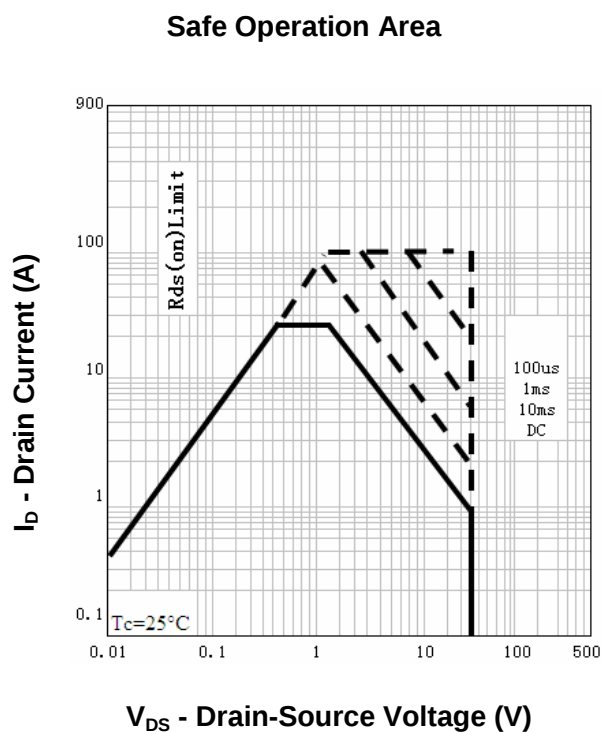
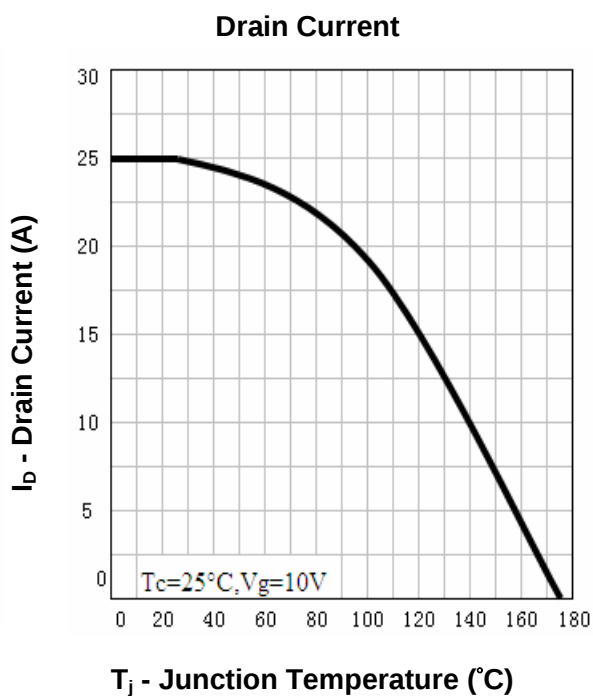
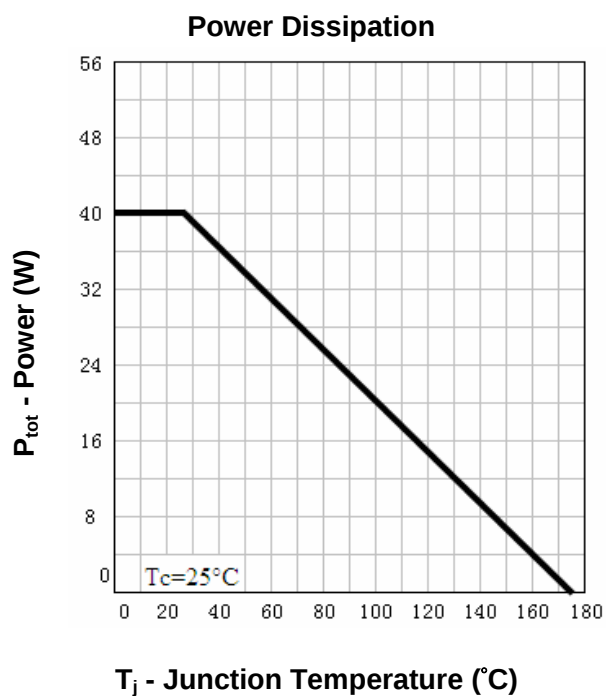
② Calculated continuous current based on maximum allowable junction temperature. Current limited by bond wire.

