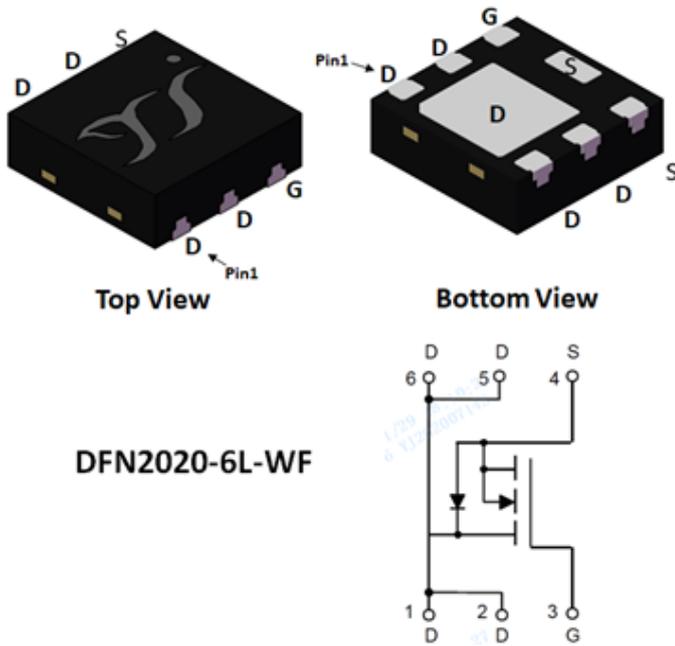


N-Channel Enhancement Mode Field Effect Transistor



Product Summary

• V_{DS}	20V
• I_D	27A
• $R_{DS(ON)}$ (at $V_{GS}=4.5V$)	< 15m Ω
• $R_{DS(ON)}$ (at $V_{GS}=2.5V$)	< 20m Ω
• $R_{DS(ON)}$ (at $V_{GS}=1.8V$)	< 30m Ω

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free
- Part no. with suffix "Q" means AEC-Q101 qualified

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC converter

Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V_{DS}	-	20	V
Gate-source Voltage			V_{GS}	-10	10	
Continuous Drain Current (Note 1,2)	Steady-State	$T_A=25^\circ\text{C}, V_{GS}=10V$	I_D	-	8.2	A
		$T_A=100^\circ\text{C}, V_{GS}=10V$		-	5.2	
Continuous Drain Current (Note 1,3)	Steady-State	$T_C=25^\circ\text{C}, V_{GS}=10V, \text{Chip limitation}$		-	27	
		$T_C=100^\circ\text{C}, V_{GS}=10V$		-	17	
Pulsed Drain Current	$T_C=25^\circ\text{C}, t_p \leq 10\mu\text{s}$		I_{DM}	-	108	
Maximum Body-Diode Continuous Current	$T_C=25^\circ\text{C}$		I_S		15	
Total Power Dissipation (Note 1,2)	Steady-State	$T_A=25^\circ\text{C}$	P_D	-	1.6	W
		$T_A=100^\circ\text{C}$		-	0.6	
Total Power Dissipation (Note 1,3)	Steady-State	$T_C=25^\circ\text{C}$		-	17	
		$T_C=100^\circ\text{C}$		-	6.8	
Junction and Storage Temperature Range			T_J, T_{STG}	-55	150	$^\circ\text{C}$

Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	78	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	7.3	

Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJQT015N02AQ	F1	015N02	3000	30000	120000	7" reel



