



N-Channel and N-Channel Complementary MOSFET

Product Summary

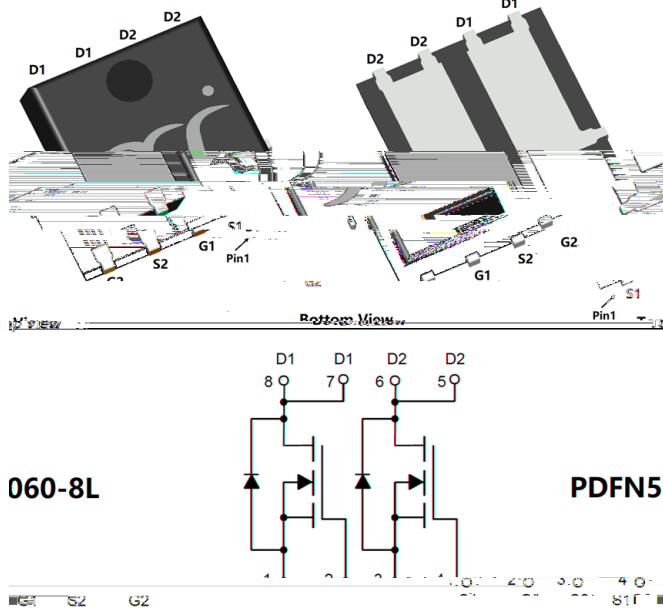
V_{DS}	100V
I_D	20A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	19m
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	23m
100% EAS Tested	
100% V_{DS} Tested	

General Description

Split gate trench MOSFET technology
High density cell design for low $R_{DS(ON)}$
High Speed switching
Moisture Sensitivity Level 1
Epoxy Meets UL 94 V-0 Flammability Rating
Halogen Free

Applications

DC-DC Converters
Power management functions
Industrial and Motor Drive application

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	100	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_A=25$	I_D	6.5	A
	$T_A=100$		4	
	$T_C=25$		20	
	$T_C=100$		12.5	
Pulsed Drain Current ^A		I_{DM}	80	A
Avalanche energy ^B		EAS	72	mJ
Total Power Dissipation ^C	$T_A=25$	P_D	2	W
	$T_A=100$		0.8	
	$T_C=25$		69	
	$T_C=100$		27	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 +150	

Thermal resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient ^D	Steady-State	R	50	60	/W
Thermal Resistance Junction-to-Case	Steady-State	R	1.5	1.8	

Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJGD20G10B	F1	YJGD20G10B	5000	10000	100000	13 reel



YJGD20G10B

Electrical Characteristics (T_J=25 unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D	100	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V	-	-	1	
		V _{DS} =100V, V _{GS} =0V, T _J =150	-	-	100	
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D	1.0	1.8	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	15	19	
		V _{GS} =4.5V, I _D =7A	-	18	23	
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V	-	-	1.2	V
Gate resistance	R _G	f=1MHz	-	1.5	-	
Maximum Body-Diode Continuous Current	I _S		-	-	20	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz	-	1150	-	pF
Output Capacitance	C _{oss}		-	430	-	
Reverse Transfer Capacitance	C _{rss}		-	8	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =20A	-	20	-	nC
Gate-Source Charge	Q _{gs}		-	5.6	-	
Gate-Drain Charge	Q _{gd}		-	2.8	-	
Reverse Recovery Charge	Q _{rr}	I _F =20A, di/dt=100A/us	-	32	-	nC
Reverse Recovery Time	t _{rr}		-	41	-	ns
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =50V, I _D =20A R _{GEN} =3	-	7	-	ns
Turn-on Rise Time	t _r		-	29	-	
Turn-off Delay Time	t _{D(off)}		-	18	-	
Turn-off fall Time	t _f		-	7	-	

A. Repetitive rating; pulse width limited by max. junction temperature.

B. T_J=25 , V_G=10V, R_G 0.5mH, I_{AS}=17A.

C. P_d is based on max. junction temperature, using junction-case thermal resistance.

D. The value of R is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in the still air environment with T_A =25 .
The maximum allowed junction temperature of 150 . The value in any given application depends on the user's specific board design.



