

General Description

The UV80N03L uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.

This device is suitable for use in PWM, load switching and general purpose applications.

Features

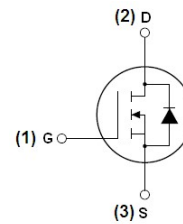
Enhancement Mode

Very low on-resistance $R_{DS(on)}$ @ $V_{GS}=4.5V$

100% Avalanche Tested



TO-252-2L Top view



Schematic diagram

V_{DS}	30	V
$R_{DS(on) TYP@V_{GS}=10V}$	4.5	m Ω
$R_{DS(on) TYP@V_{GS}=4.5V}$	7	m Ω
I_D	80	A

Applications

Power switching application

Hard Switched and High Frequency Circuits

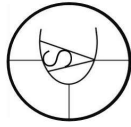
Uninterruptible Power Supply

Package Marking And Ordering Information

Part ID	Package Type	Marking	Tape and Reel information
UV80N03L	TO-252-2L	UV80N03L	2500pcs/REEL

Maximum ratings, at $T_j=25^\circ C$, unless otherwise specified

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain –Source breakdown voltage	30	V
I_S	Diode continuous forward current	$T_c=25^\circ C$ 80	A
I_D	Continuous drain current @ $V_{GS}=10V$	$T_c=25^\circ C$ 80	A
I_{DM}	Pulse drain current tested①	$T_c=25^\circ C$ 180	A
E_{AS}	Avalanche energy, single pulsed②	260	mJ
P_D	Maximum power dissipation	$T_c=25^\circ C$ 60	W
V_{GS}	Gate-Source voltage	± 20	V
$T_{STG} T_J$	Storage and operating temperature range	-55 to 175	$^\circ C$



Thermal Characteristic

Symbol	Parameter	Typical	Unit
R_{QJC}	Thermal Resistance-Junction to Case	1.3	$^{\circ}\text{C}/\text{W}$
R_{QJA}	Thermal Resistance-Junction to Ambient	62.5	$^{\circ}\text{C}/\text{W}$

Typical Characteristics

Symbol	Parameter	Condition	Min	Type	Max	Unit
Static Electrical Characteristics @$T_j=25^{\circ}\text{C}$ (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=24\text{V}, V_{GS}=0\text{V}$			1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$			± 100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1		2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ^③	$V_{GS}=10\text{V}, I_D=20\text{A}$		4.5	6	$\text{m}\Omega$
$R_{DS(ON)}$	Drain-Source On-State Resistance ^③	$V_{GS}=4.5\text{V}, I_D=10\text{A}$		7	9	$\text{m}\Omega$
Dynamic Electrical Characteristics @$T_j=25^{\circ}\text{C}$ (unless otherwise stated)						
C_{iss}	Input Capacitance	$V_{DS}=20\text{V},$		1500		PF
C_{oss}	Output Capacitance	$V_{GS}=0\text{V},$		280		PF
C_{rss}	Reverse Transfer Capacitance	$F=1\text{MHz}$		140		PF
Q_g	Total Gate Charge	$V_{DS}=24\text{V},$		16		nC
Q_{gs}	Gate-Source Charge	$I_D=8\text{A},$		5		nC
Q_{gd}	Gate-Drain Charge	$V_{GS}=10\text{V}$		8		nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay time	$V_{DD}=24\text{V}$		25.7		nS
t_r	Turn-on Rise time	$I_D=8\text{A}$		10		nS
$t_{d(off)}$	Turn-off Delay time	$R_G=3\Omega$		128		nS
t_f	Turn-off Fall time	$V_{GS}=10\text{V}$		34		nS
Source-Drain Diode Characteristics						
V_{SD}	Forward on voltage	$I_{SD}=40\text{A}, V_{GS}=0\text{V}$		0.8	1.2	V
t_{rr}	Reverse Recovery Time	$T_j=25^{\circ}\text{C}, I_{SD}=8\text{A}$		18		nS
Q_{rr}	Reverse Recovery Charge	$V_{GS}=0\text{V}, di/dt=200\text{A}/\mu\text{s}$		40		nC