③ Limited by T_{Jmax} , $I_{AS}=9A$, $V_{DD}=30V$, $R_G=50\Omega$, Starting $T_J=25^{\circ}\text{C}$.

④ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

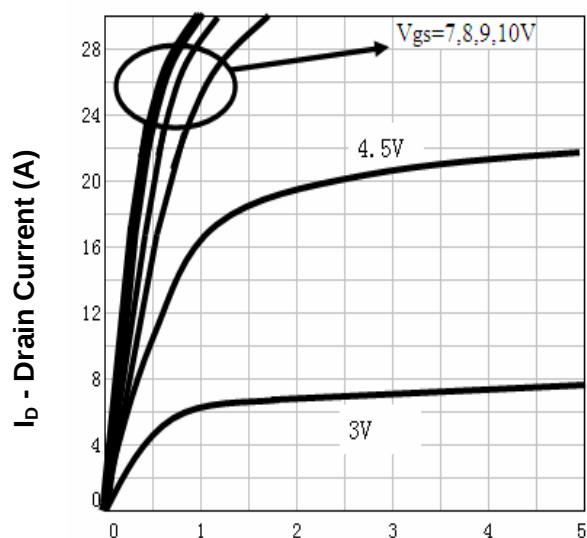
⑤ Guaranteed by design, not subject to production testing.

Typical Characteristics



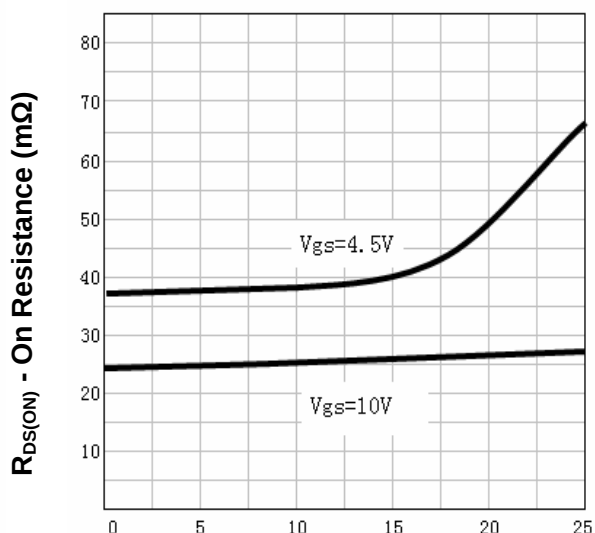
Typical Characteristics

Output Characteristics



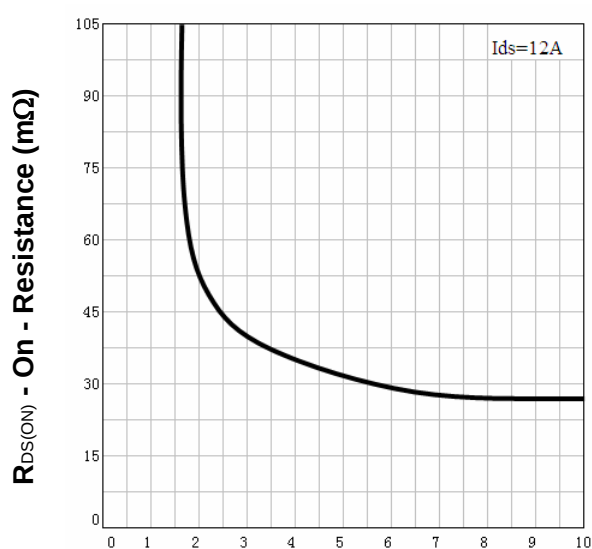
V_{DS} - Drain-Source Voltage (V)

