

## -30A, -100V P CHANNEL MOSFET

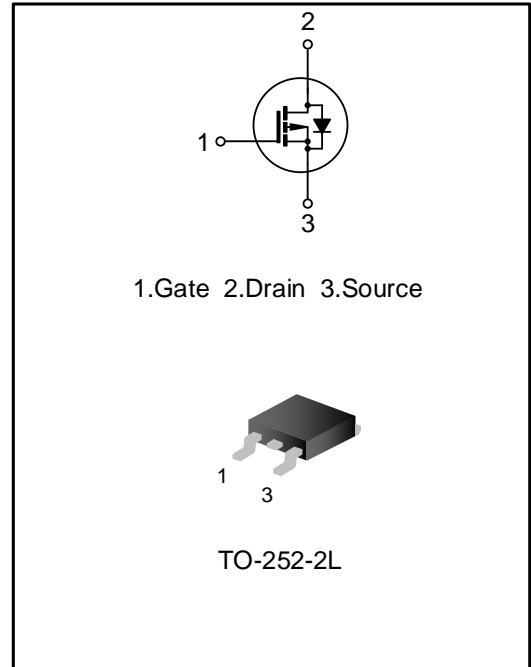
### DESCRIPTION

SVT10500PD is a P channel enhancement mode power MOS field effect transistor which is produced using Silan's LVMOS technology. The improved process and cell structure have been especially tailored to minimize on-state resistance, provide superior switching performance and high avalanche breakdown tolerance.

This device is widely used in UPS, Power Management for Inverter Systems.

### FEATURES

- ◆ -30A, -100V,  $R_{DS(on)(typ.)} = 35m\Omega @ V_{GS} = -10V$
- ◆ Low gate charge
- ◆ Low  $C_{rss}$
- ◆ Fast switching
- ◆ Improved dv/dt capability
- ◆ 100% avalanche tested
- ◆ Pb-free lead plating
- ◆ RoHS compliant



### KEY PERFORMANCE PARAMETERS

Characteristics	Ratings	Unit
$V_{DS}$	-100	V
$V_{GS(th)}$	-1.5~-2.5	V
$R_{DS(on),max}$	50	m $\Omega$
$I_D$	-30	A
$Q_{g,typ}$	80	nC

### ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVT10500PDTR	TO-252-2L	10500PD	Halogen free	Tape & Reel

**ABSOLUTE MAXIMUM RATINGS (UNLESS OTHERWISE NOTED,  $T_J=25^{\circ}\text{C}$ )**

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Drain-Source Voltage	$V_{DS}$	--	-100	--	--	V
Gate-Source Voltage	$V_{GS}$	--	-20	--	20	V
Drain Current	$I_D$	$T_C=25^{\circ}\text{C}$	--	--	-30	A
		$T_C=100^{\circ}\text{C}$	--	--	-20	A
Drain Current Pulsed (Note 1)	$I_{DM}$	$T_C=25^{\circ}\text{C}$	--	--	-120	A
Power Dissipation (Note 2)	$P_D$	$T_C=25^{\circ}\text{C}$	--	--	104	W
Single Pulsed Avalanche Energy	$E_{AS}$	$L=0.5\text{mH}$ , $V_{DD}=-80\text{V}$ , $R_G=25\Omega$ , starting temperature $T_J=25^{\circ}\text{C}$	--	--	289	mJ
Single Pulsed Current	$I_{AS}$	--	--	--	-34	A
Operation Junction Temperature Range	$T_J$	--	-55	--	150	$^{\circ}\text{C}$
Storage Temperature Range	$T_{stg}$	--	-55	--	150	$^{\circ}\text{C}$

**THERMAL CHARACTERISTICS**

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Thermal Resistance, Junction-case, Bottom	$R_{\theta JC}$	--	--	--	1.2	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-ambient	$R_{\theta JA}$	--	--	--	62.0	$^{\circ}\text{C/W}$
Soldering Temperature(SMD)	$T_{sold}$	Reflow soldering: $10 \pm 1$ sec, 3times	--	--	260	$^{\circ}\text{C}$