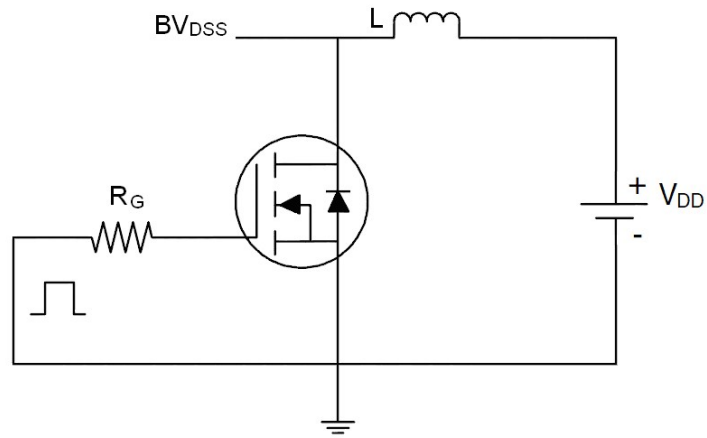
Note:

- ① Repetitive rating; pulse width limited by max, junction temperature.
- ② Limited by T_{jmax} , starting $T_j=25^{\circ}\text{C}$, $L=0.1\text{mH}$, $R_G=25\Omega$, $I_{AS}=8\text{A}$, $V_{GS}=10\text{V}$, Part not recommended for use above this value
- ③ Pulse width $\cong 300\mu\text{s}$; duty cycle $\cong 2\%$

