

### Features

- Uses advanced SGT technology
- Extremely low on-resistance RDS(on)
- Excellent gate charge x RDS(on) product(FOM)

Product Summary			
V <sub>DS</sub>	R <sub>DS(on)</sub> (mΩ) Typ	I <sub>D</sub> (A)	Q <sub>g</sub> (Typ)
80V	1.27 @ 10V 50A	360	205nc

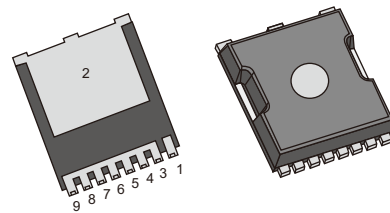
### Mechanical Data

- Case:TOLL Package

TOLL  
D016N08T

### Application

- Motor control and drives
- Battery management
- DC/DC converter
- General purpose applications



### Ordering Information

Part No.	Package Type	Package	Quality(box)
D016N08T	TOLL	Tape & Reel	2000

### Block Diagram

Pin Definition:  
1. Gate  
2. Drain  
3/4/5/6/7/8/9. Source

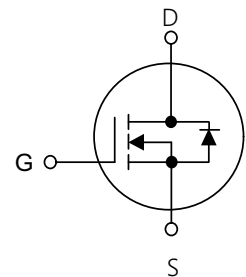


Table1 Absolute Maximum Ratings (T<sub>c</sub>=25°C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	80	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	T <sub>c</sub> =25°C	360
		T <sub>c</sub> =100°C	227
Pulsed Drain Current (Note 1)	I <sub>DM</sub>	1080	A
Single Pulse Avalanche Energy(Note 2)	E <sub>AS</sub>	2704	mJ
Power Dissipation T <sub>c</sub> =25°C	P <sub>D</sub>	312	W
Operating Junction and Storage Temperature	T <sub>J</sub> /T <sub>STG</sub>	-55~+150	°C

**Table 2. Thermal Characteristics**

Parameter	Symbol	Value	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	62	$^{\circ}C/W$
Thermal resistance Junction to Case	$R_{\theta JC}$	0.4	$^{\circ}C/W$

**Table 3. Electrical Characteristics ( $T_J=25^{\circ}C$ , unless otherwise specified)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	80	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$	-	-	1	$\mu A$
Gate- Source Leakage Current	Forward	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA
	Reverse	$V_{GS}=-20V, V_{DS}=0V$	-	-	-100	nA
On Characteristics(Note 3)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=50A$	-	1.27	1.6	m $\Omega$
Transconductance	$g_{fs}$	$V_{GS}=5V, I_D=40A$	-	227	-	s
Dynamic Characteristics(Note 4)						
Input Capacitance	$C_{iss}$	$V_{DS}=40V, V_{GS}=0V, f=1MHz$	-	14140	-	pF
Output Capacitance	$C_{oss}$		-	2259	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	61	-	pF
Gate Resistance	$R_G$	$V_{DD}=0V, V_{GS}=0V, f=1MHz$	-	1.85	-	$\Omega$
Switching Characteristics (Note 4)						
Turn-On Delay Time	$t_d(on)$	$V_{DS}=40V,$ $V_{GS}=10V, R_L=3\Omega,$	-	38	-	ns
Turn-On Rise Time	$t_r$		-	132	-	ns
Turn-Off Delay Time	$t_d(off)$		-	126	-	ns
Turn-Off Fall Time	$t_f$		-	153	-	ns
Total Gate Charge	$Q_G$	$V_{DS}=40V, I_D=50A,$ $V_{GS}=10V$	-	205	-	nC
Gate-Source Charge	$Q_{GS}$		-	54	-	nC
Gate-Drain Charge	$Q_{GD}$		-	46	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=50A$	-	0.8	1.2	V
Maximum Continuous Drain-Source Diode Forward Current	$I_S$		-	-	360	A
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0V, I_F=30A$ $dI_F/dt=500A/\mu s$	-	112	-	ns
Reverse Recovery Charge	$Q_{RR}$		-	220	-	nC