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■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A, T_j=25^\circ C$	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V, T_j=25^\circ C$	-	-	1	μA
		$V_{DS}=20V, V_{GS}=0V, T_j=125^\circ C$	-	-	100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V, T_j=25^\circ C$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A, T_j=25^\circ C$	0.4	0.7	1	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=9A, T_j=25^\circ C$	-	12	15	$m\Omega$
		$V_{GS}=2.5V, I_D=5A, T_j=25^\circ C$	-	15	20	$m\Omega$
		$V_{GS}=1.8V, I_D=2.5A, T_j=25^\circ C$	-	21	30	$m\Omega$
Diode Forward Voltage	V_{SD}	$I_S=9A, V_{GS}=0V, T_j=25^\circ C$	-	0.84	1.2	V
Gate Resistance	R_G	$f=1MHz, T_j=25^\circ C$	-	2.4	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, f=1MHz, T_j=25^\circ C$	-	680	-	pF
Output Capacitance	C_{oss}		-	115	-	
Reverse Transfer Capacitance	C_{riss}		-	105	-	
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=4.5V, V_{DS}=10V, I_D=9A, T_j=25^\circ C$	-	9	-	nC
Gate-Source Charge	Q_{gs}		-	0.5	-	
Gate-Drain Charge	Q_{gd}		-	2.4	-	
Reverse Recovery Charge	Q_{rr}	$I_F=9A, di/dt=100A/\mu s, V_{GS}=0V, V_R=10V, T_j=25^\circ C$	-	1.8	-	nC
Reverse Recovery Time	t_{rr}		-	439	-	ns
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=4.5V, V_{DS}=10V, I_D=9A, R_{GEN}=3\Omega, T_j=25^\circ C$	-	12	-	ns
Turn-on Rise Time	t_r		-	51	-	
Turn-off Delay Time	$t_{D(off)}$		-	30	-	
Turn-off Fall Time	t_f		-	10	-	

Note:

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in² pad of 2oz. Copper, in the still air environment with $T_A=25^\circ C$. The maximum allowed junction temperature of $150^\circ C$. The value in any given application depends on the user's specific board design.
- Thermal resistance from junction to soldering point (on the exposed drain pad).



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Typical Electrical and Thermal Characteristics Diagrams

