

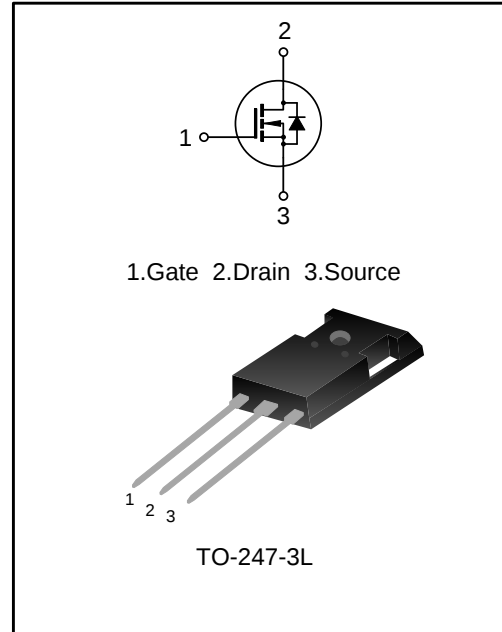
35A, 650V SUPER JUNCTION MOS POWER TRANSISTOR

DESCRIPTION

SVSP35NF65P7D3 is an N-channel enhancement mode high voltage power MOSFETs produced using Silan's DPMOS technology. It achieves low conduction loss and switching losses. It leads the design engineers to their power converters with high efficiency, high power density, and superior thermal behavior. Furthermore, it's universal applicable, i.e., suitable for hard and soft switching topologies.

FEATURES

- ◆ 35A, 650V, $R_{DS(on)}(typ.)=85m\Omega@V_{GS}=10V$
- ◆ New revolutionary high voltage technology
- ◆ Periodic avalanche rated
- ◆ Extreme dv/dt rated
- ◆ High peak current capability



ORDERING INFORMATION

Part No.	Package	Marking	Hazardous Substance Control	Packing Type
SVSP35NF65P7D3	TO-247-3L	P35NF65	Halogen free	Tube

ABSOLUTE MAXIMUM RATINGS (UNLESS OTHERWISE NOTED, T_J=25°C)

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V _{DS}	650	V
Gate-Source Voltage		V _{GS}	±30	V
Drain Current	T _C =25°C	I _D	35	A
	T _C =100°C		22	
Drain Current Pulsed(Pulse time 5μs)		I _{DM}	140	A
Power Dissipation (T _C =25°C) - Derate above 25°C		P _D	298	W
			2.4	W/°C
Single Pulsed Avalanche Energy	(Note1)	E _{AS}	1131	mJ
Reverse diode dv/dt	(Note 2)	dv/dt	50	V/ns
MOSFET dv/dt ruggedness	(Note 3)	dv/dt	100	V/ns
Operation Junction Temperature Range		T _J	-55~+150	°C
Storage Temperature Range		T _{stg}	-55~+150	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Test conditions	Ratings			Unit
			Min.	Typ.	Max.	
Thermal Resistance, Junction-to-Case	R _{θJC}	--	--	--	0.42	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	--	--	--	50	°C/W
Soldering Temperature (in line)	T _{sold}	15 ⁺² ₋₀ sec, 1time	--	--	260	°C

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

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650	--	--	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	--	--	6.0	μA
		$V_{DS}=650V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	--	80	--	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	--	--	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.5	--	4.5	V
Static Drain- Source on State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=17.5A$	--	85	100	m Ω
Gate resistance	R_g	$f=1\text{MHz}$	--	1.1	--	Ω
Input Capacitance	C_{iss}	$V_{DS}=100V, V_{GS}=0V, f=1.0\text{MHz}$	--	2923	--	pF
Output Capacitance	C_{oss}		--	109	--	
Reverse Transfer Capacitance	C_{rss}		--	20	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=325V, V_{GS}=10V, R_G=1.6\Omega, I_D=35A$ (Note 4,5)	--	28	--	ns
Turn-on Rise Time	t_r		--	69	--	
Turn-off Delay Time	$t_{d(off)}$		--	92	--	
Turn-off Fall Time	t_f		--	28	--	
Total Gate Charge	Q_g	$V_{DD}=520V, V_{GS}=10V, I_D=35A$ (Note 4,5)	--	139	--	nC
Gate-Source Charge	Q_{gs}		--	21	--	
Gate-Drain Charge	Q_{gd}		--	92	--	
Gate-plate voltage	$V_{plateau}$		--	7.1	--	V