Typical Electrical and Thermal Characteristics Diagrams

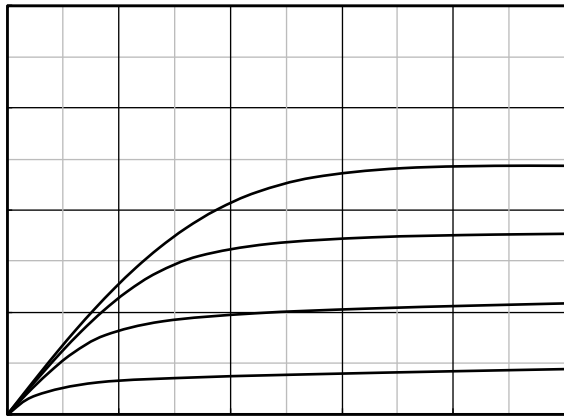


Figure 1. Output Characteristics

Figure

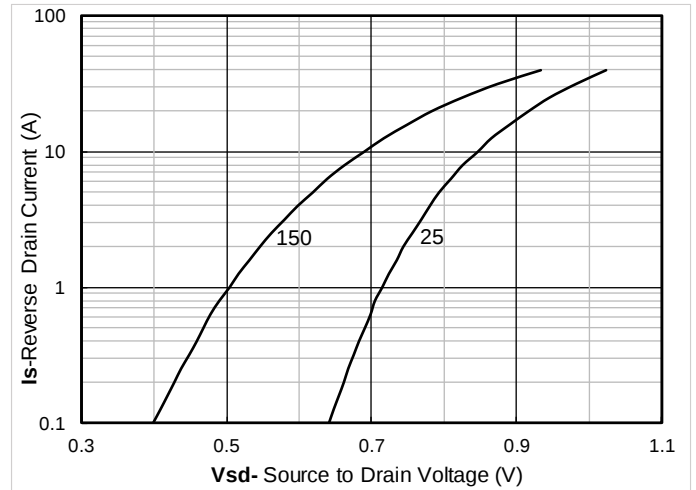


Figure 8. Forward characteristics of reverse diode

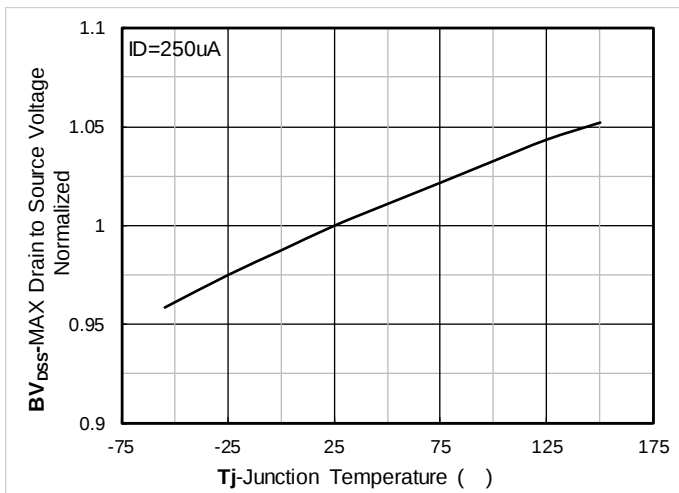


Figure 9. Normalized breakdown voltage

