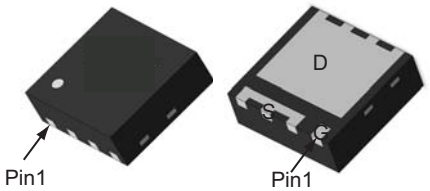
N-Channel MOSFET

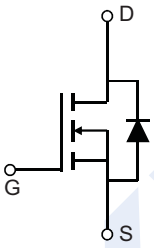
2SK3050DFN

DFN2x2C-8L



■ Features

- V_{DS} = 100 V
- I_D (at V_{GS} = 10 V) = 8 A
- $R_{DS(ON)}$ (at V_{GS} = 10 V) < 32 mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5 V) < 39 mΩ



■ Absolute Maximum Ratings (T_A = 25℃ unless otherwise noted)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_A=25℃	I_D	8	A
	T_A=70℃		6	
Pulsed Drain Current [C]		I_{DM}	32	
Power Dissipation [B]	T_A=25℃	P_D	4.1	W
	T_A=70℃		2.6	
Thermal Resistance.Junction- to-Ambient [A]	t ⩽ 10s	R_{thJA}	30	℃/W
Thermal Resistance.Junction- to-Ambient [A D]	Steady-State		55	
Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{stg}	-55 to 150	

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■ Electrical Characteristics (T_J = 25℃ unless othewise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	I_D = 250 μA, V_{GS} = 0V	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100 V, V_{GS} = 0 V			1	μA
		V_{DS} = 100 V, V_{GS} = 0 V, T_J = 55 ℃			5	
Gate to Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250μA	1.4		2.4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 8 A			32	mΩ
		V_{GS} = 10 V, I_D = 8 A, T_J = 125 ℃			57	
		V_{GS} = 4.5 V, I_D = 6 A			39	
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 8 A		25		S
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz		840		pF
Output Capacitance	C_{oss}			64		
Reverse Transfer Capacitance	C_{rss}			4		
Gate Resistance	R_g	V_{GS} = 0 V, V_{DS} = 0 V, f = 1 MHz		1.4		Ω
Total Gate Charge	Q_g(10V)	V_{GS} = 10V, V_{DS} = 50 V, I_D = 8 A		12.8	25	nC
Total Gate Charge	Q_g(4.5V)			6.1	12	
Gate Source Charge	Q_{gs}			2.1		
Gate Drain Charge	Q_{gd}			1.8		
Output Charge	Q_{oss}	V_{GS}=0V, V_{DS}=50V		11		
Turn-On DelayTime	$t_{d(on)}$	V_{GS} = 10V, V_{DS} = 50 V, R_L = 5.85 Ω, R_{GEN} = 3 Ω		7		ns
Turn-On Rise Time	t_r			8		
Turn-Off DelayTime	$t_{d(off)}$			24		
Turn-Off Fall Time	t_f			3		
Body Diode Reverse Recovery Time	t_{rr}	I_F = 8 A, dI/dt = 500 A/μs		20		
Body Diode Reverse Recovery Charge	Q_{rr}			70		nC
Maximum Body-Diode Continuous Current	I_S				5	A
Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 1 A			1	V

Notes:

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using ≤10s junction-to-case thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C

D. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and case to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in^2 FR-4 board with 2oz Copper, assuming a maximum junction temperature of $T_{J(MAX)}$=150°C. The SOA curve provides a single pulse rating.

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■ Typical Electrical and Thermal Characteristics

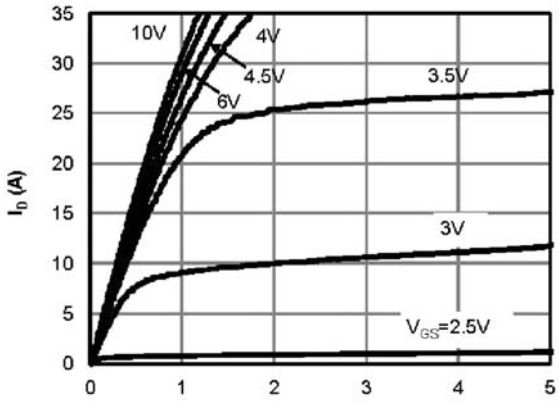

Figure 1: On-Region Characteristics (Note E)

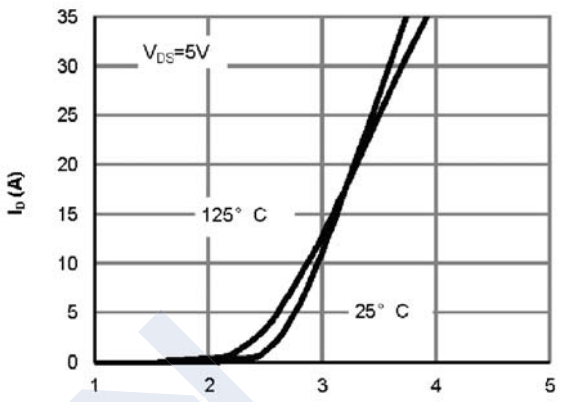

Figure 2: Transfer Characteristics (Note E)