Drain-Source On Resistance



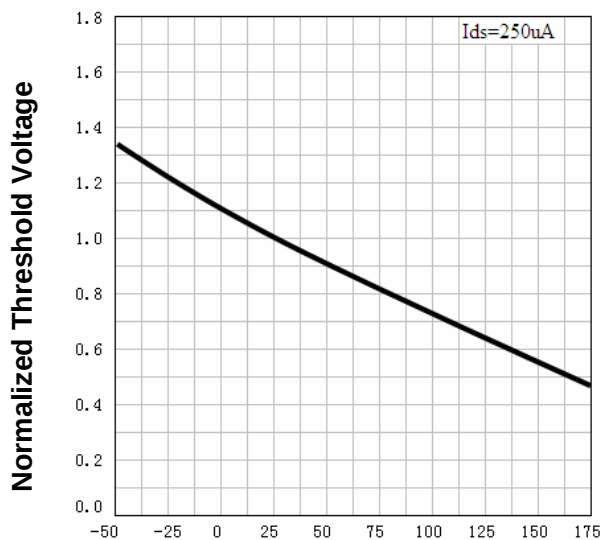
I_D - Drain Current (A)

Drain-Source On Resistance



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

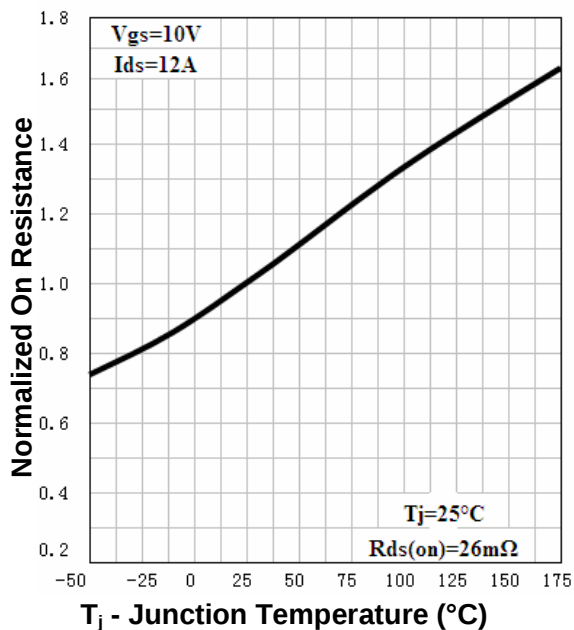
Gate Threshold Voltage



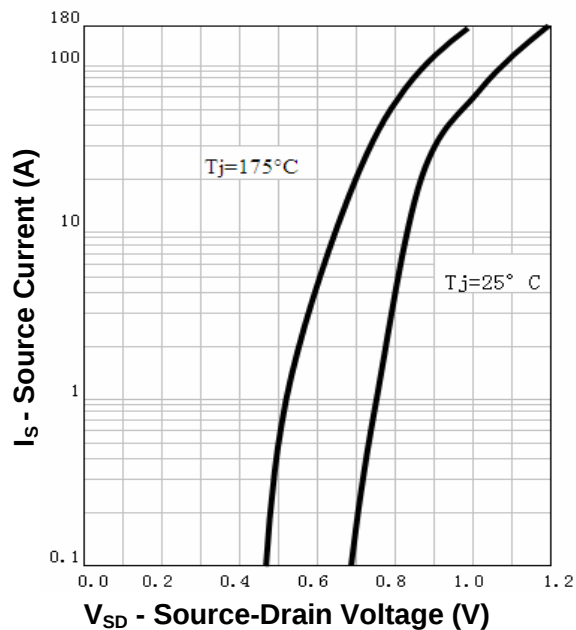
T_j - Junction Temperature ($^{\circ}C$)