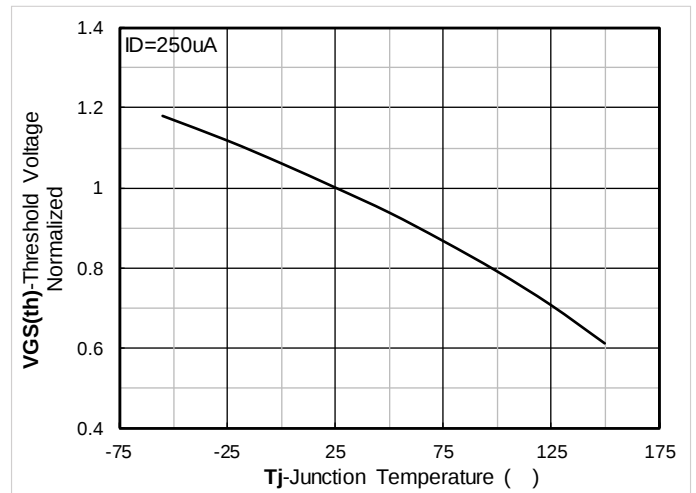


Figure 10. Normalized Threshold voltage

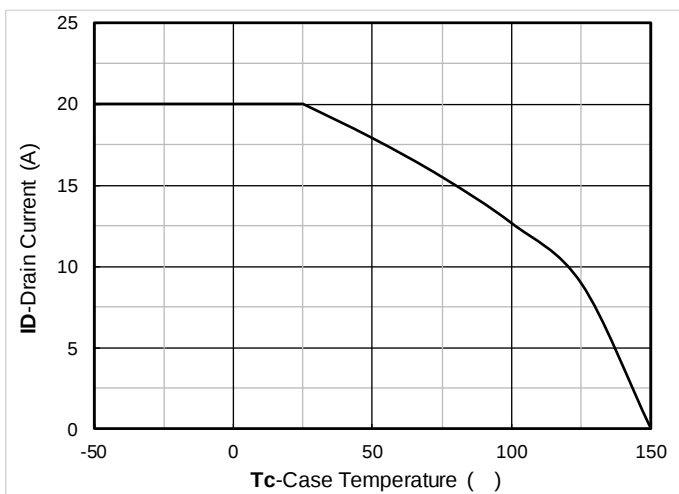


Figure 11. Current dissipation

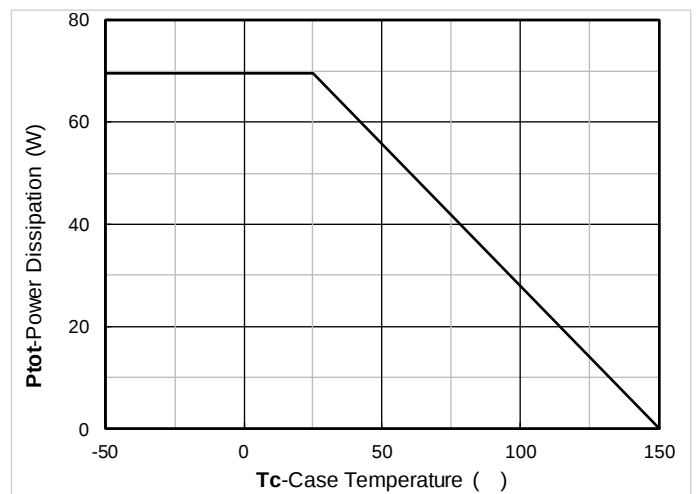


Figure 12. Power dissipation

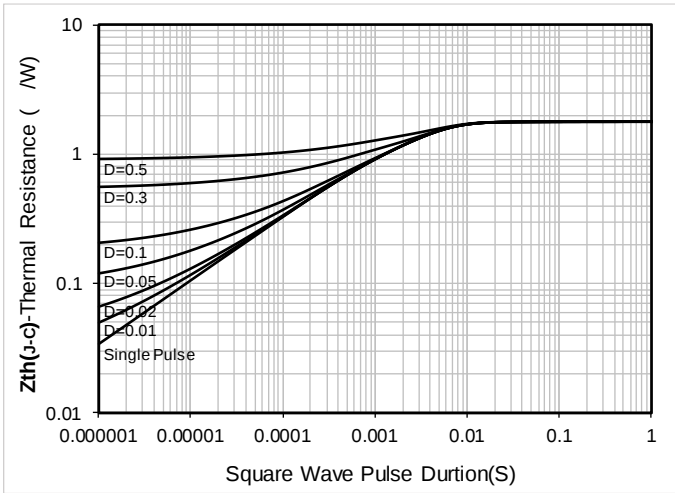


Figure 13. Maximum Transient Thermal Impedance