Notes : 1 Repetitive Rating:Pulse width limited by maximum junction temperature

2  $L=0.5mH, R_G=25\Omega, Starting T_J=25^{\circ}C$

3 Pulse Test: Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$

4 Guaranteed by design, not subject to production

Typical Characteristics Diagrams

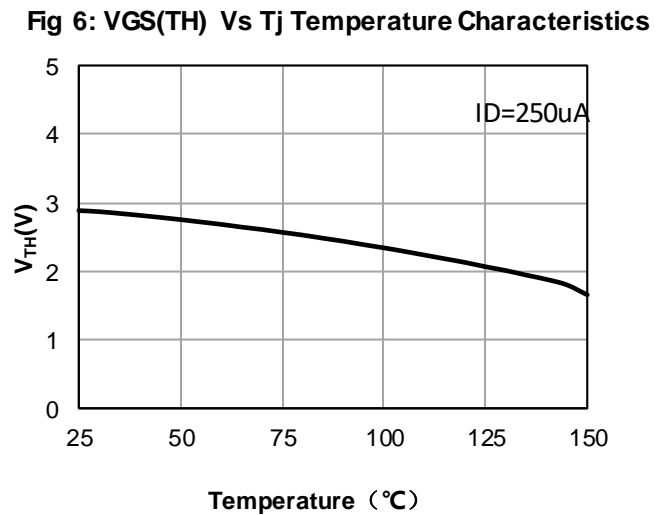
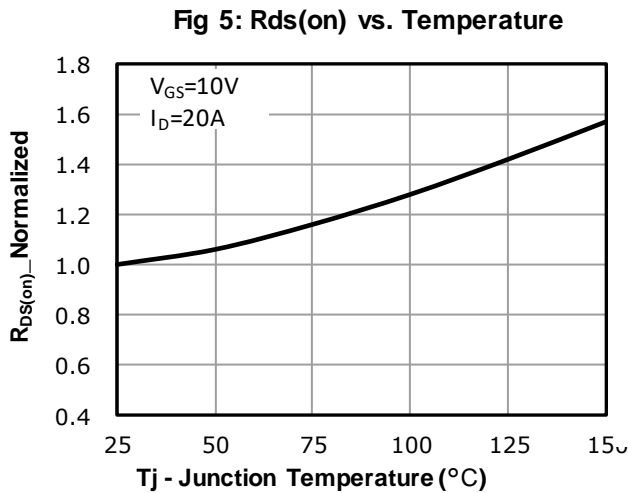
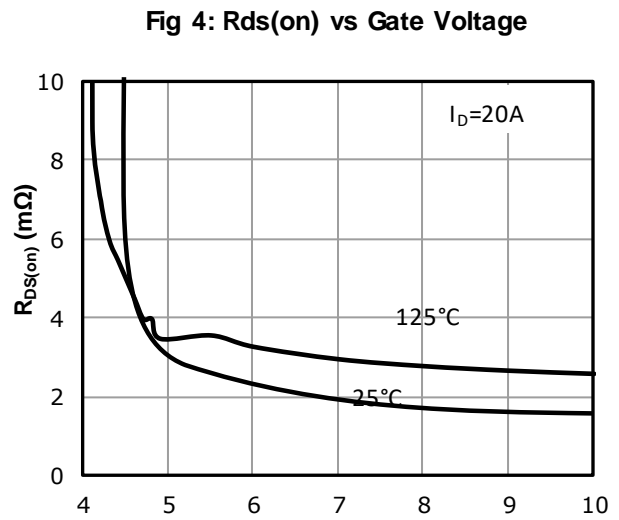
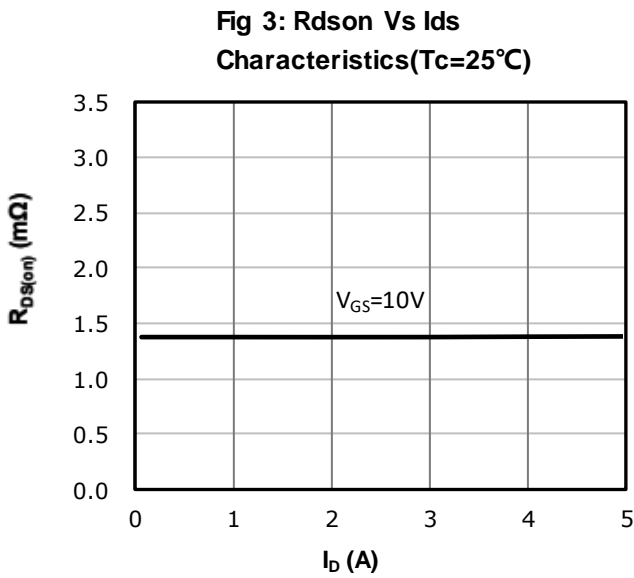
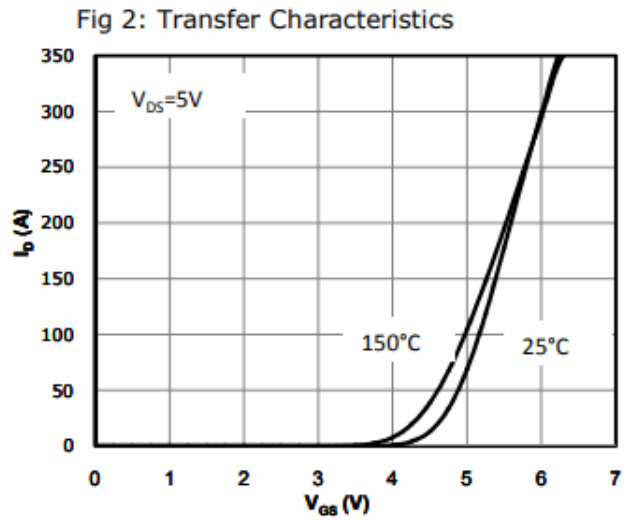
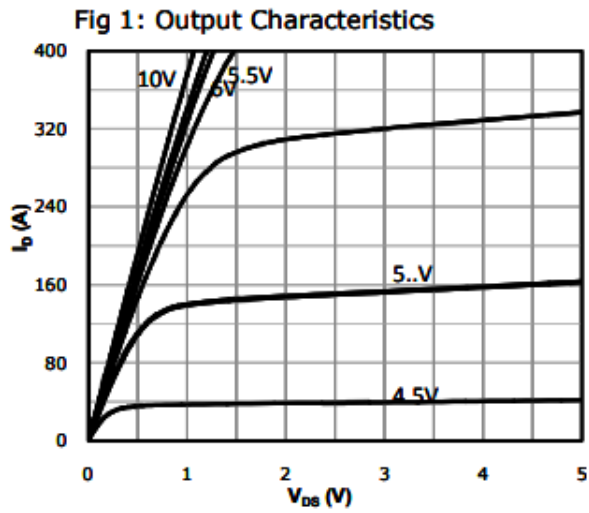