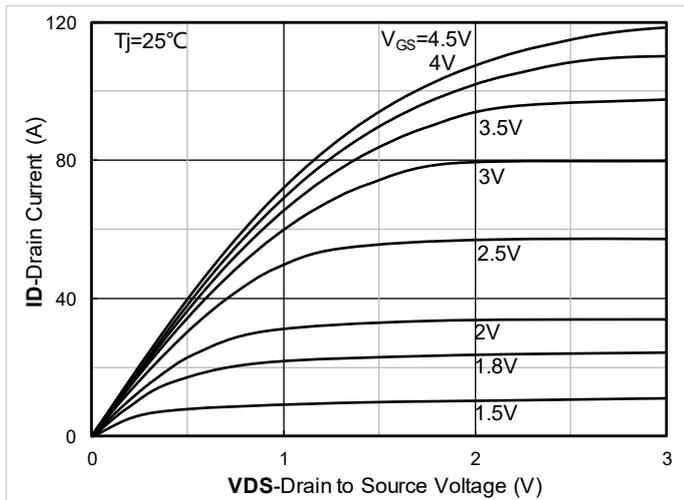


Figure 1. Output Characteristics; typical values

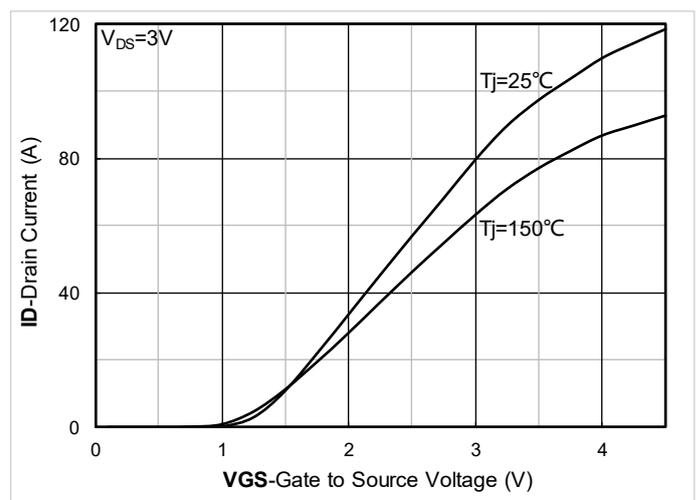


Figure 2. Transfer Characteristics; typical values

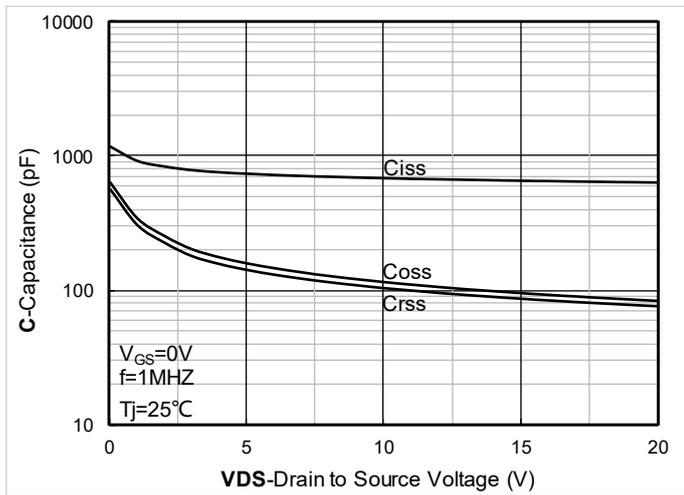


Figure 3. Capacitance Characteristics; typical values

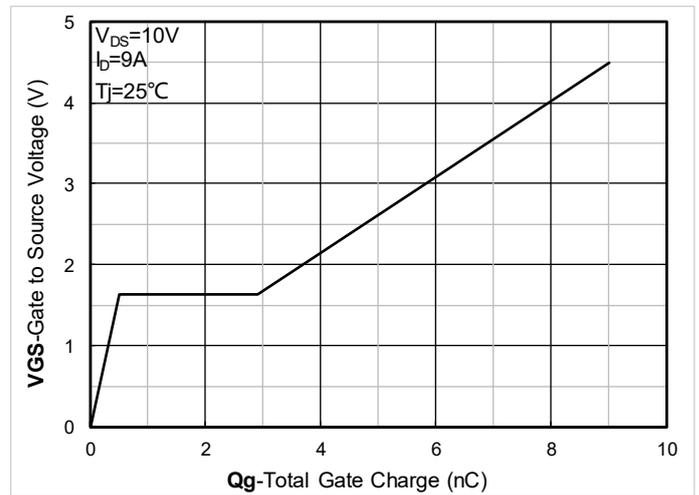