## ELECTRICAL CHARACTERISTICS (UNLESS OTHERWISE NOTED, $T_J=25^\circ\text{C}$ )

### Static characteristics

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Drain-source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-100	--	--	V
Drain-source Leakage Current	$I_{DSS}$	$V_{DS}=-100V, V_{GS}=0V, T_J=25^\circ\text{C}$	--	--	-1.0	$\mu A$
		$V_{DS}=-100V, V_{GS}=0V, T_J=125^\circ\text{C}$	--	-1.0	-10	
Gate-source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.5	--	-2.5	V
Static Drain-source On State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-15A$	--	35	50	m $\Omega$
		$V_{GS}=-4.5V, I_D=-10A$	--	45	65	
Gate Resistance	$R_g$	f=1MHz	--	12	--	$\Omega$

### Dynamic characteristics

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Input Capacitance	$C_{iss}$	f=1MHz, $V_{GS}=0V, V_{DS}=-25V$	--	4440	--	pF
Output Capacitance	$C_{oss}$		--	233	--	
Reverse Transfer Capacitance	$C_{rss}$		--	144	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-50V, V_{GS}=-10V,$ $R_G=9.1\Omega, I_D=-15A$ (Notes 3, 4)	--	9.8	--	ns
Turn-on Rise Time	$t_r$		--	41	--	
Turn-off Delay Time	$t_{d(off)}$		--	258	--	
Turn-off Fall Time	$t_f$		--	90	--	
Total Gate Charge	$Q_g$	$V_{DD}=-50V, V_{GS}=-10V, I_D=-15A$ (Notes 3, 4)	--	80	--	nC
Gate-source Charge	$Q_{gs}$		--	19	--	
Gate-drain Charge	$Q_{gd}$		--	15	--	
Gate-plateau Voltage	$V_{plateau}$		--	4.1	--	V