Fig 7: BVDSS vs. Temperature

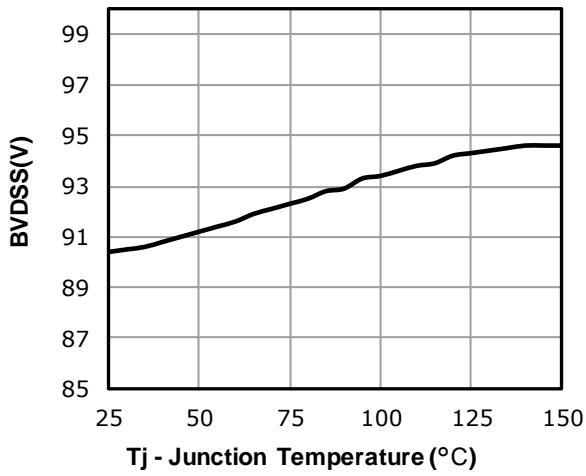


Fig 8: Capacitance Characteristics

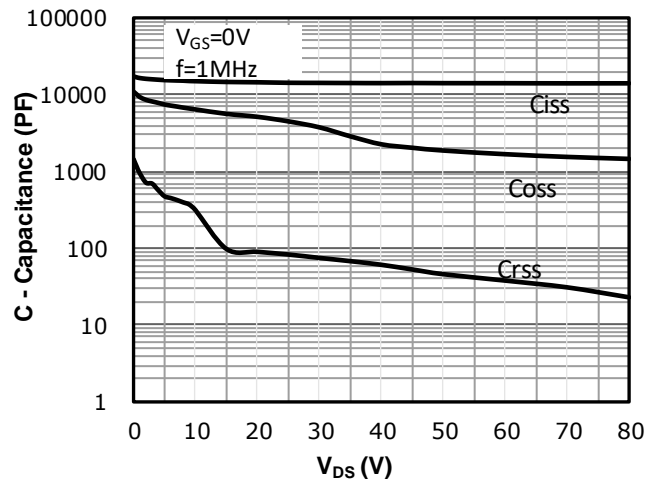


Fig 9: Gate Charge Characteristics

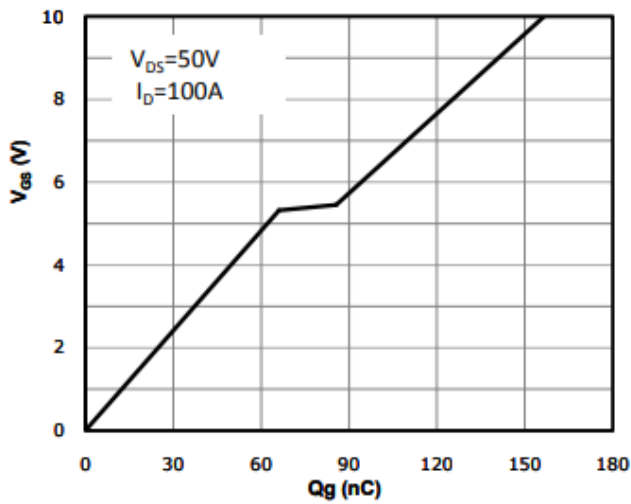