Figure 4. Gate Charge; typical values

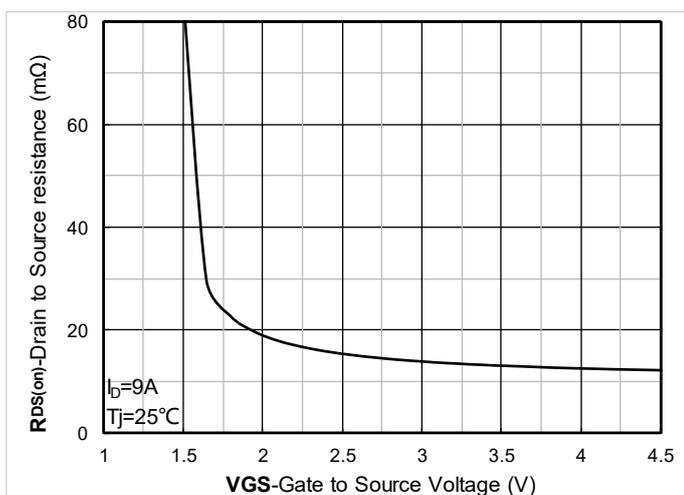


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

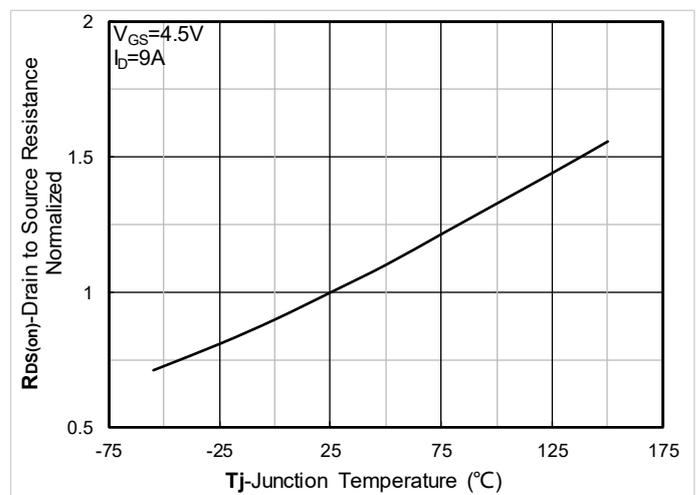


Figure 6. Normalized On-Resistance



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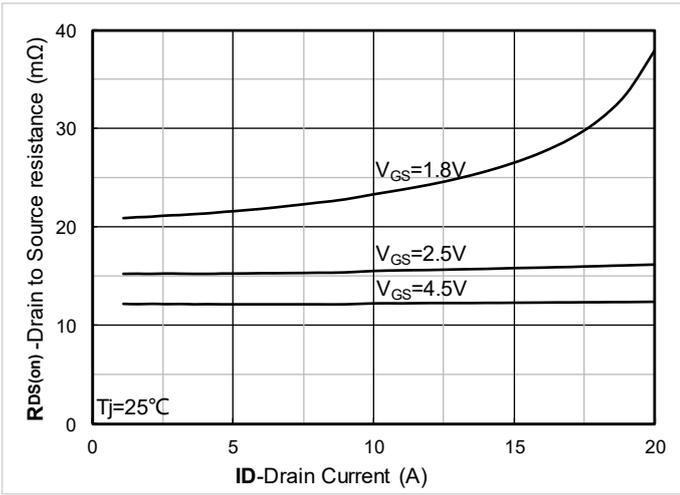