Typical Characteristics

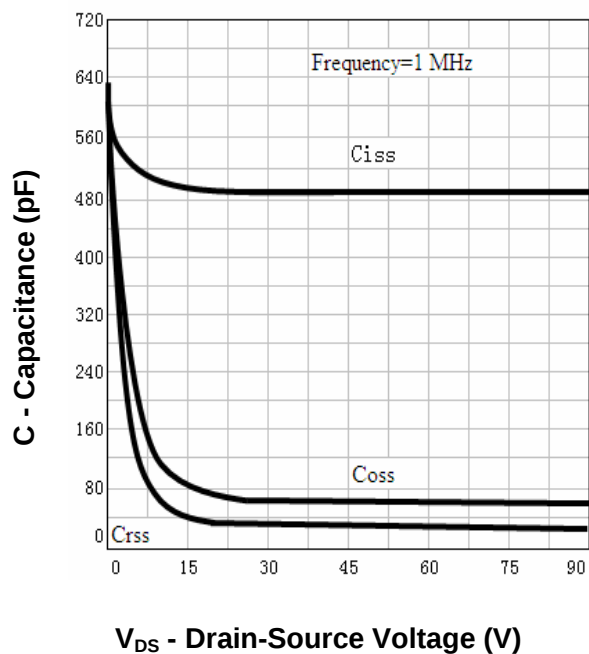
Drain-Source On Resistance



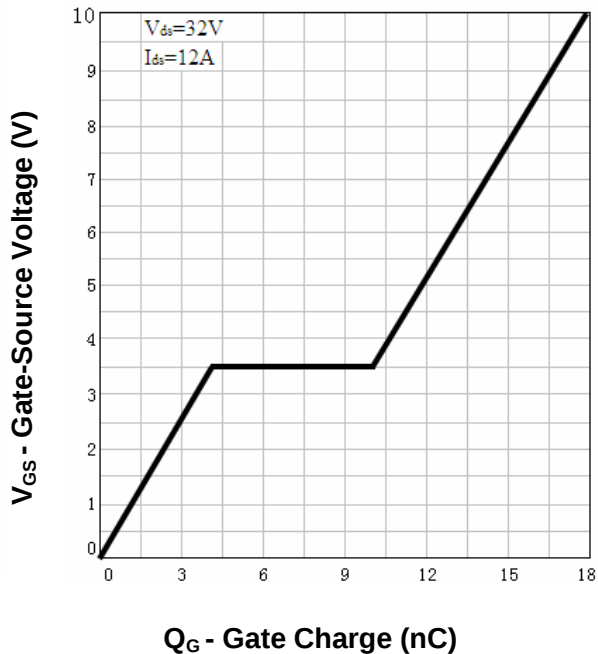
Source-Drain Diode Forward



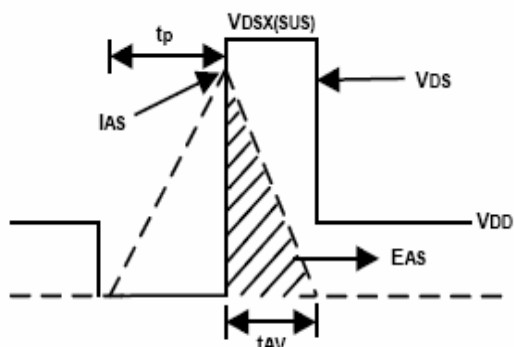
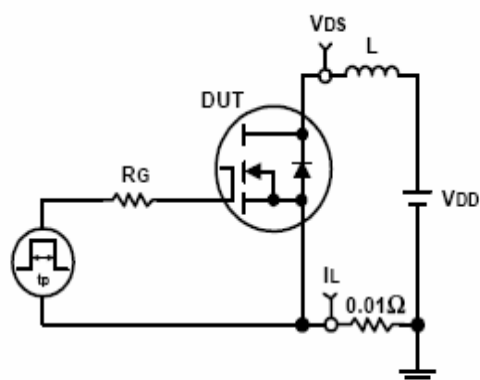
Capacitance



