

## 240A, 60V N-CHANNEL MOSFET

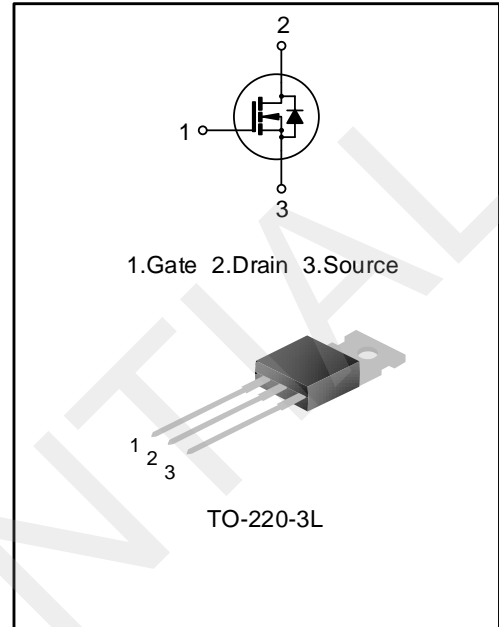
### DESCRIPTION

SVG062R0NT is an N-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 power management for UPS and Inverter Systems.

### FEATURES

- ◆ 240A, 60V,  $R_{DS(on)(typ.)}=1.6m\Omega@V_{GS}=10V$
- ◆ Low gate charge
- ◆ Low  $C_{rss}$
- ◆ Fast switching
- ◆ Extreme  $dv/dt$  rated
- ◆ 100% avalanche tested
- ◆ Pb-free lead plating
- ◆ RoHS compliant



### KEY PERFORMANCE PARAMETERS

Characteristics	Ratings	Unit
$V_{DS}$	60	V
$V_{GS(th)}$	2.5~3.5	V
$R_{DS(on),max}$	2.0	$m\Omega$
$I_D$	240	A
$Q_{g,typ}$	106	nC

### ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVG062R0NT	TO-220-3L	062R0NT	Pb free	Tube

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

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Drain-source Voltage	$V_{DS}$	--	60	--	--	V
Gate-source Voltage	$V_{GS}$	--	-20	--	20	V
Drain Current (Note 1)	$I_D$	$T_C=25^{\circ}\text{C}$	--	--	240	A
		$T_C=100^{\circ}\text{C}$	--	--	151	
		$T_C=25^{\circ}\text{C}$ (limited by package)	--	--	120	
Drain Current Pulsed (Note 2)	$I_{DM}$	$V_{GS}=10\text{V}$ , $T_C=25^{\circ}\text{C}$	--	--	960	A
Power Dissipation (Note 3)	$P_D$	$T_C=25^{\circ}\text{C}$	--	--	184	W
Single Pulsed Avalanche Energy	$E_{AS}$	$L=0.5\text{mH}$ , $V_{DD}=48\text{V}$ , $R_G=25\Omega$ , starting temperature $T_J=25^{\circ}\text{C}$	--	--	870	mJ
Single Pulsed Current	$I_{AS}$	--	--	--	59	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	$R_{\theta JC}$	--	--	--	0.68	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-ambient	$R_{\theta JA}$	--	--	--	62.5	$^{\circ}\text{C}/\text{W}$
Soldering Temperature (in line)	$T_{sold}$	$15_{-0}^{+2}$ sec, 1time	--	--	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	$BV_{DSS}$	$V_{GS}=0\text{V}$ , $I_D=250\mu\text{A}$	60	--	--	V
Drain-source Leakage Current	$I_{DSS}$	$V_{DS}=60\text{V}$ , $V_{GS}=0\text{V}$ , $T_J=25^{\circ}\text{C}$	--	--	1.0	$\mu\text{A}$
		$V_{DS}=60\text{V}$ , $V_{GS}=0\text{V}$ , $T_J=125^{\circ}\text{C}$	--	3.0	--	$\mu\text{A}$
Gate-source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}$ , $V_{DS}=0\text{V}$	--	--	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}$ , $I_D=250\mu\text{A}$	2.5	--	3.5	V
Static Drain-source On State Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}$ , $I_D=50\text{A}$	--	1.6	2.0	$\text{m}\Omega$
Gate Resistance	$R_g$	$f=1\text{MHz}$	--	1.4	--	$\Omega$