Figure 7. RDS(on) vs. Drain Current; typical values

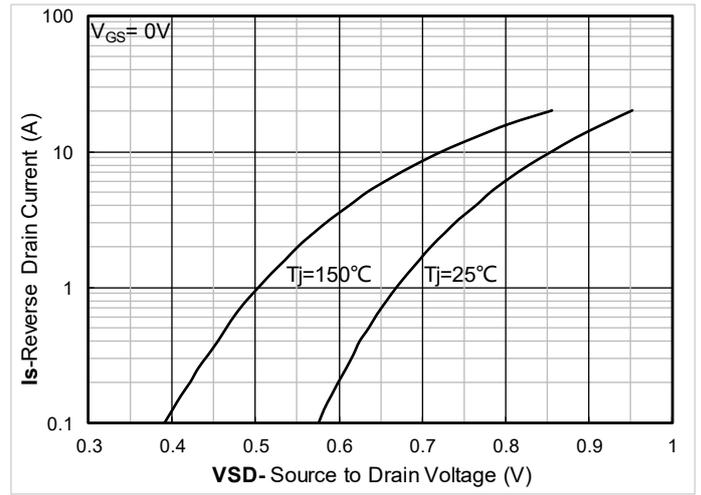


Figure 8. Forward characteristics of reverse diode; typical values

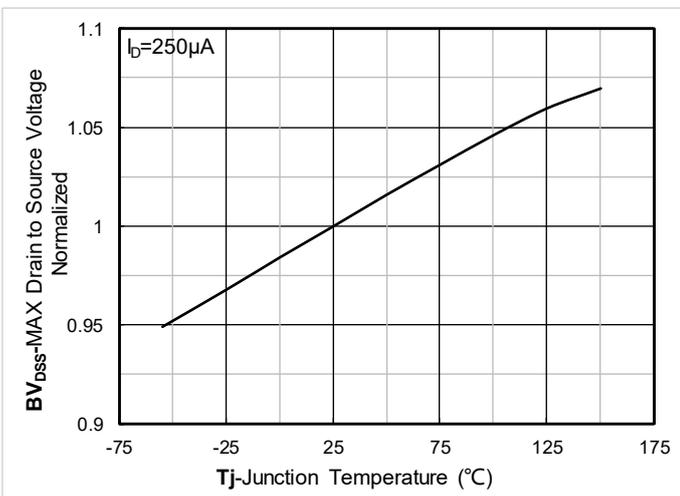


Figure 9. Normalized breakdown voltage

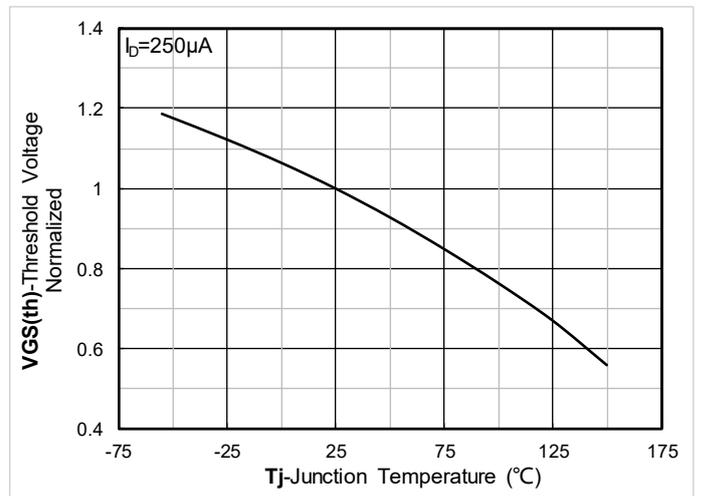


Figure 10. Normalized Threshold voltage

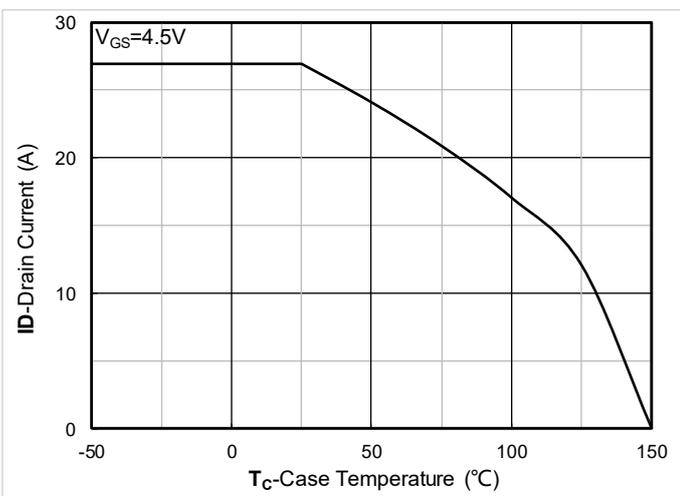


Figure 11. Current dissipation

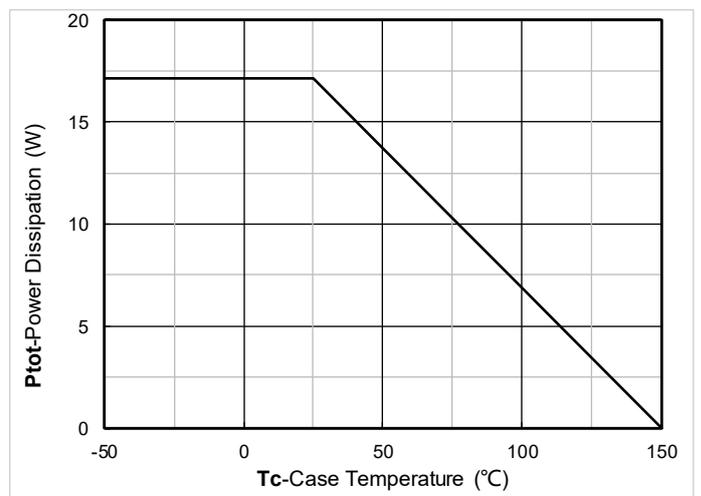


Figure 12. Power dissipation



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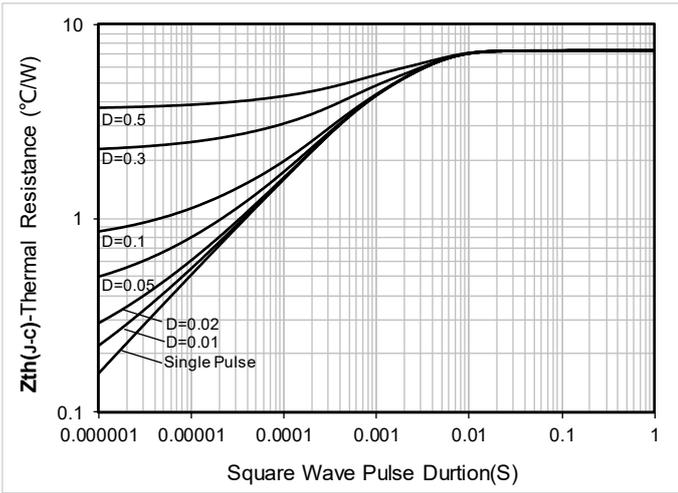