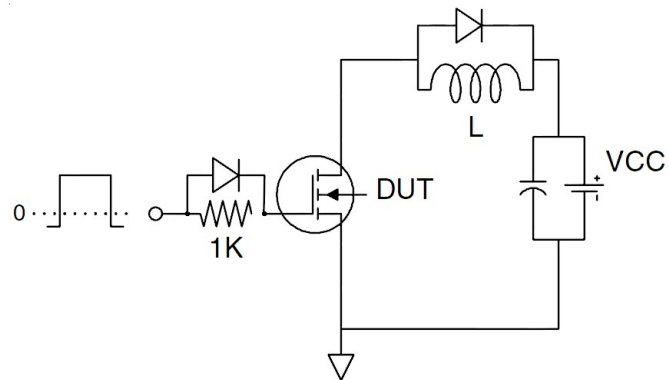


Test circuit

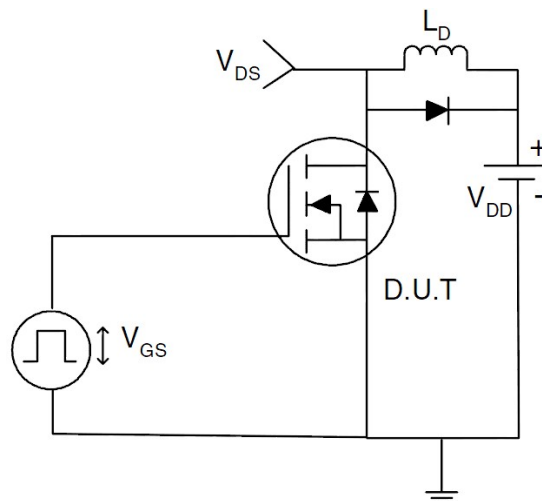
(1) E_{AS} test circuits

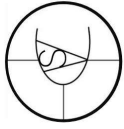


(2) Gate charge test circuit



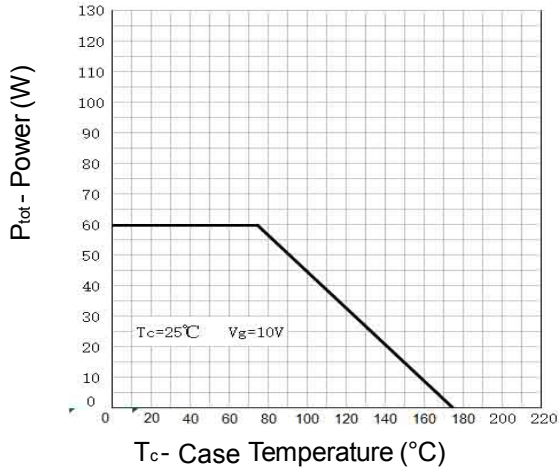
(3) Switch time test circuit



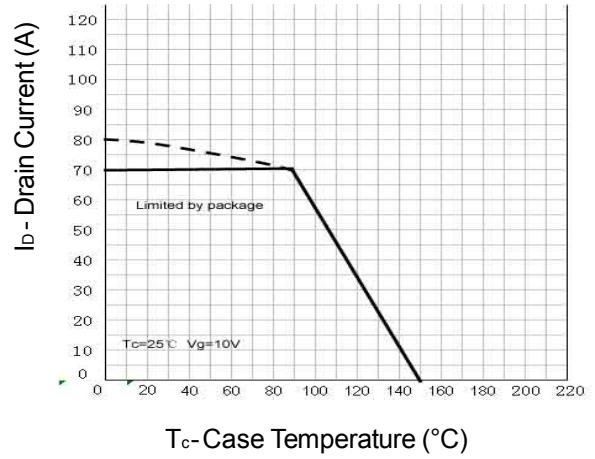