## Dynamic characteristics

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Input Capacitance	$C_{iss}$	$f=1\text{MHz}, V_{GS}=0\text{V}, V_{DS}=30\text{V}$	--	7370	--	pF
Output Capacitance	$C_{oss}$		--	1655	--	
Reverse Transfer Capacitance	$C_{rss}$		--	49	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=30\text{V}, V_{GS}=10\text{V}, R_G=2.5\Omega,$ $I_D=50\text{A}$ (Notes 4, 5)	--	32	--	ns
Turn-on Rise Time	$t_r$		--	34	--	
Turn-off Delay Time	$t_{d(off)}$		--	62	--	
Turn-off Fall Time	$t_f$		--	17	--	
Total Gate Charge	$Q_g$	$V_{DD}=30\text{V}, V_{GS}=10\text{V}, I_D=50\text{A}$ (Notes 4, 5)	--	106	--	nC
Gate-source Charge	$Q_{gs}$		--	41	--	
Gate-drain Charge	$Q_{gd}$		--	21	--	
Gate-plateau Voltage	$V_{plateau}$		--	5.4	--	

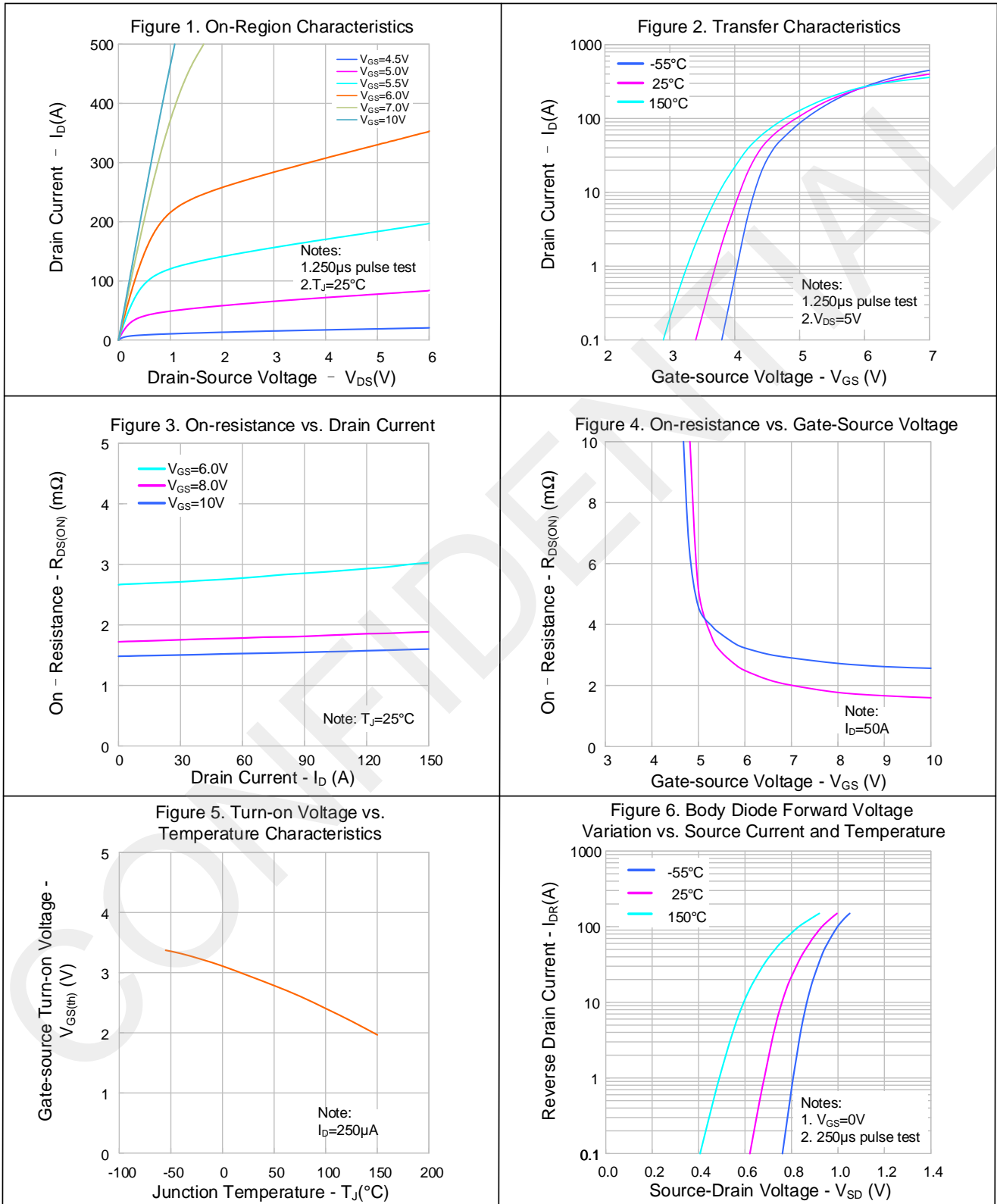
## Reverse diode characteristics

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Continuous Diode Forward Current	$I_S$	$T_C=25^\circ\text{C}$ , Integral reverse P-N junction diode in the MOSFET	--	--	240	A
Diode Pulse Current	$I_{S,pulse}$		--	--	960	
Diode Forward Voltage	$V_{SD}$	$I_S=50\text{A}, V_{GS}=0\text{V}$	--	--	1.4	V
Reverse Recovery Time	$T_{rr}$	$I_S=50\text{A}, V_{GS}=0\text{V}, V_R=34\text{V}$	--	72	--	ns
Reverse Recovery Charge	$Q_{rr}$	$dI_F/dt=100\text{A}/\mu\text{s}$ (Note 4)	--	138	--	nC