Figure 13. Maximum Transient Thermal Impedance

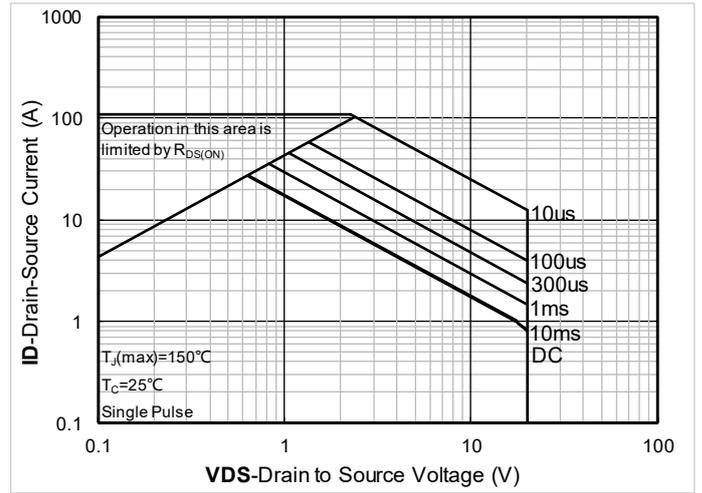


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

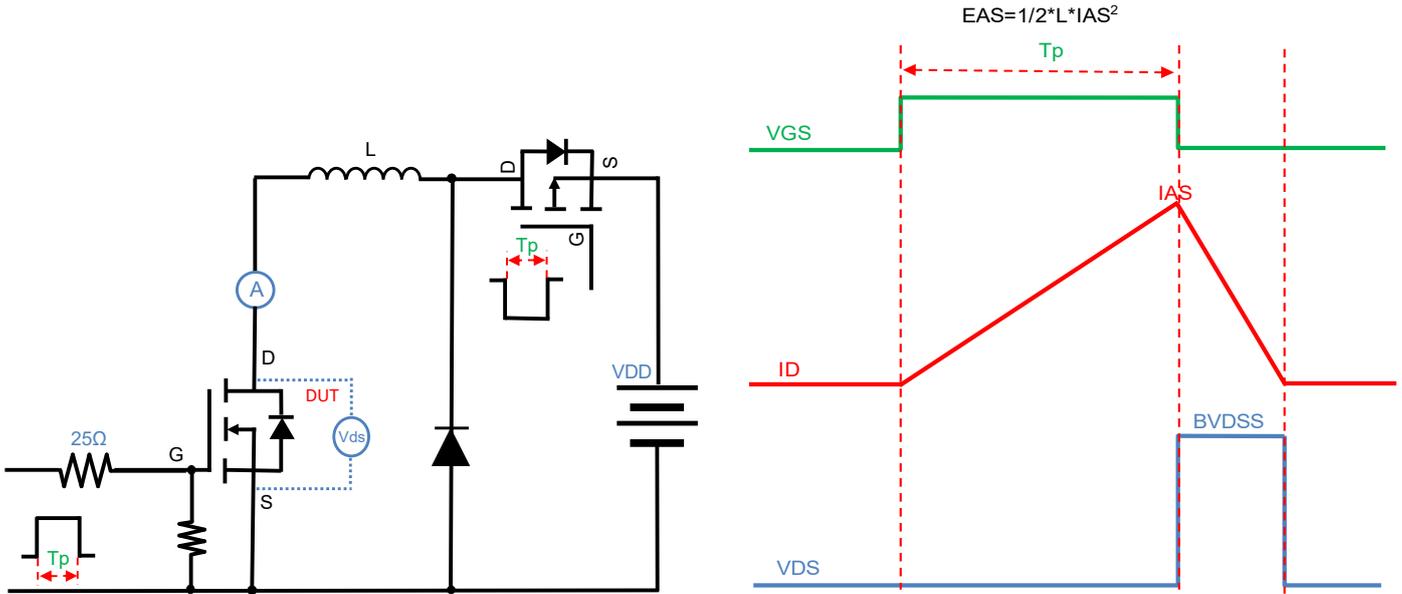


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

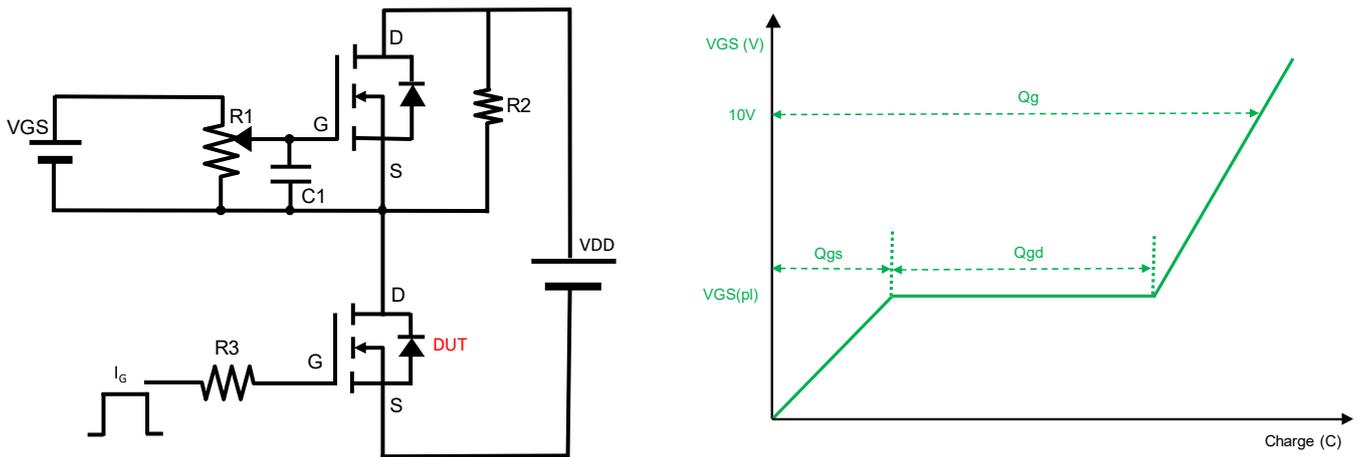


Figure B. Gate Charge Test Circuit & Waveform

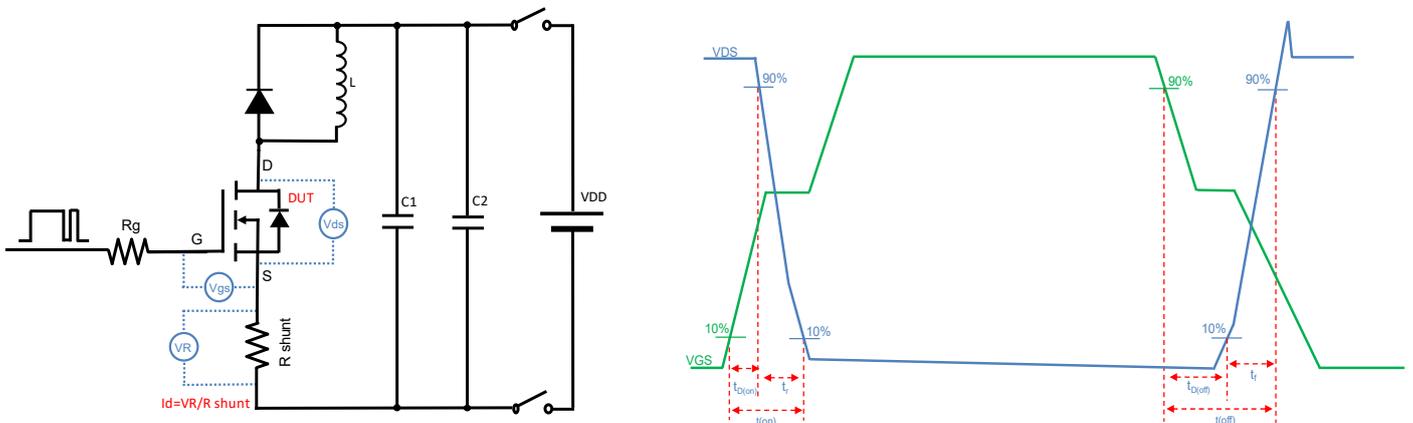


Figure C. Resistive Switching Test Circuit & Waveform

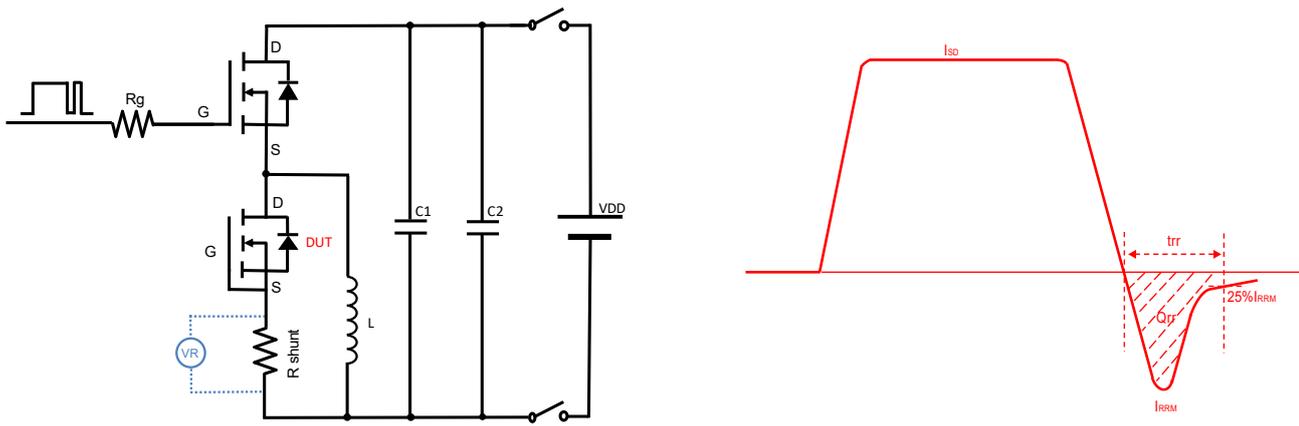