Fig 10: Body-diode Forward Characteristics

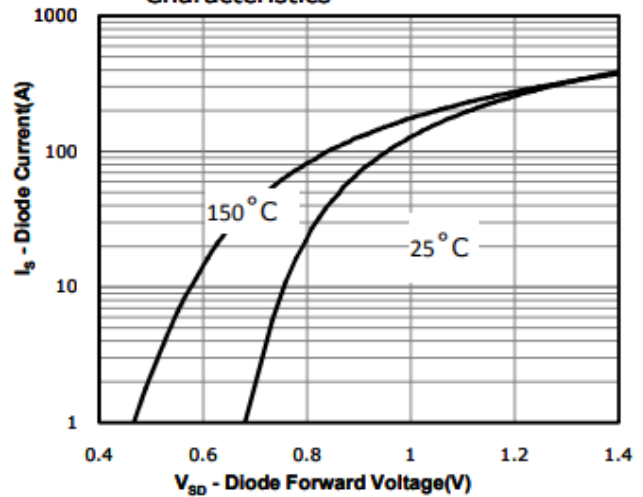


Fig 11: Power Dissipation

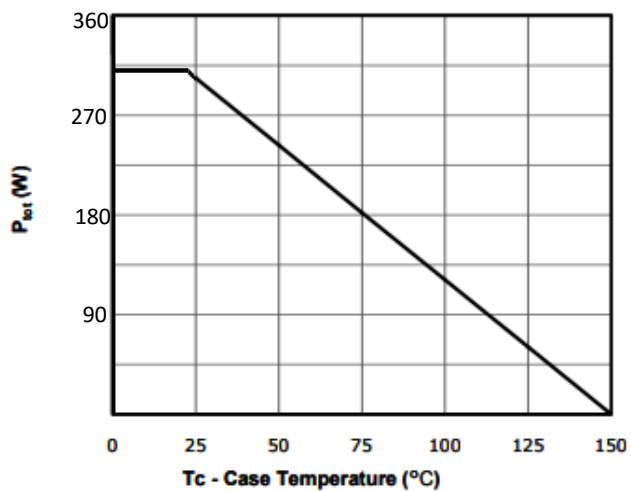


Fig 12: Drain Current Derating

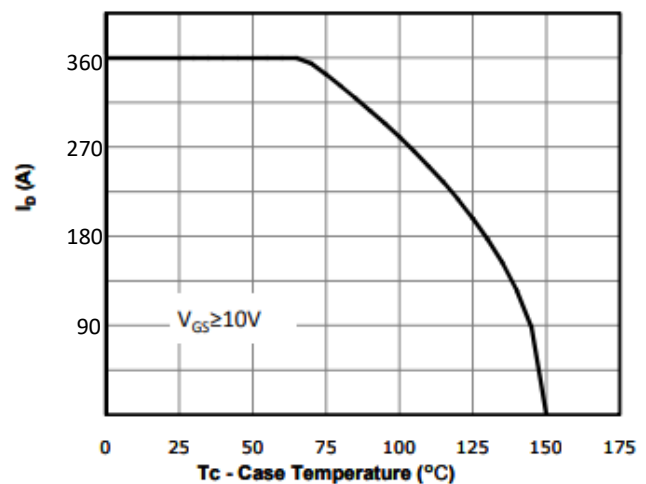