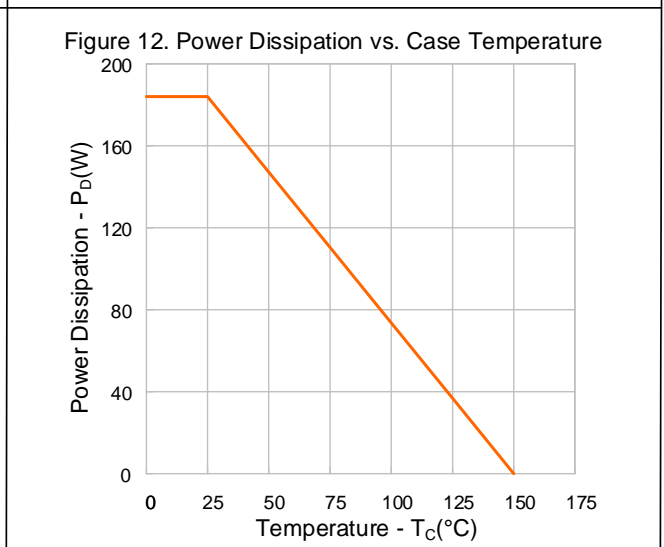
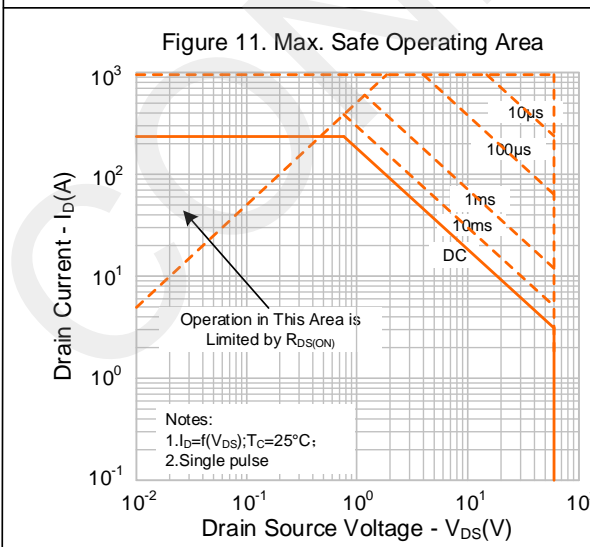
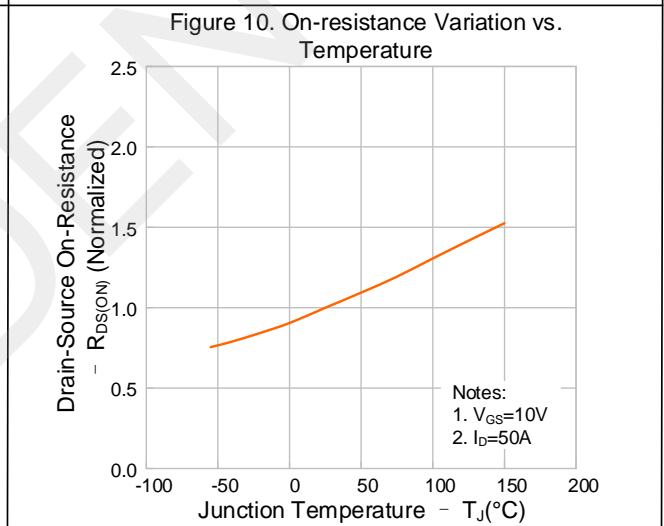
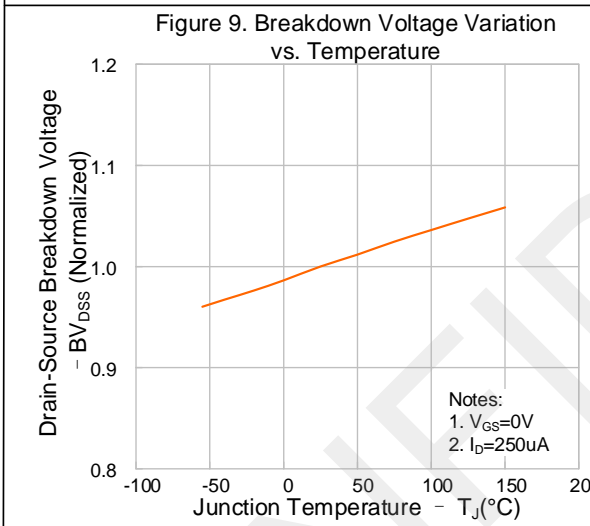
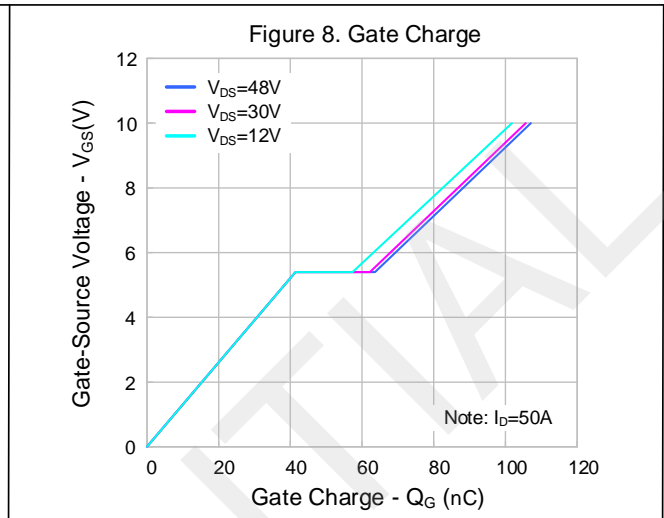
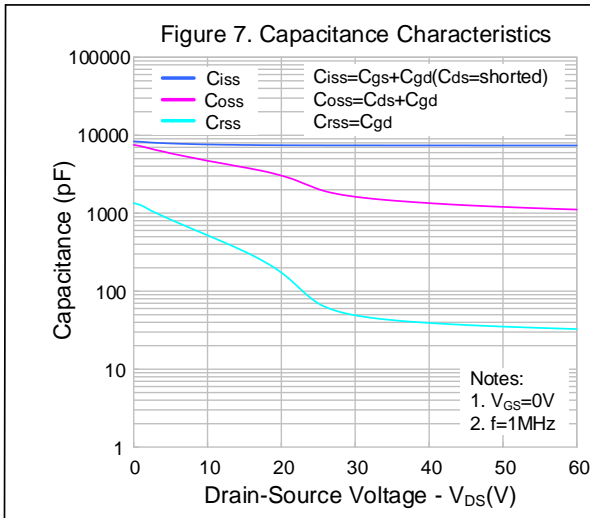
### Notes:

- The rated value only refers to the maximum absolute value at the case temperature of  $25^\circ\text{C}$  in the specification. If the case temperature is higher than  $25^\circ\text{C}$ , it should be derated according to the actual environmental conditions;
- Pulse time  $5\mu\text{s}$ , pulse width is limited by the maximum junction temperature;
- The dissipation power will change with temperature, derating above  $25^\circ\text{C}$ :  $1.47\text{W}/^\circ\text{C}$ ;
- Pulse Test: Pulse width  $\leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$ ;
- Essentially independent of operating temperature.