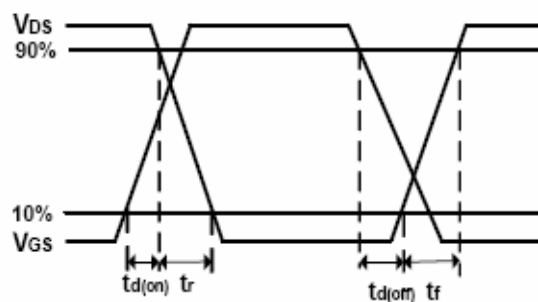
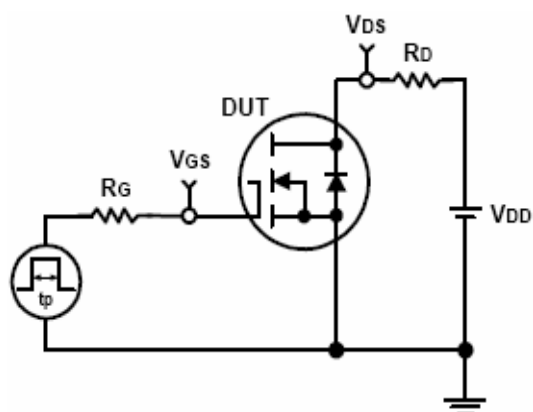
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Ordering and Marking Information

RU40E25

Package (Available)

L : TO252

Operating Temperature Range

C : -55 to 175 °C

Assembly Material

G : Green & Lead Free

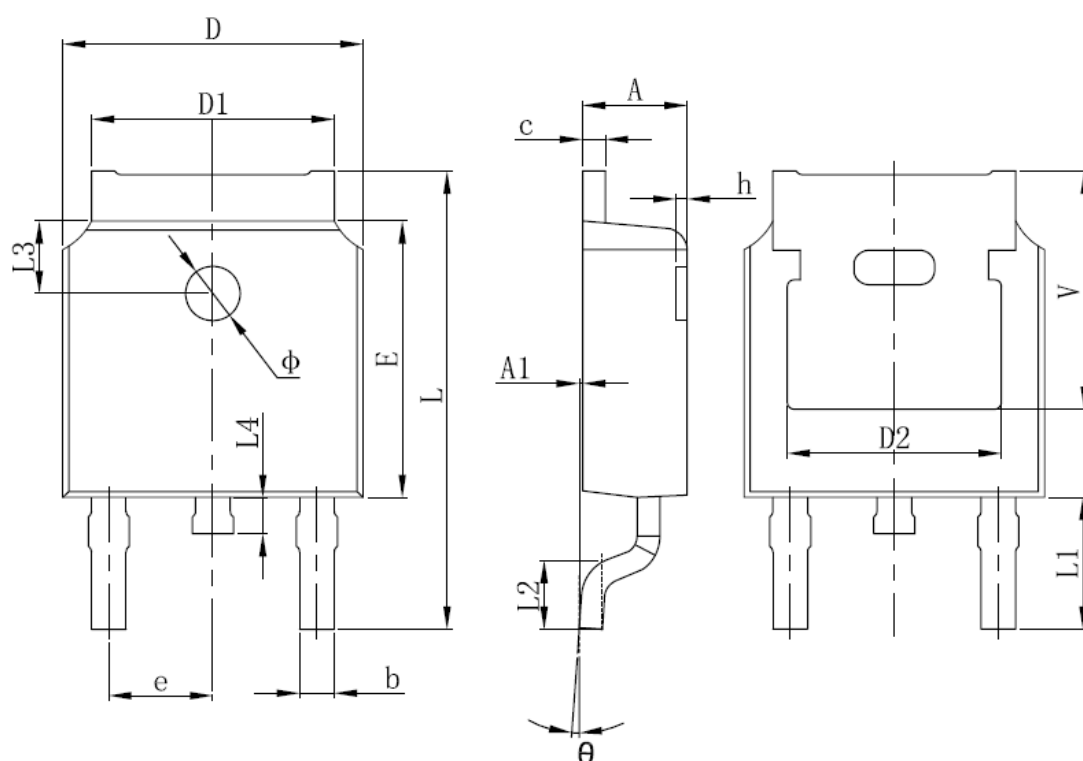
Packaging

T : TUBE

TR : Tape & Reel

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.		0.063 REF.	
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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