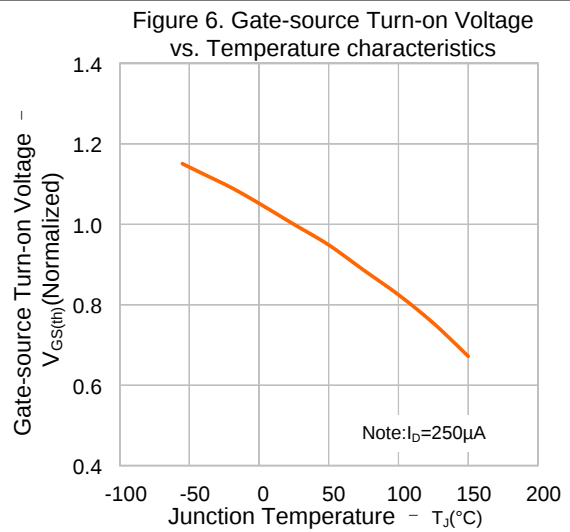
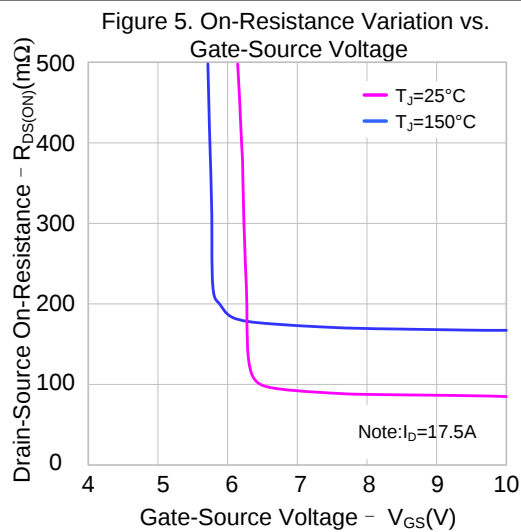
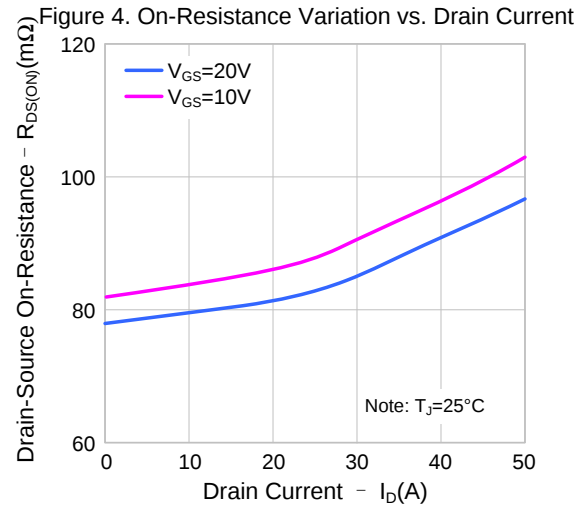
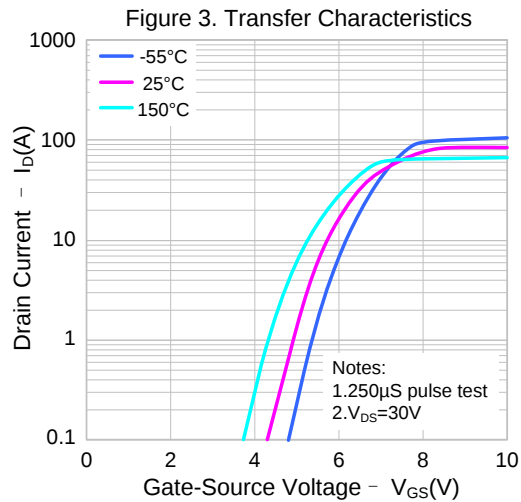
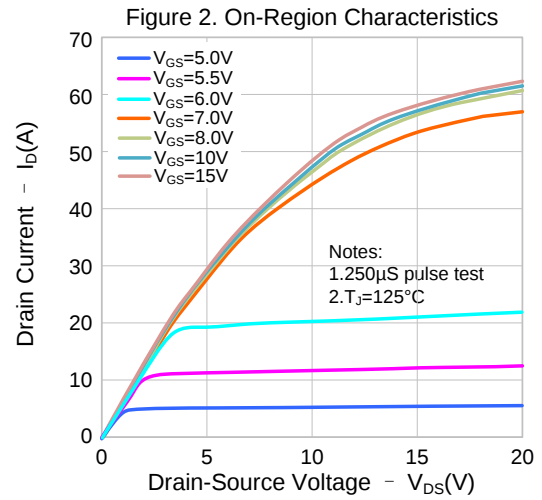
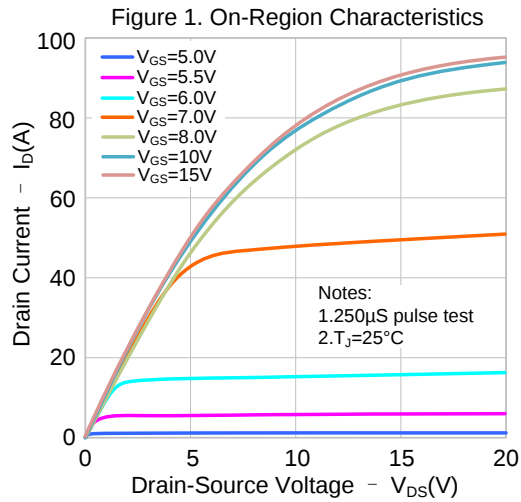
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	$T_C=25^{\circ}\text{C}$, Integral Reverse P-N	--	--	35	A
Pulsed Source Current	I_{SM}	Junction Diode in the MOSFET	--	--	140	
Diode Forward Voltage	V_{SD}	$I_S=35A, V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	T_{rr}	$I_S=35A, V_{GS}=0V, dI_F/dt=100A/\mu s$ (Note 4)	--	125	--	ns
Reverse Recovery Charge	Q_{rr}		--	0.6	--	μC
Reverse Recovery Peak Current	I_{rrm}		--	10	--	A