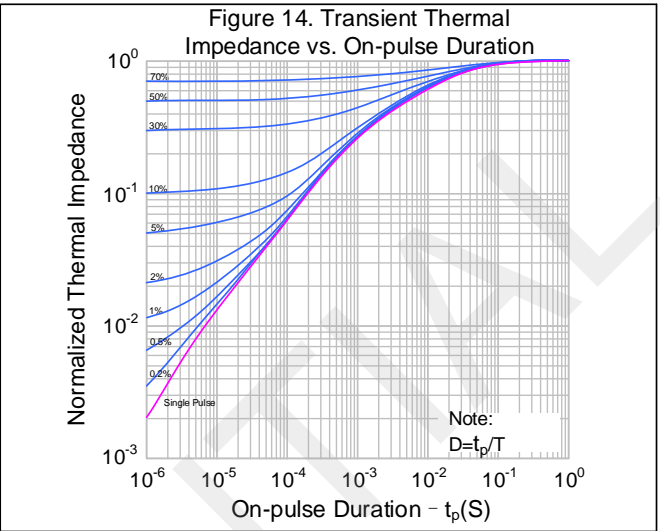
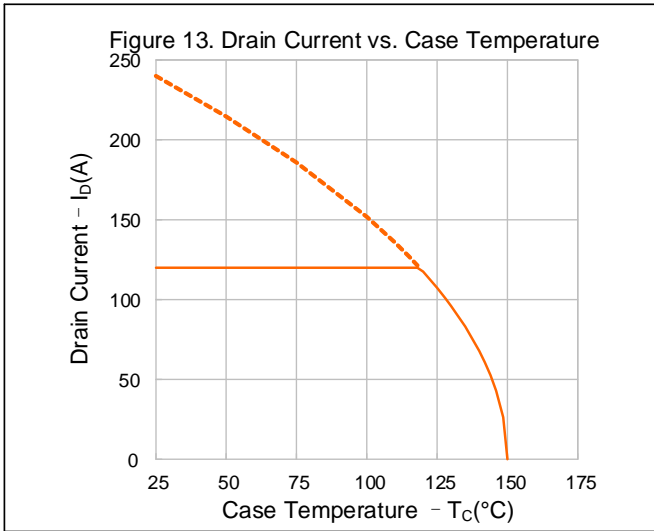
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (CONTINUED)

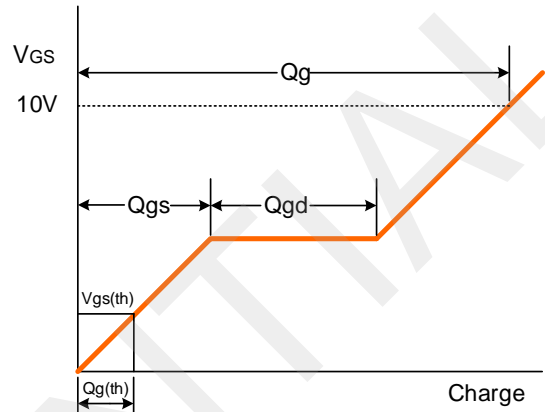
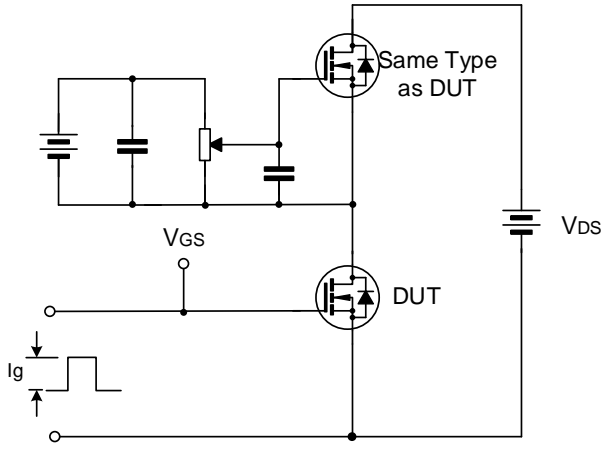


TYPICAL CHARACTERISTICS (CONTINUED)