Fig 13: Safe Operating Area

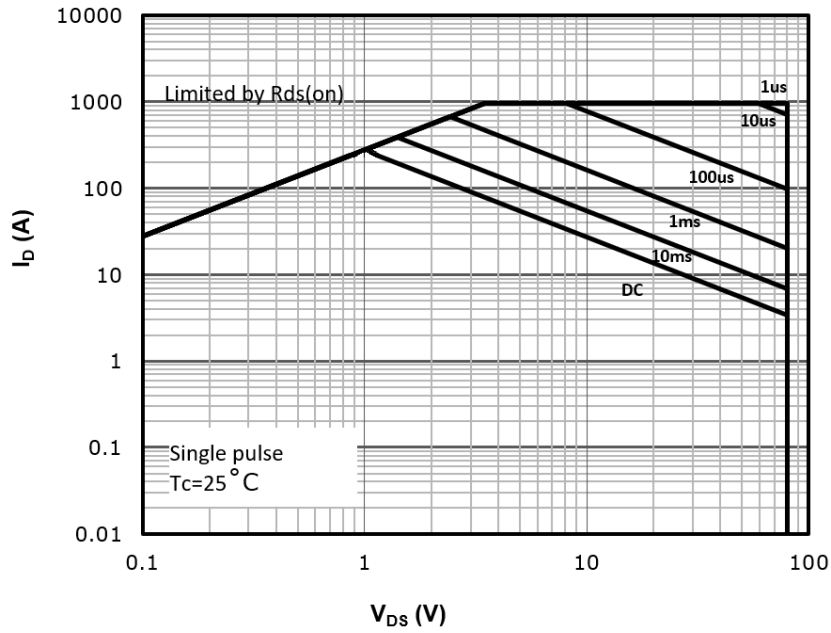
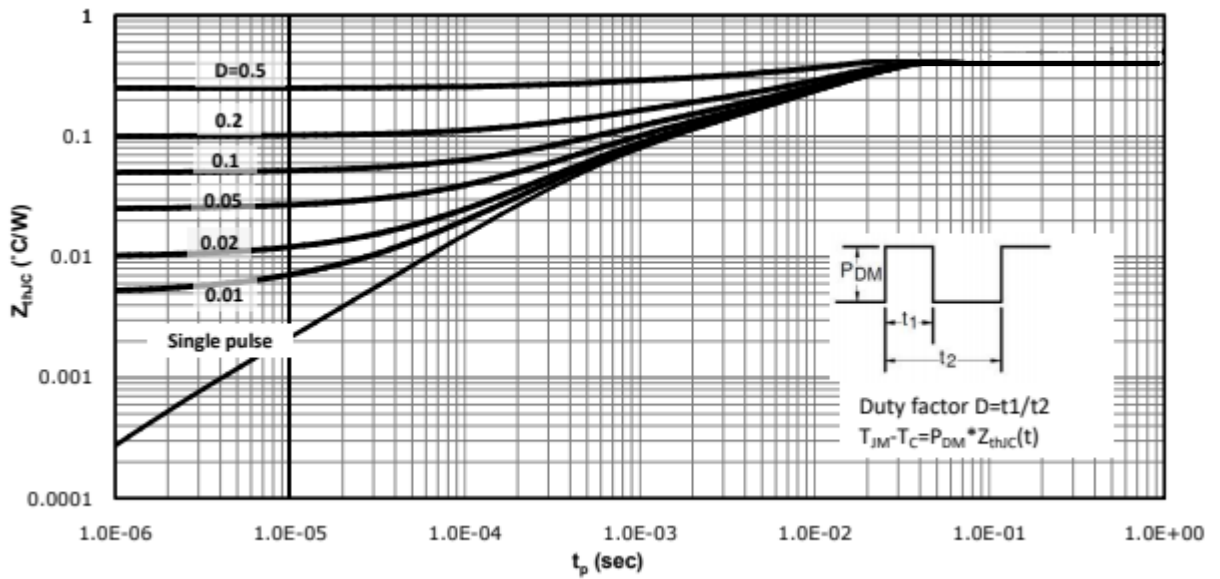
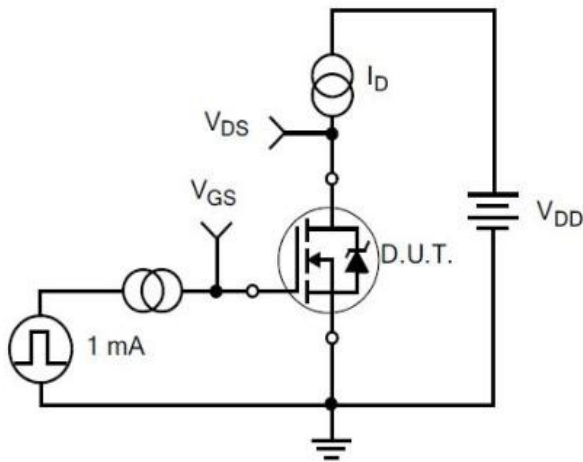


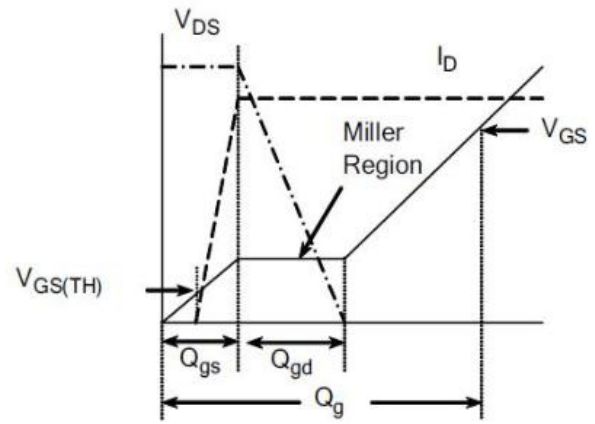
Fig 14: Max. Transient Thermal impedance