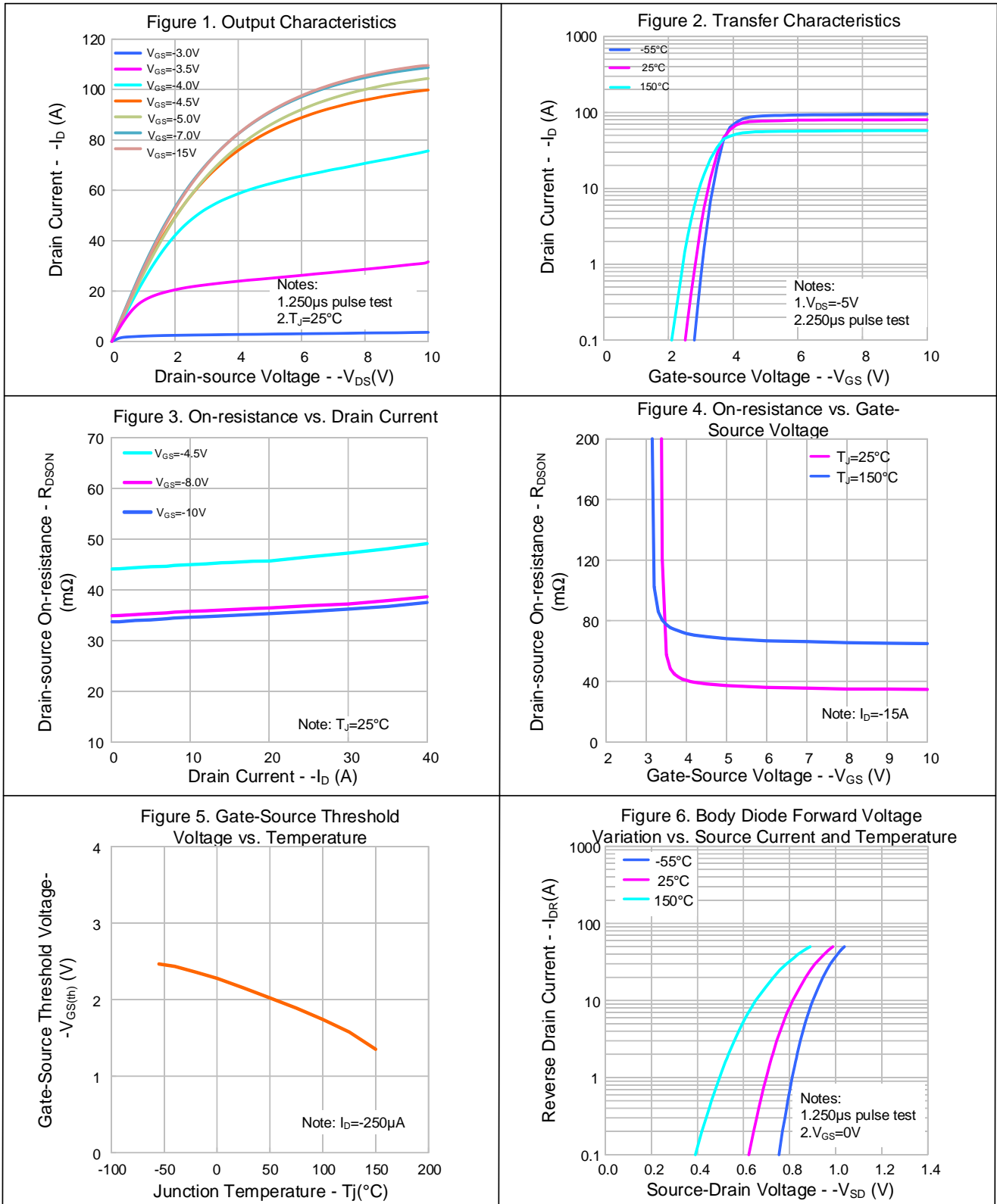
### Reverse diode characteristics

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Continuous Source Current	$I_S$	$T_C=25^\circ\text{C}$ , Integral Reverse P-N	--	--	-30	A
Pulsed Source Current	$I_{S,pulse}$	Junction Diode in the MOSFET	--	--	-120	
Diode Forward Voltage	$V_{SD}$	$I_S=-10A, V_{GS}=0V$	--	--	-1.4	V
Reverse Recovery Time	$T_{rr}$	$I_S=-15A, V_{GS}=0V,$	--	31	--	ns
Reverse Recovery Charge	$Q_{rr}$	dI/dt=100A/ $\mu s$ (Note 3)	--	0.05	--	$\mu C$