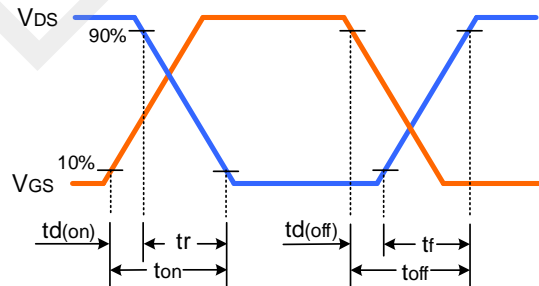
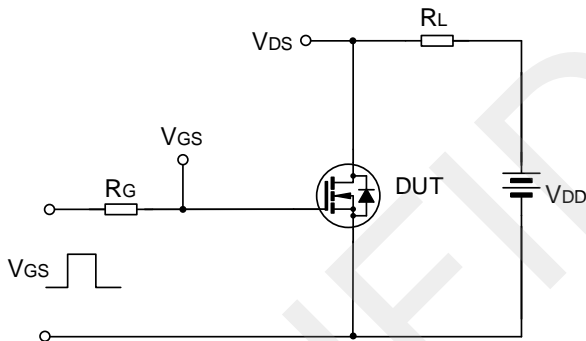


**TYPICAL TEST CIRCUIT**

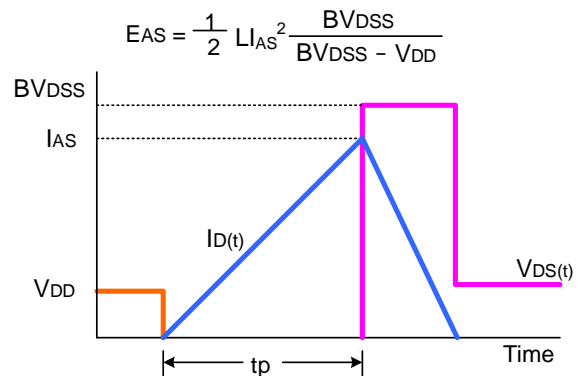
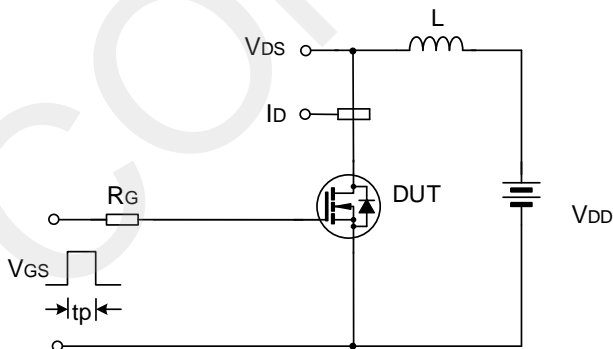
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



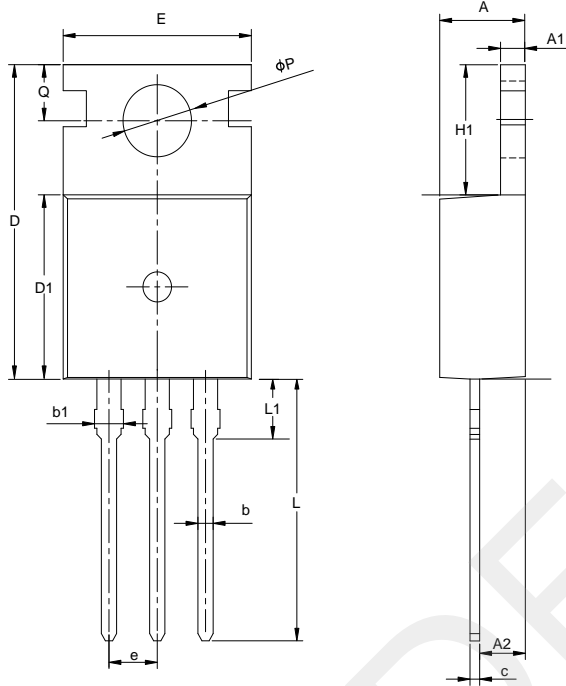
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

TO-220-3L

UNIT: mm



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	1.00	1.30	1.50
A2	1.80	2.40	2.80
b	0.60	0.80	1.00
b1	1.00	—	1.60
c	0.30	—	0.70
D	15.10	15.70	16.10
D1	8.10	9.20	10.00
E	9.60	9.90	10.40
e	2.54BSC		
H1	6.10	6.50	7.00
L	12.60	13.08	13.60
L1	—	—	3.95
ΦP	3.40	3.70	3.90
Q	2.60	—	3.20

**Important notice:**

1. The instructions are subject to change without notice!
2. Customers should obtain the latest relevant information before placing orders and should verify that such information is complete and current. Please read the instructions carefully before using our products, including the circuit operation precautions.
3. Our products are consumer electronic products or the other civil electronic products.
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Rev.: **1.0**

Revision History:

1. First release
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