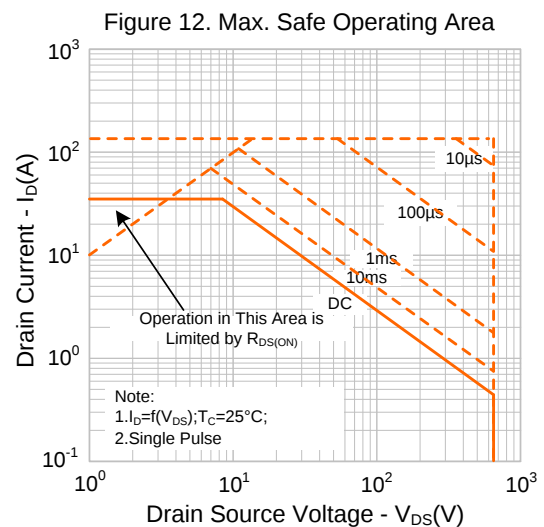
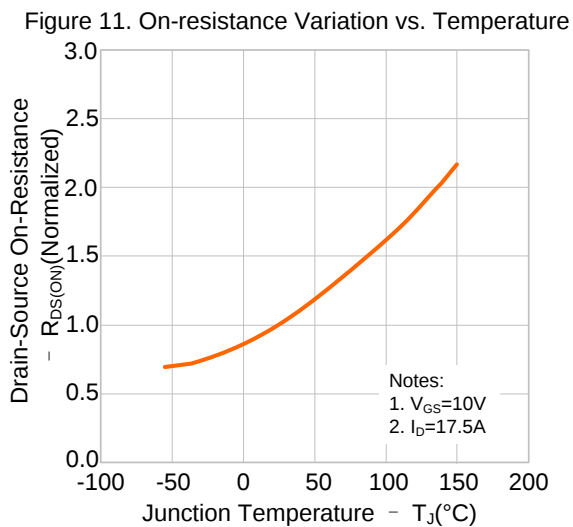
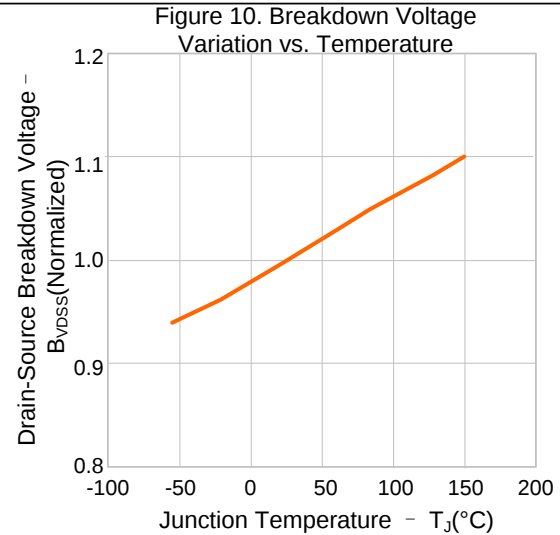
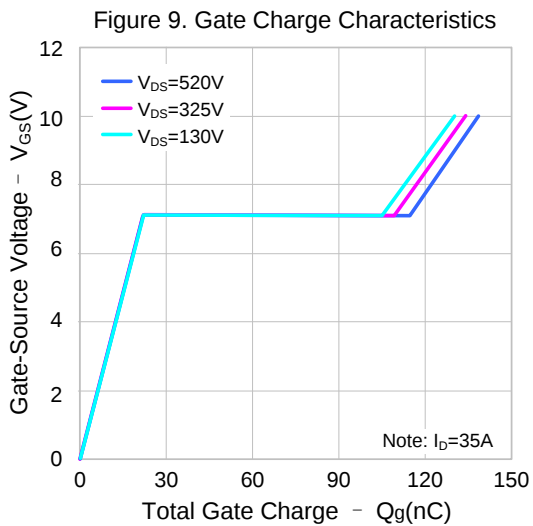
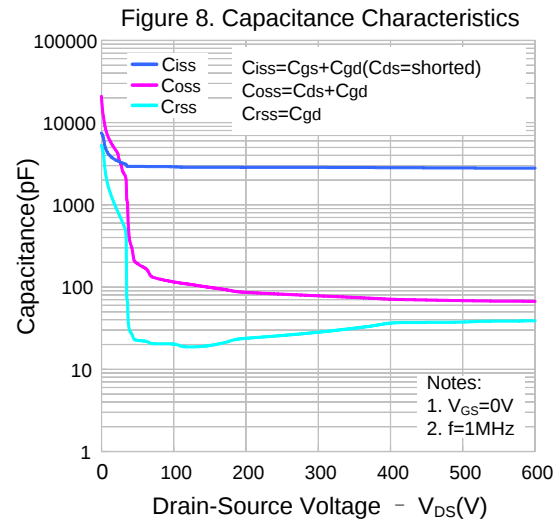
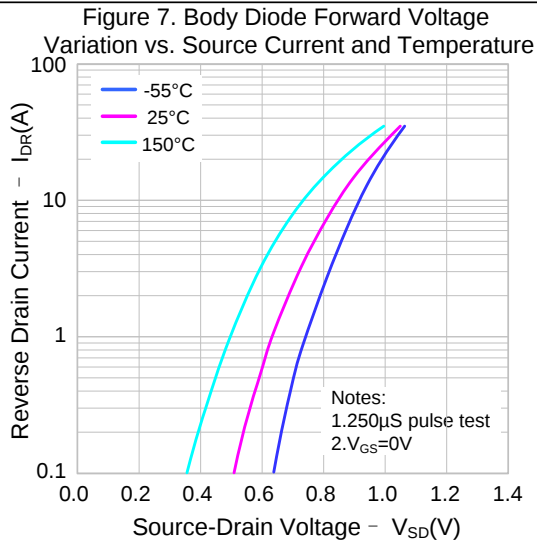
Notes:

1. $L=79\text{mH}, I_{AS}=5.0A, V_{DD}=100V, R_G=25\Omega$, starting temperature $T_J=25^{\circ}\text{C}$;
2. $V_{DS}=0\sim 400V, I_{SD}\leq 35A, T_J=25^{\circ}\text{C}$;
3. $V_{DS}=0\sim 400V$;
4. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycles $\leq 2\%$;
5. Essentially independent of operating temperature.

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (CONTINUED)



TYPICAL CHARACTERISTICS (CONTINUED)

Figure 13. Power dissipation vs. Case Temperature

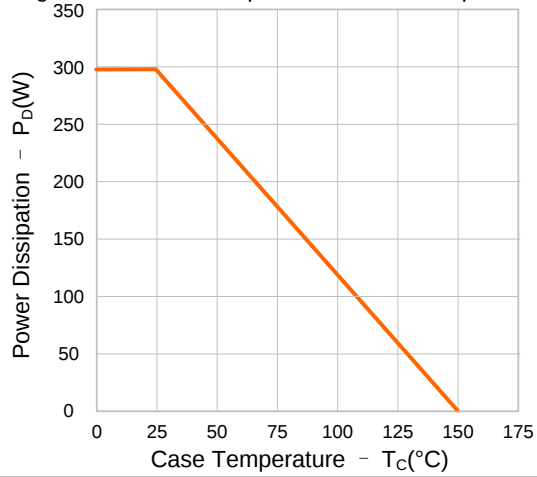


Figure 14. Max. Drain Current vs. Case Temperature

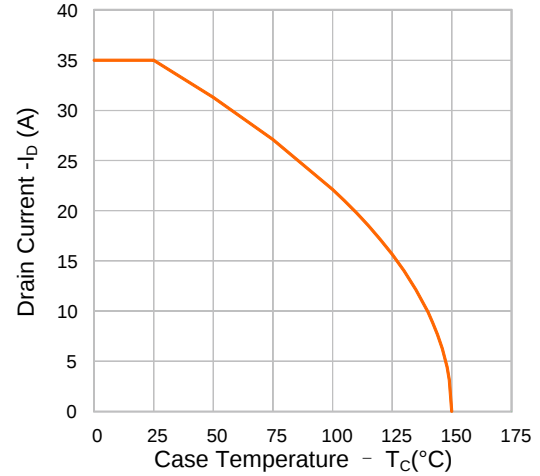
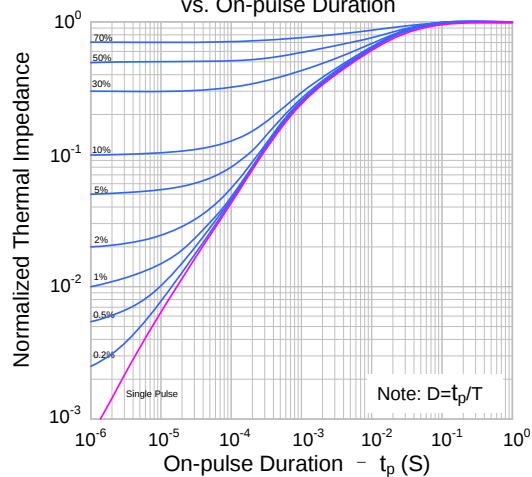
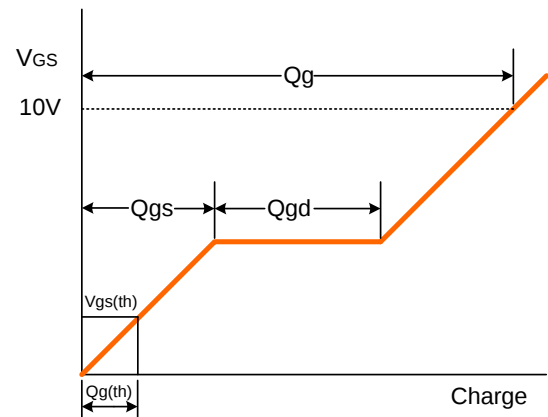
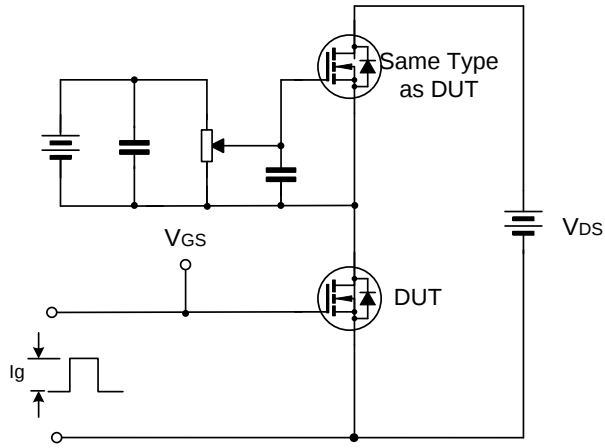


Figure 15. Transient Thermal Impedance vs. On-pulse Duration

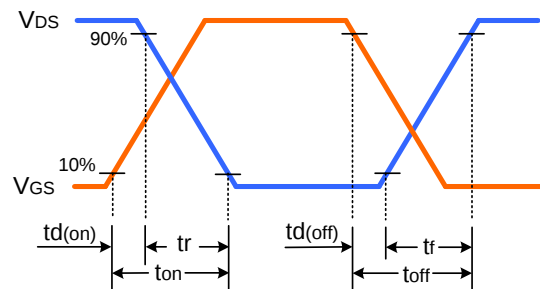
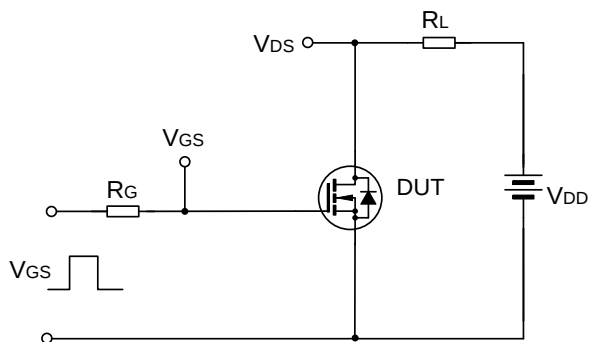