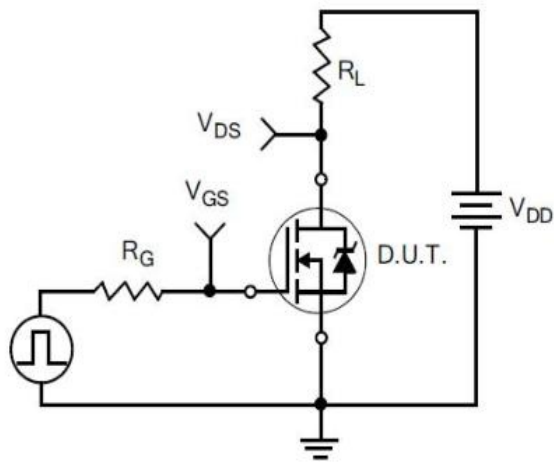
Typical Test Circuit



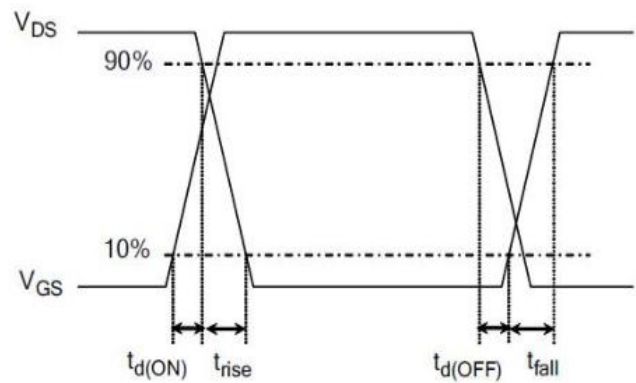
1) Gate Charge Test Circuit



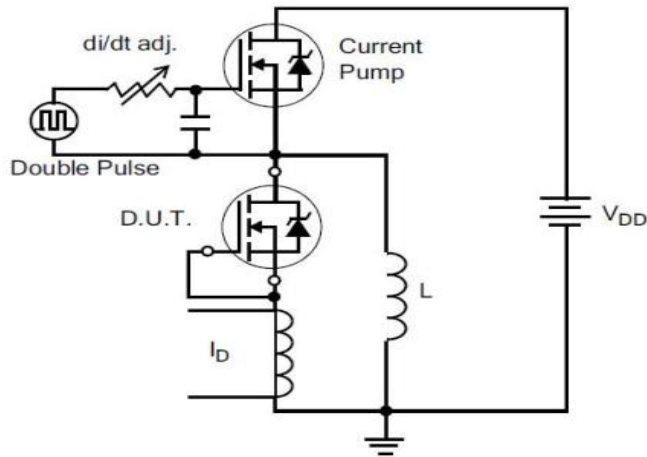
2) Gate Charge Waveform



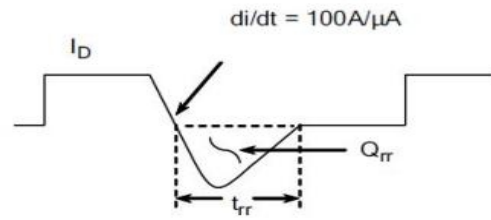
3) Resistive Switching Test Circuit



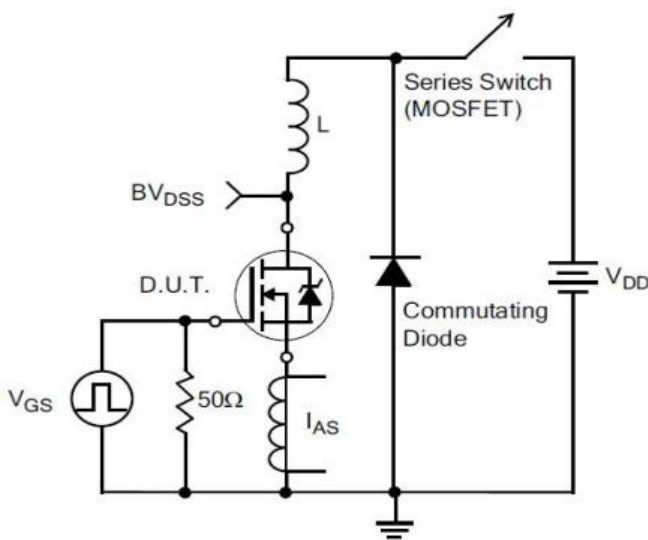
4) Resistive Switching Waveforms



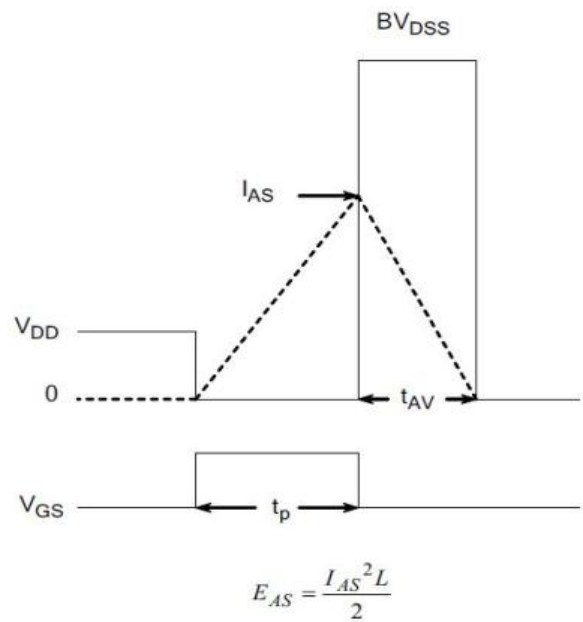
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform