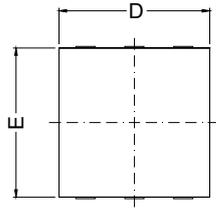


Figure D. Diode Recovery Test Circuit & Waveform

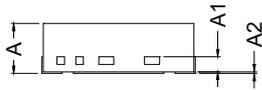


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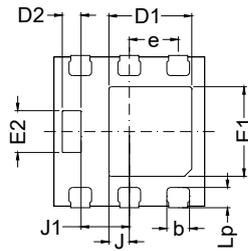
■ DFN2020-6L-H-0.65MM Package Information



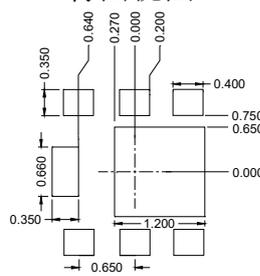
Top View
正面视图



Side View
侧面视图



Bottom View
背面视图



Suggested Solder Pad Layout
Top View

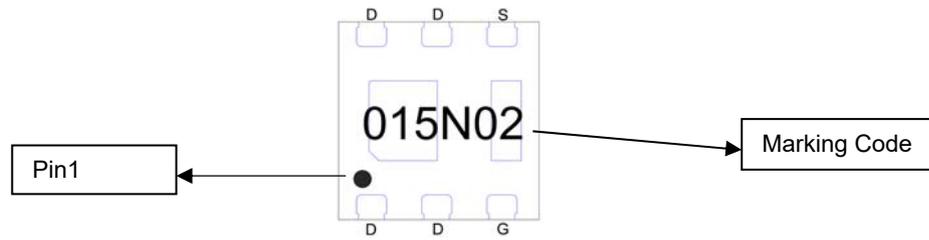
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	1.90	2.00	2.10
E	1.90	2.00	2.10
A	0.55	0.65	0.75
A1	0.20 BSC		
A2	0	-	0.10
D1	1.00	1.10	1.20
D2	0.20	0.25	0.35
E1	1.10	1.20	1.30
E2	0.51	0.56	0.66
Lp	0.20	0.25	0.35
J	0.27 BSC		
J1	0.64 BSC		
b	0.20	0.30	0.40
e	0.65 BSC		

Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.10 mm.
3. The pad layout is for reference purposes only.



■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. 015N02 is marking code
4. Body color: Black



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