TYPICAL TEST CIRCUIT

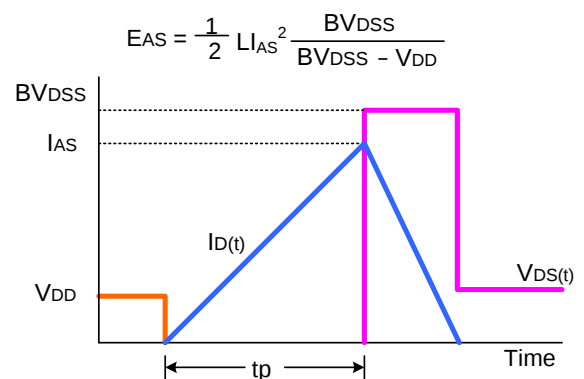
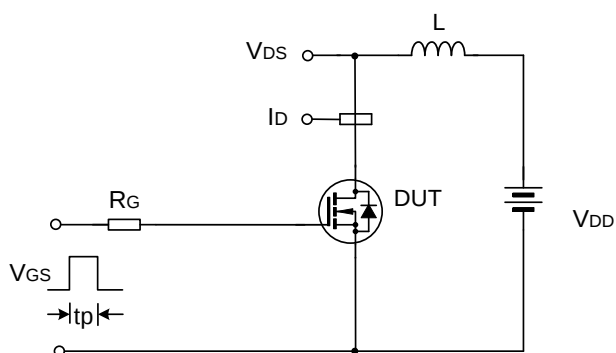
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



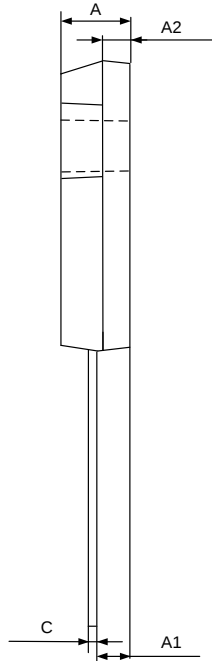
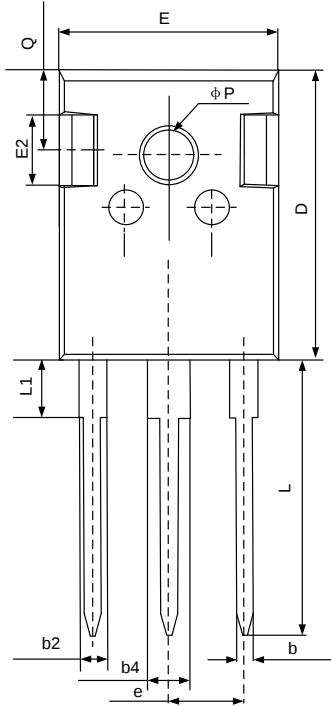
Unclamped Inductive Switching Test Circuit & Waveform



PACKAGE OUTLINE

TO-247-3L

UNIT: mm



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	—	1.36
b2	1.91	—	2.25
b4	2.91	—	3.25
c	0.51	—	0.75
D	20.80	21.00	21.30
E	15.50	15.80	16.10
E2	4.40	5.00	5.20
e	5.44 BSC		
L	19.72	19.92	20.22
L1	—	—	4.30
Q	5.60	5.80	6.00
P	3.40	—	3.80

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.
4. When using our products, please do not exceed the maximum rating of the products, otherwise the reliability of the whole machine will be affected. There is a certain possibility of failure or malfunction of any semiconductor product under specific conditions. The buyer is responsible for complying with safety standards and taking safety measures when using our products for system design, sample and whole machine manufacturing, so as to avoid potential failure risk that may cause personal injury or property loss.
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Rev.: 1.2

Revision History:

1. Update figures 6, 12 and 14
2. Add figure 15

Rev.: 1.1

Revision History:

1. Update ELECTRICAL CHARACTERISTICS
2. Update the template of datasheet

Rev.: 1.0

Revision History:

1. First release
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