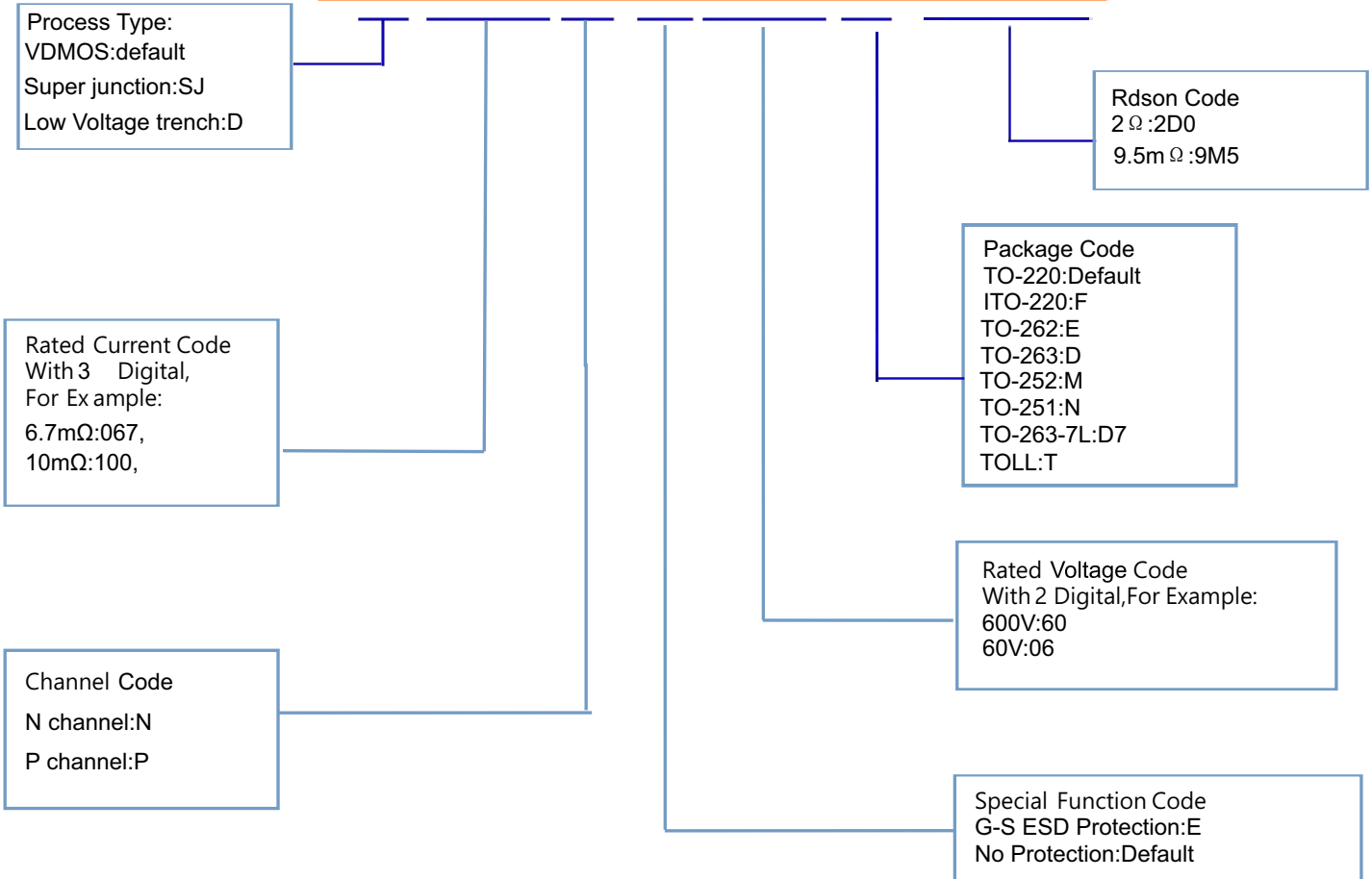
7) . Unclamped Inductive Switching Test Circuit