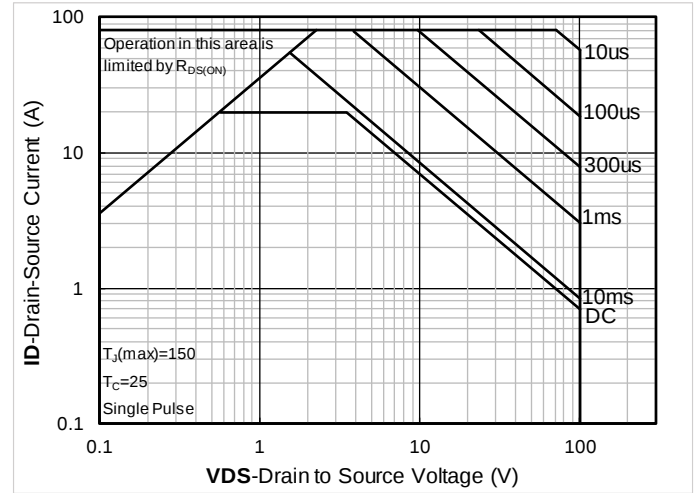


Figure 14. Safe Operation Area

Test Circuits & Waveforms

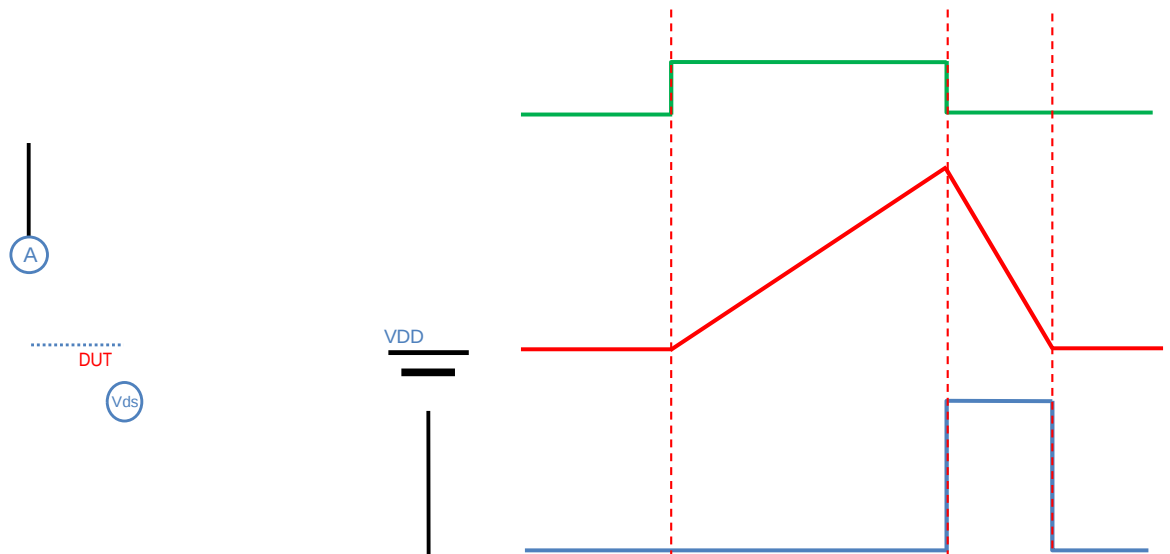


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform



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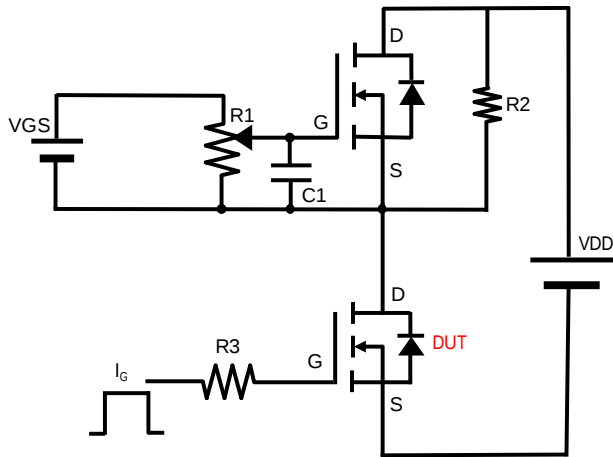