Typical Operating Characteristics

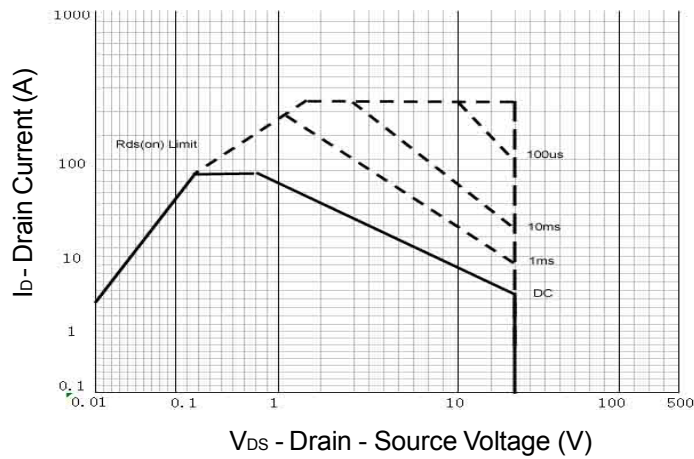
Power Dissipation



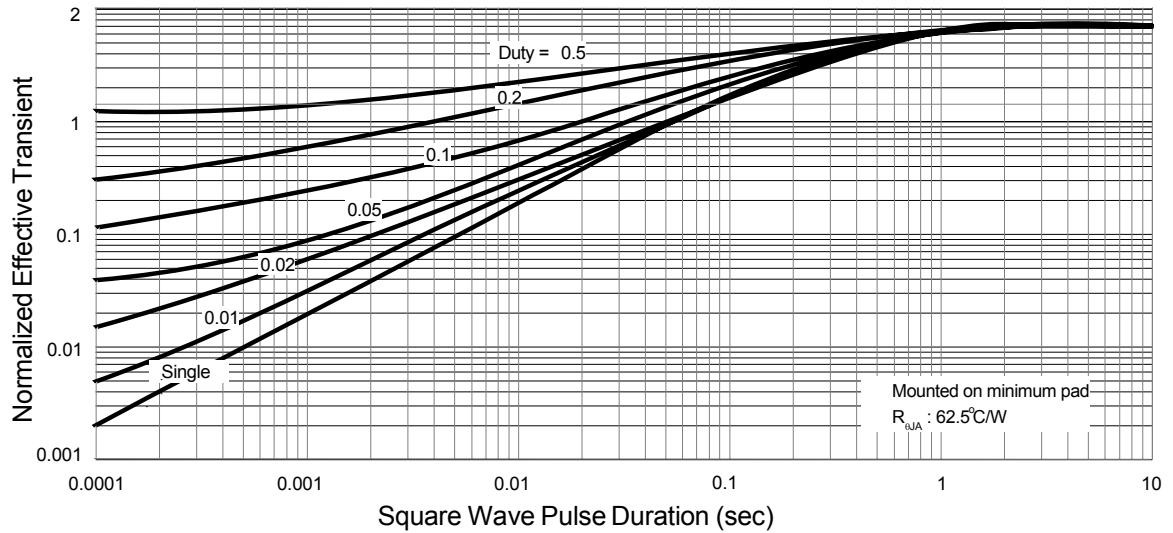
Drain Current



Safe Operation Area



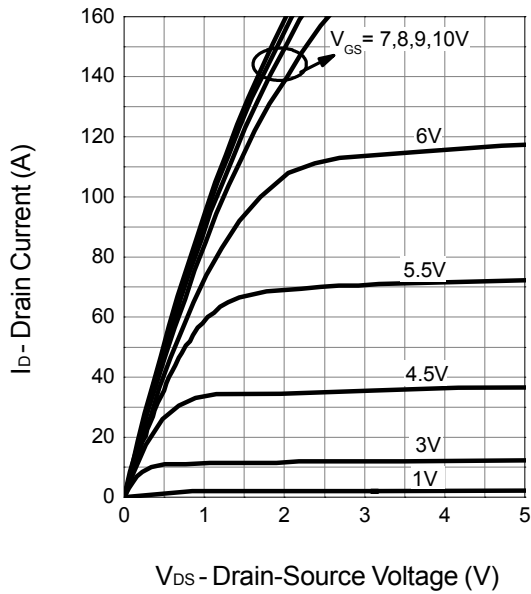
Thermal Transient Impedance



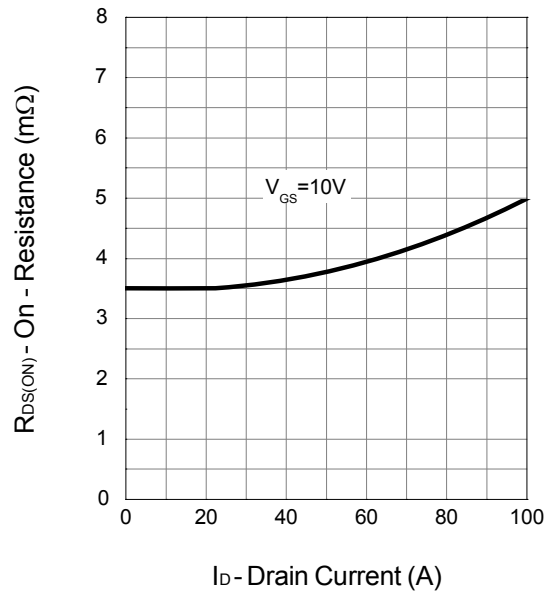


Typical Operating Characteristics (Cont.)