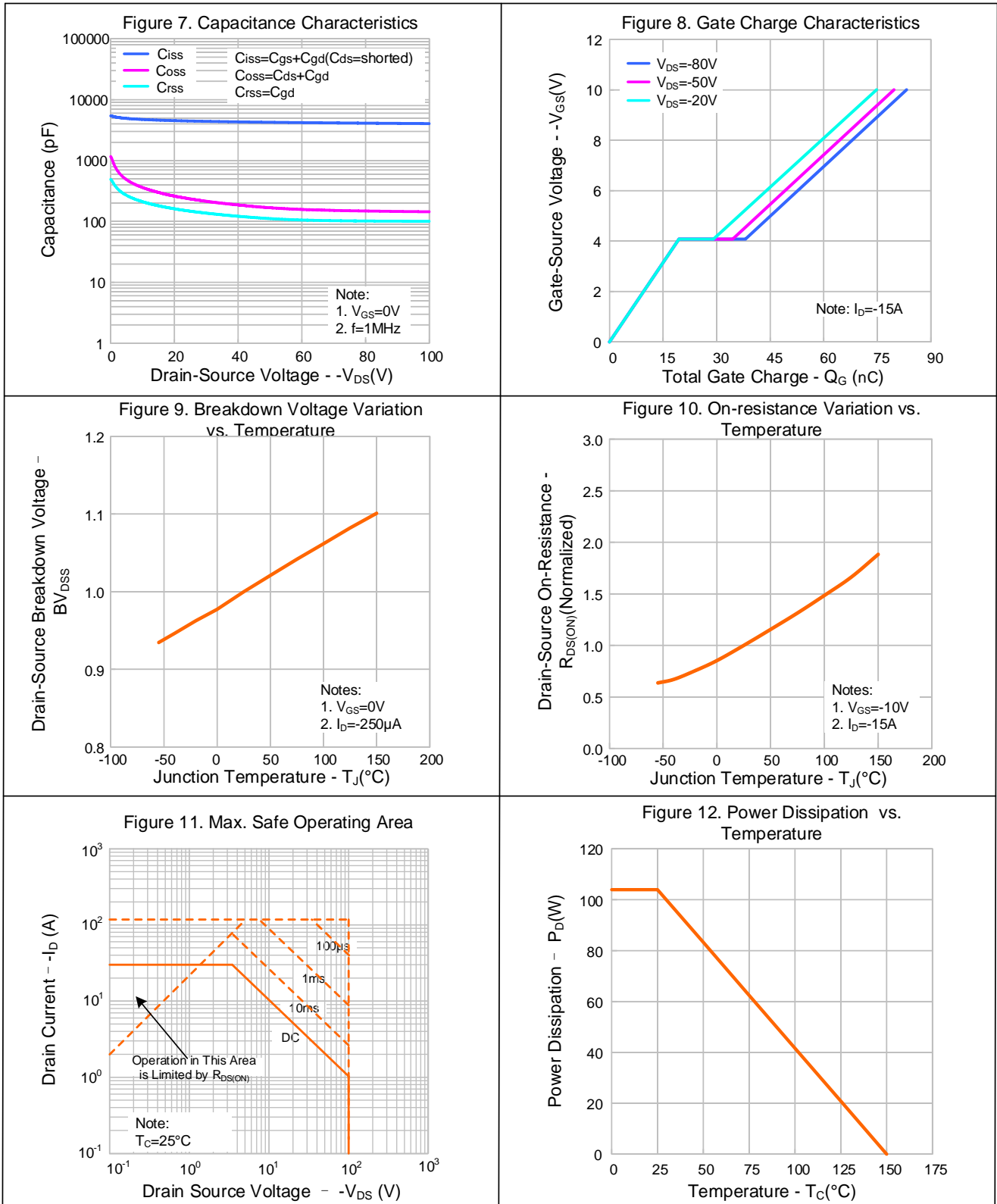
Notes:

- Pulse time 5 $\mu s$ ;
- The dissipation power will change with temperature, derating above 25 $^\circ\text{C}$ : 0.83W/ $^\circ\text{C}$ ;
- Pulse Test: Pulse width  $\leq 300\mu s$ , Duty cycles  $\leq 2\%$ ;
- Essentially independent of operating temperature.

**TYPICAL CHARACTERISTICS**

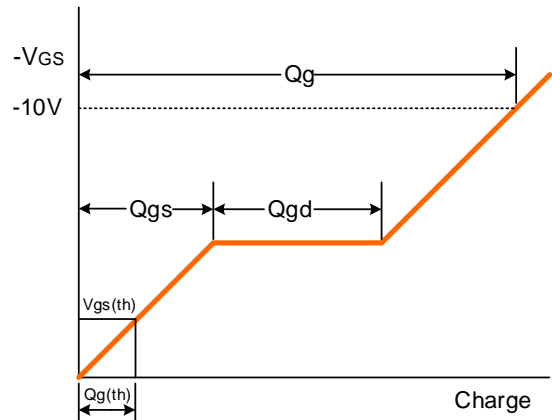
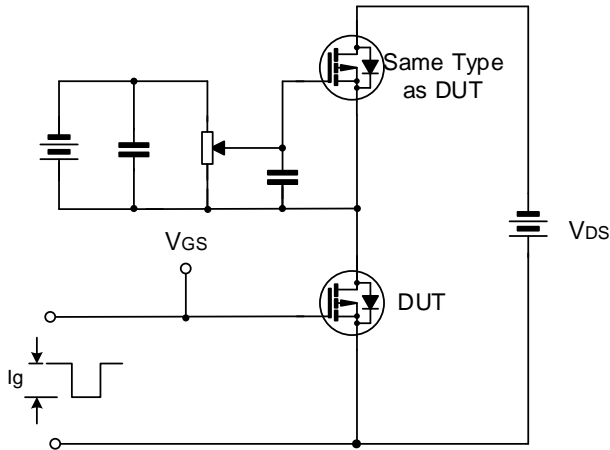