8) Unclamped Inductive Switching Waveforms

Product Names Rules

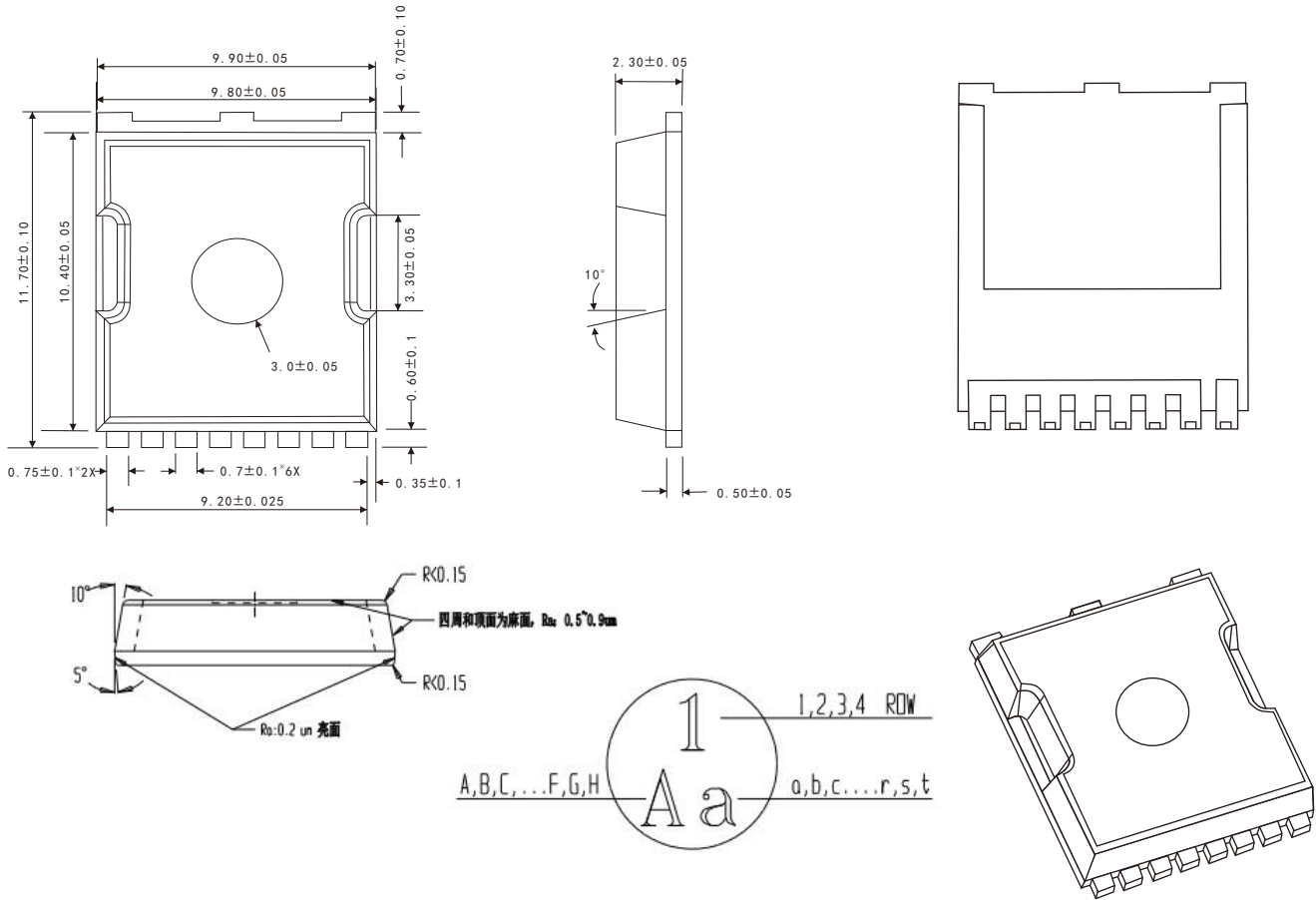
X X X N E X X X-X X X



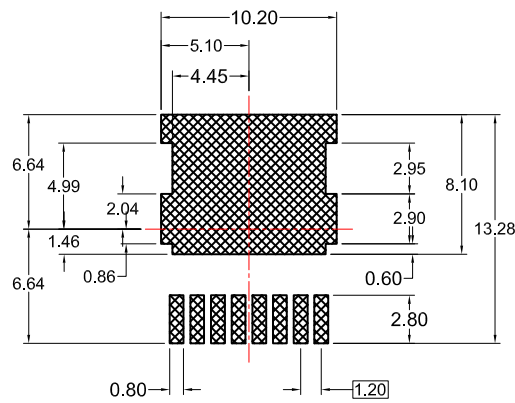


Dimensions

TOLL PACKAGE OUTLINE DIMENSIONS



Suggested Pad Layout



## Friendship Reminder

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