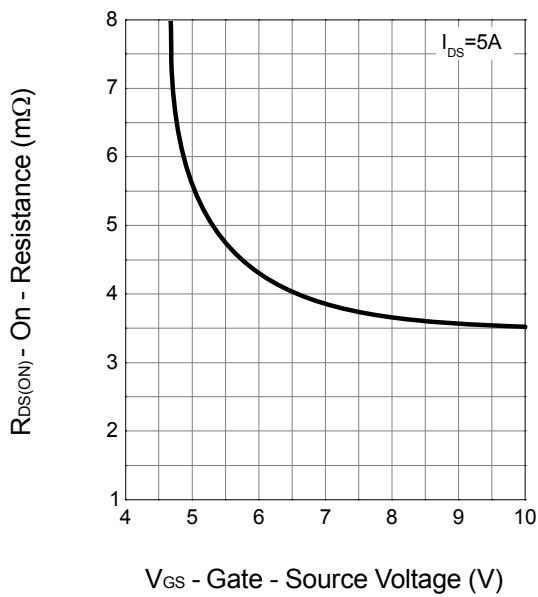
Output Characteristics



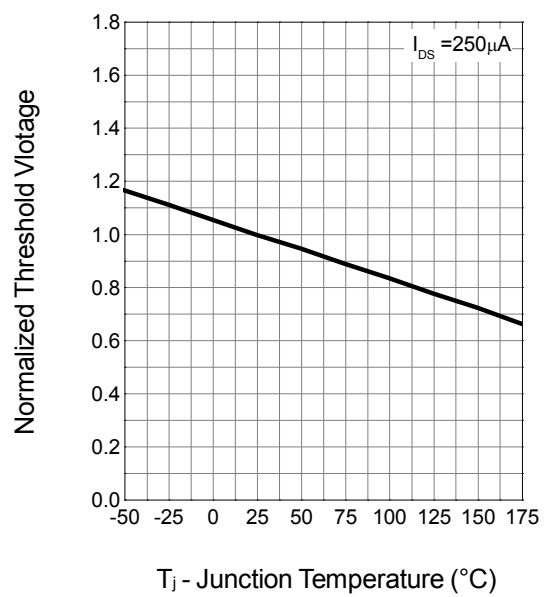
Drain-Source On Resistance



Drain-Source On Resistance



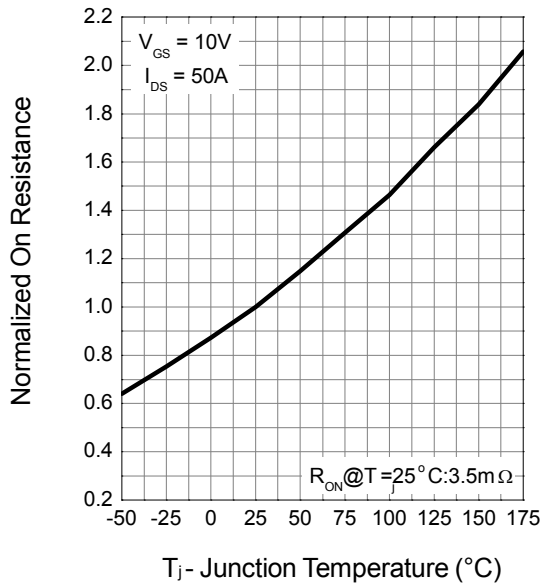
Gate Threshold Voltage



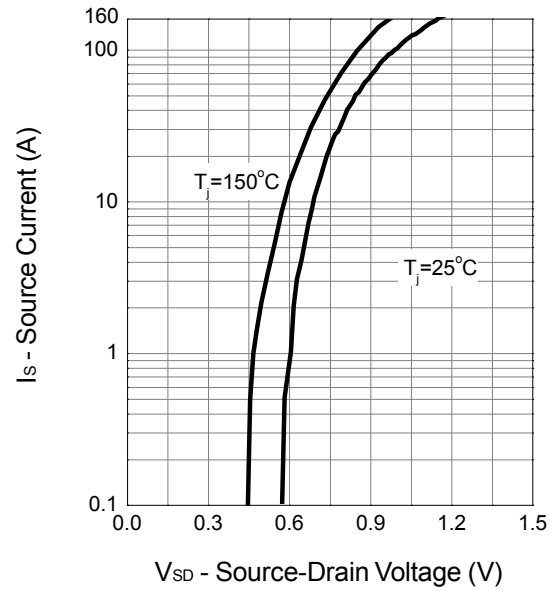


Typical Operating Characteristics (Cont.)