**TYPICAL CHARACTERISTICS (CONTINUED)**

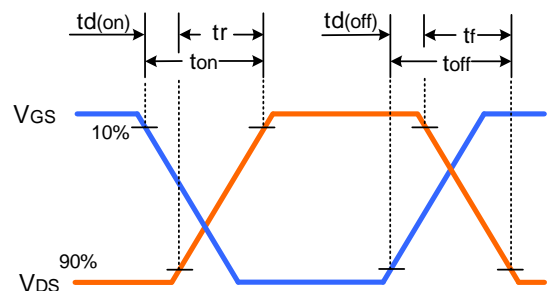
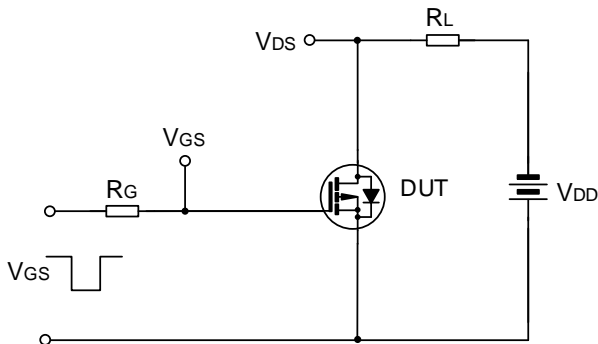


**TYPICAL TEST CIRCUIT**

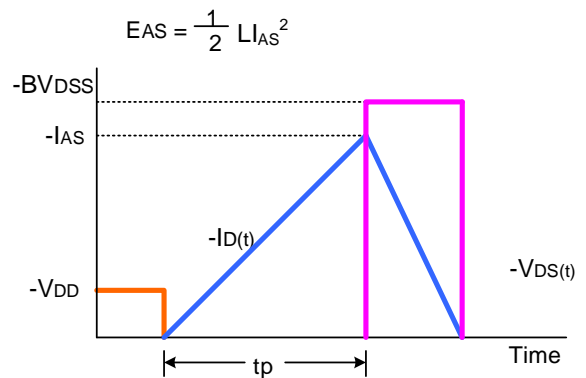
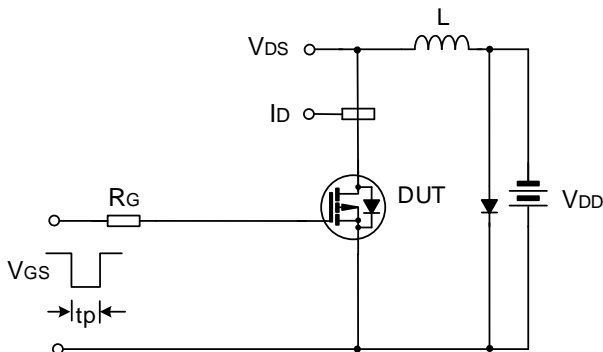
Gate Charge Test Circuit & Waveform