Figure B. Gate Charge Test Circuit & Waveform

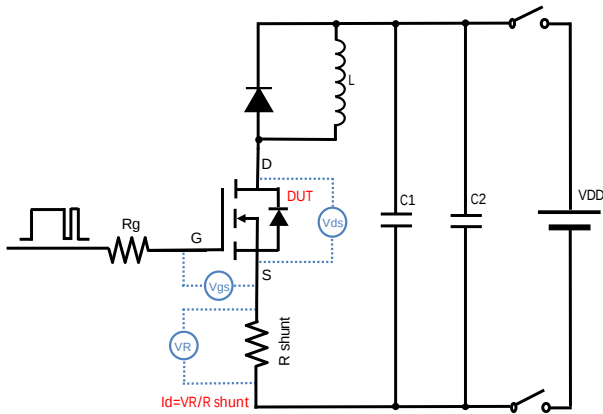


Figure C. Resistive Switching Test Circuit & Waveform

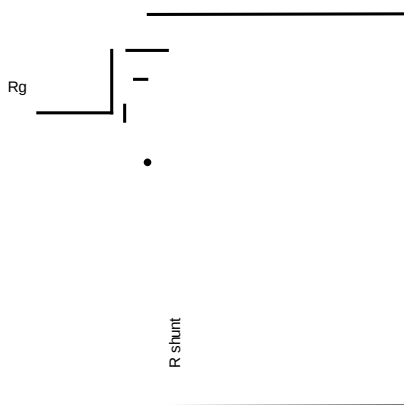
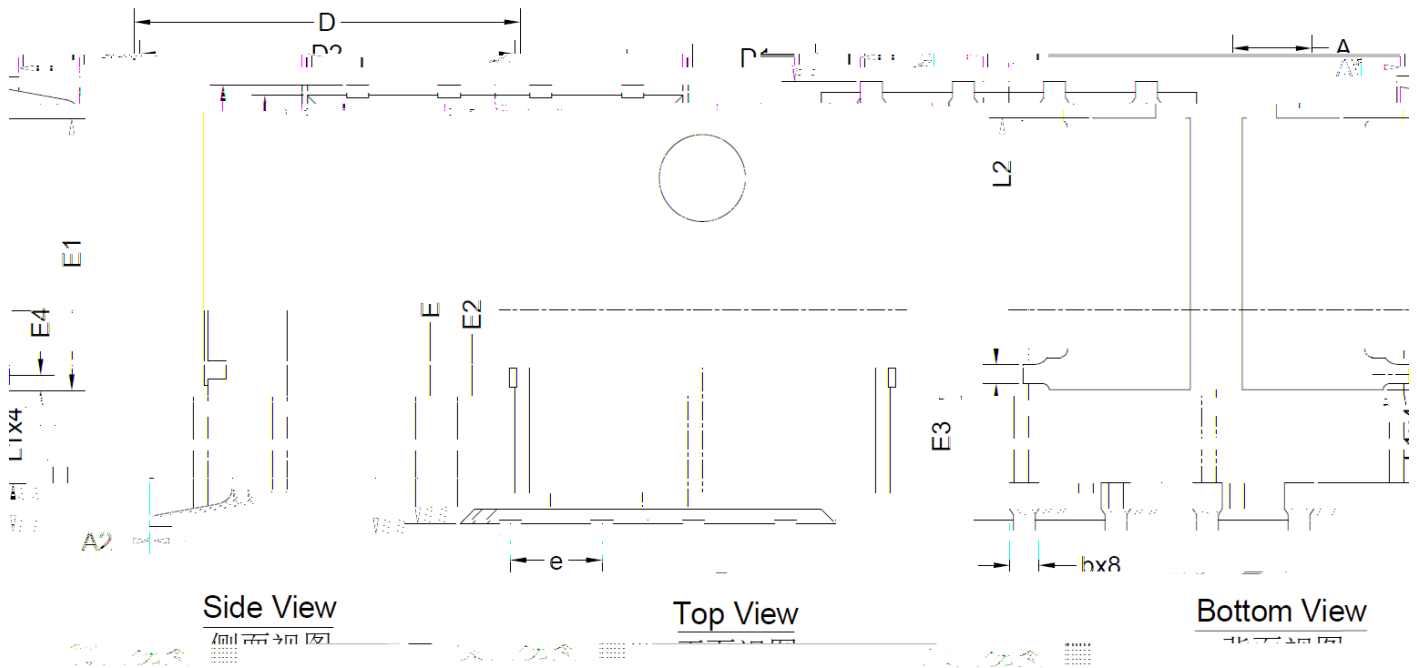


Figure D. Diode Recovery Test Circuit & Waveform



YJGD20G10B

PDFN5060-8L-E-1.1mm Package information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
D	5.15	5.35	5.55
D3	5.05	5.15	5.35
A	1.00	1.10	1.20
A1	0.254 BSC		
A2	0.10		
D1	1.50	1.70	1.90
E1	3.52	3.72	3.92
D2	5.00	5.20	5.40
E2	5.66	5.86	6.06
E3	0.254 REF		
E4	0.21 REF		
L1	0.56	0.66	0.76
L2	1.27 BSC		
b	0.31	0.41	0.51
c	1.27 BSC		

Note:
1 Controlling dimension in millimeters.
2 General tolerance: 0.1mm.