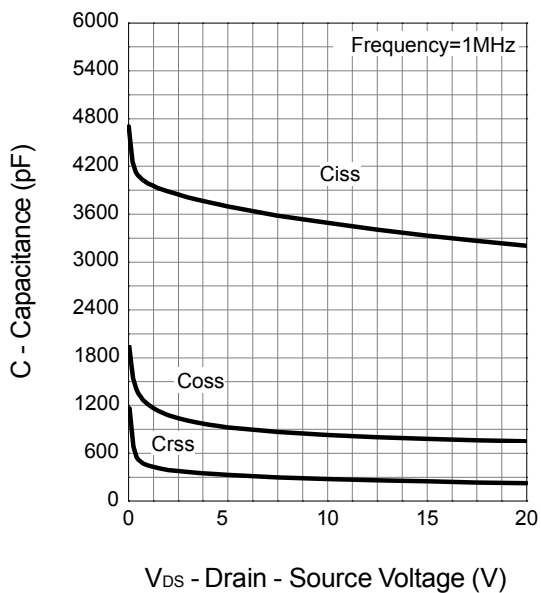
Drain-Source On Resistance



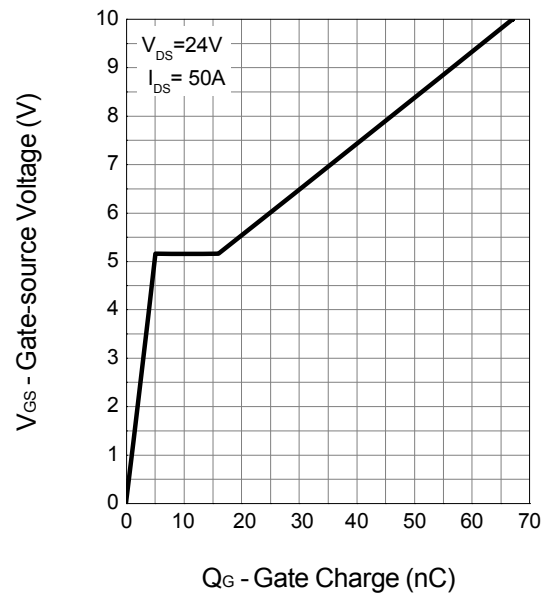
Source-Drain Diode Forward



Capacitance



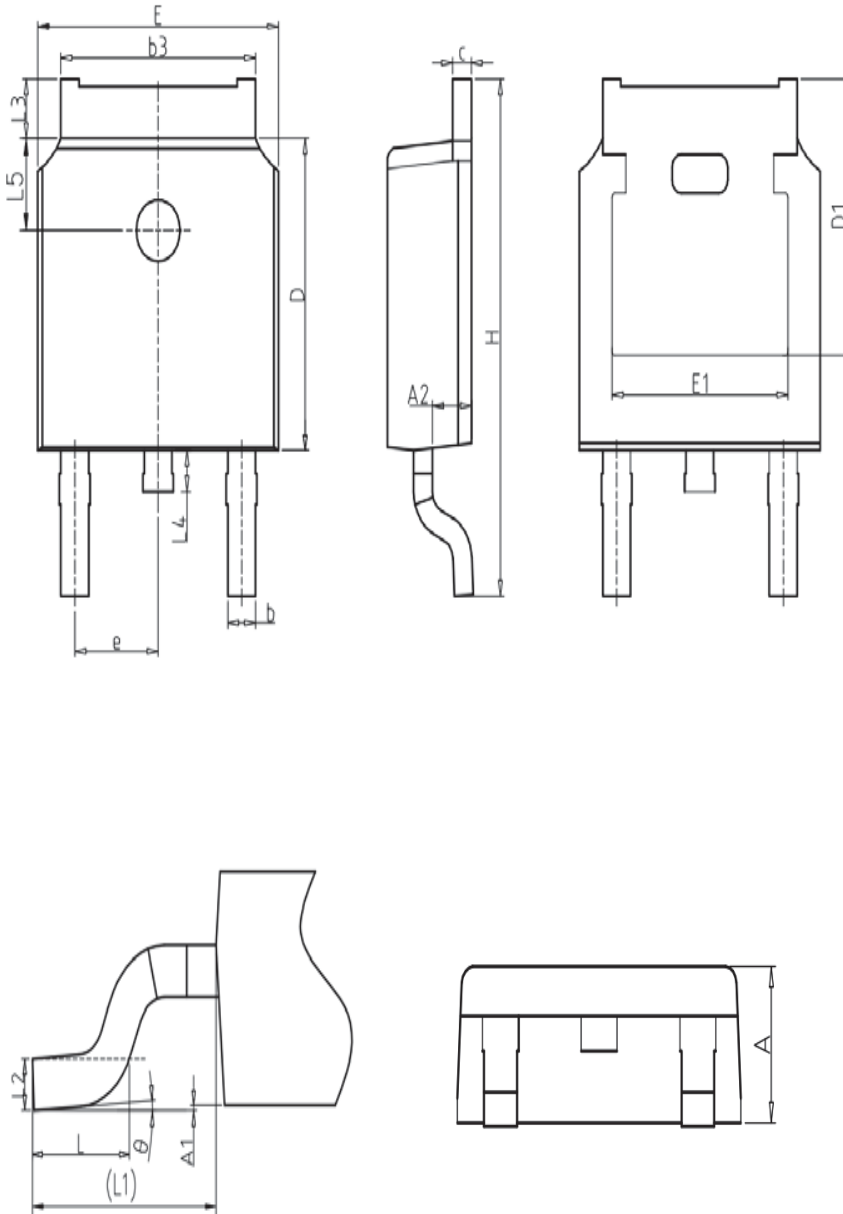
Gate Charge





Package Information

TO-252-2L

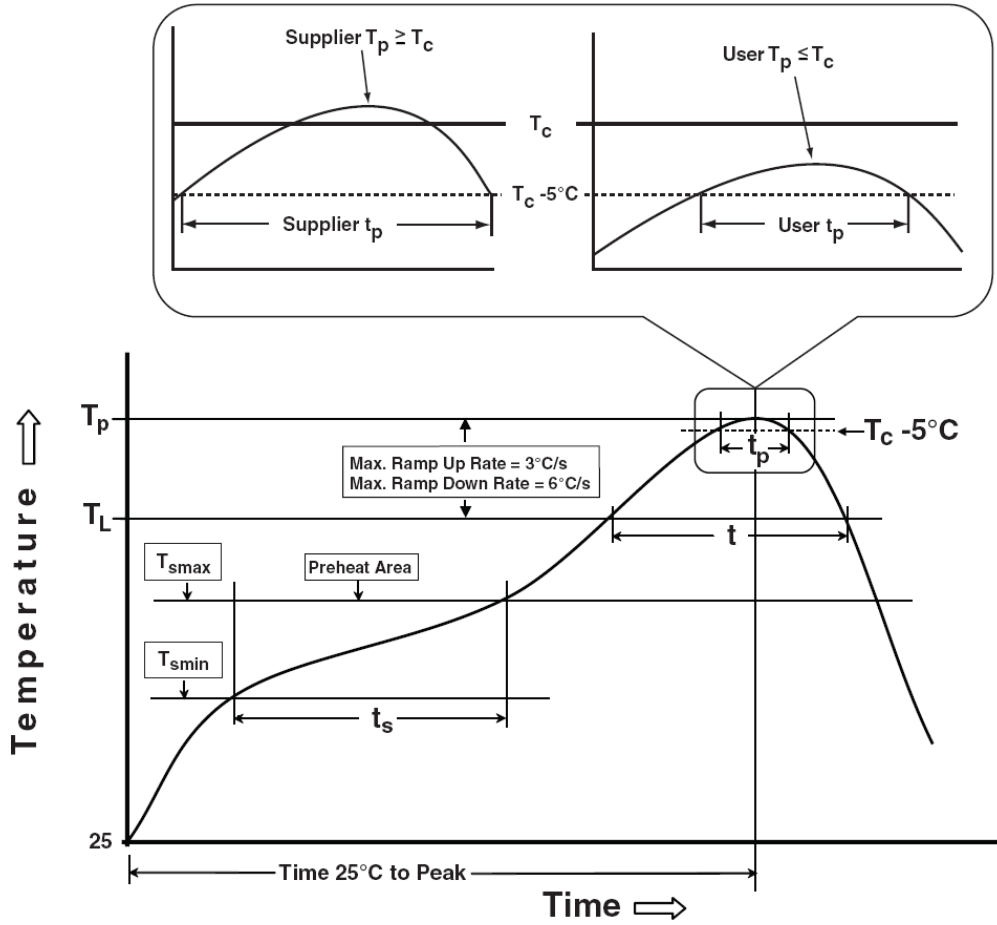


COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.00	-	0.20
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.286BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88	-	1.28
L4	-	-	1.00
L5	1.65	1.80	1.95
θ	0°	-	8°



Classification Profile





Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak		
Temperature min (T_{smin})	100 °C	150 °C
Temperature max (T_{smax})	150 °C	200 °C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max.	3°C/second max.
Liquidous temperature (T_L)	183 °C	217 °C
Time at liquidous (t_L)	60-150 seconds	60-150 seconds
Peak package body Temperature (T_p)*	See Classification Temp in table 1	See Classification Temp in table 2
Time (t_p)** within 5°C of the specified classification temperature (T_c)	20** seconds	30** seconds
Average ramp-down rate (T_p to T_{smax})	6 °C/second max.	6 °C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
* Tolerance for peak profile Temperature (T_p) is defined as a supplier minimum and a user maximum. ** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.		

Table 1. SnPb Eutectic Process – Classification Temperatures (T_c)

Package Thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2. Pb-free Process – Classification Temperatures (T_c)

Package Thickness	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm – 2.5 mm	260 °C	250 °C	245 °C
≥2.5 mm	250 °C	245 °C	245 °C

Reliability Test Program

Test item	Method	Description
SOLDERABILITY	JESD-22, B102	5 Sec, 245°C
HOLT	JESD-22, A108	168 Hrs /500 Hrs /1000 Hrs, Bias @ 150°C
PCT	JESD-22, A102	96 Hrs, 100%RH, 2atm, 121°C
TCT	JESD-22, A104	500 Cycles, -55°C~150°C

Customer Service

Worldwide Sale and Service: Kentyang2002@163.com

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