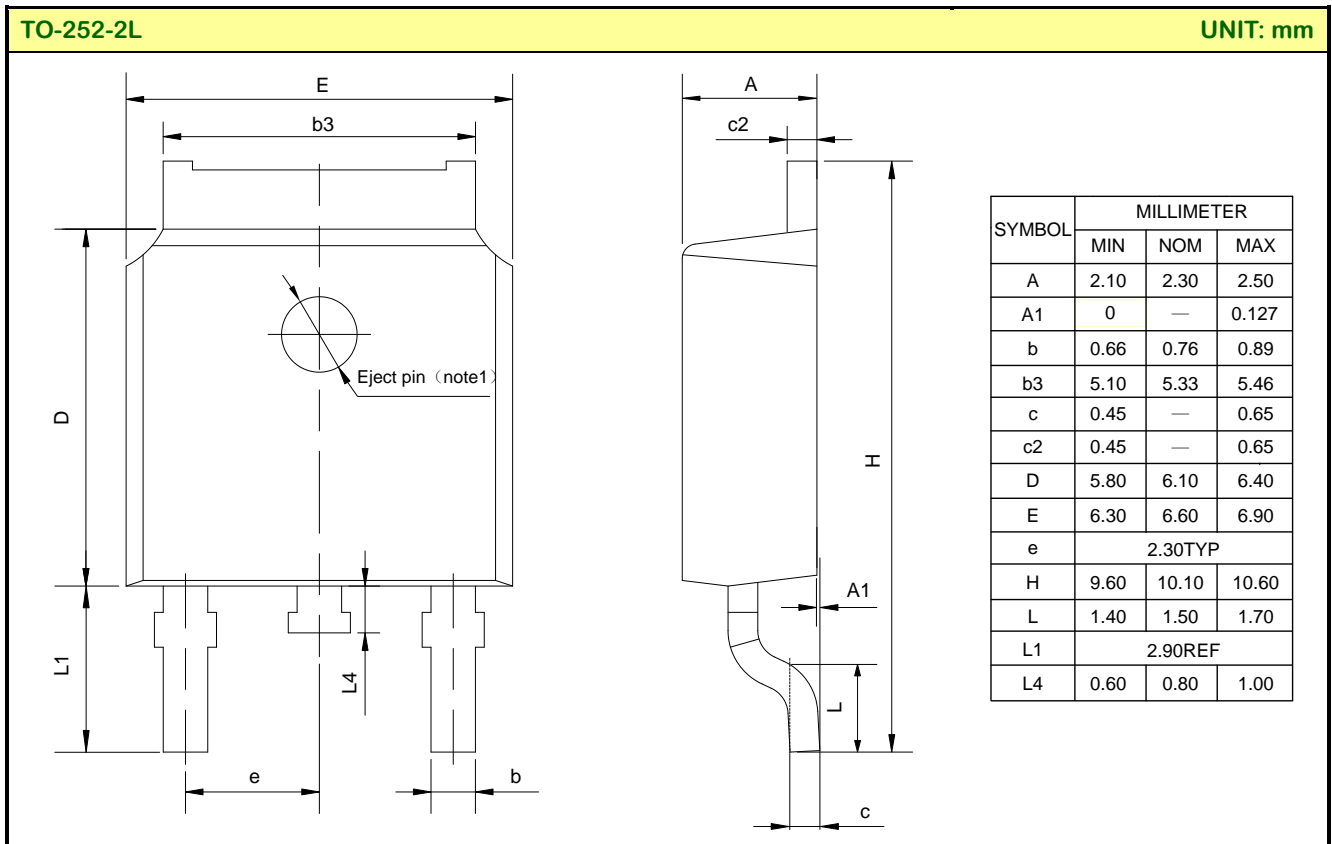
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



**PACKAGE OUTLINE**



**MOS DEVICES OPERATE NOTES:**

Electrostatic charges may exist in many things. Please take following preventive measures to prevent effectively the MOS electric circuit as a result of the damage which is caused by discharge:

- The operator must put on wrist strap which should be earthed to against electrostatic.
- Equipment cases should be earthed.
- All tools used during assembly, including soldering tools and solder baths, must be earthed.
- MOS devices should be packed in antistatic/conductive containers for transportation.

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Rev: 1.0

Revision History:

1. First release
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