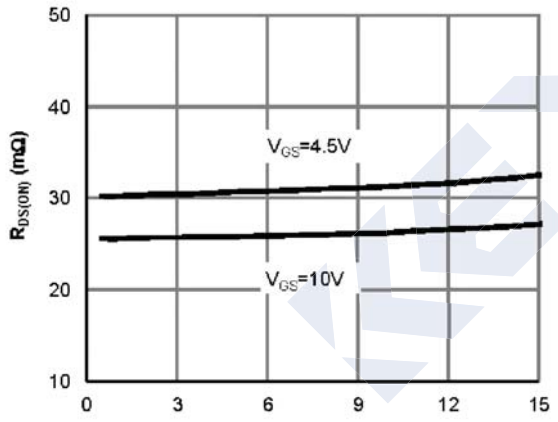

Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

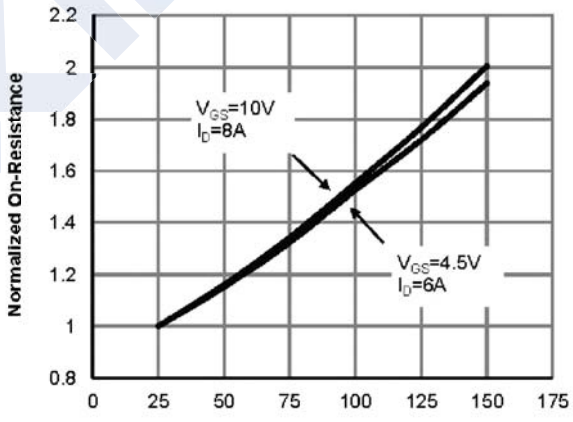

Figure 4: On-Resistance vs. Junction Temperature (Note E)

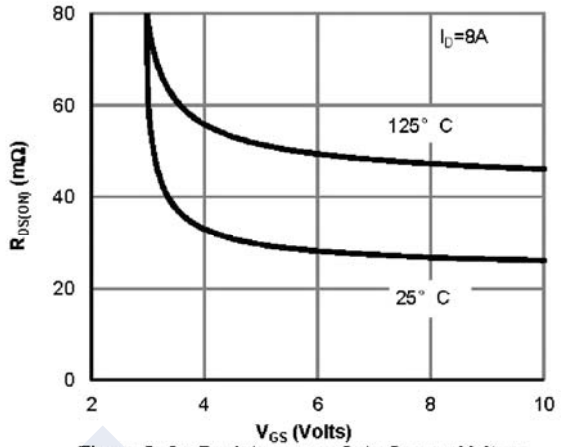

Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

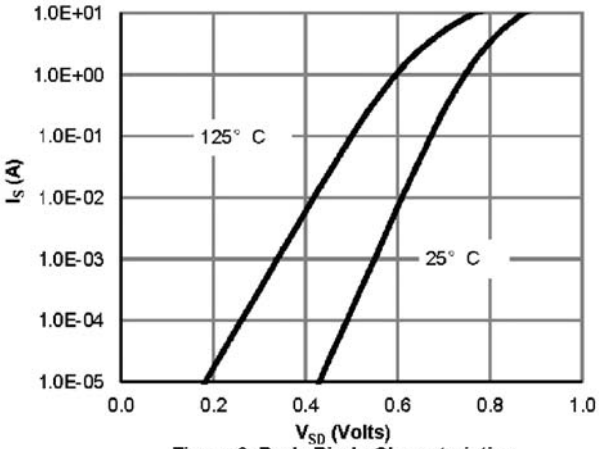

Figure 6: Body-Diode Characteristics (Note E)

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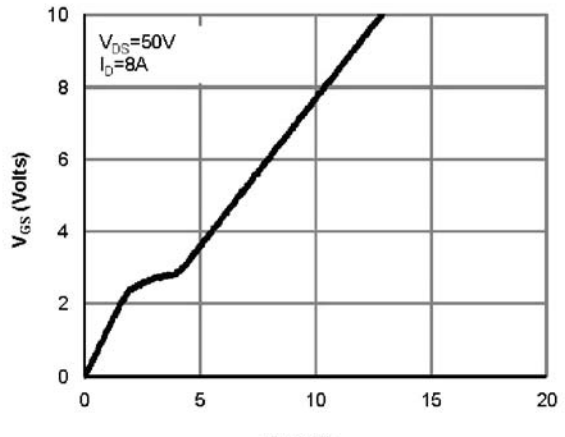

Figure 7: Gate-Charge Characteristics

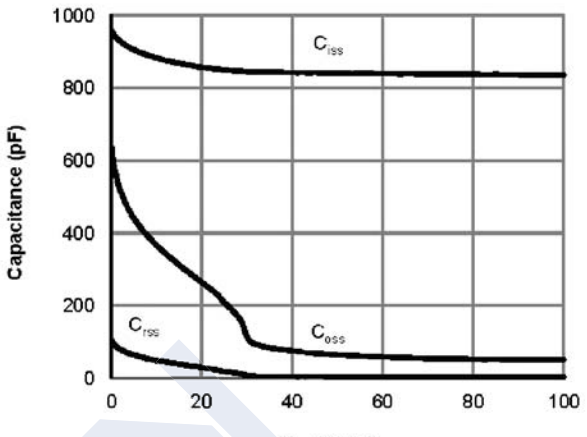

Figure 8: Capacitance Characteristics

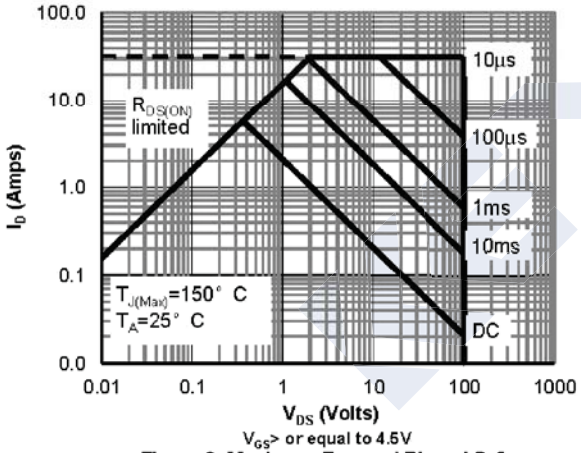

Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

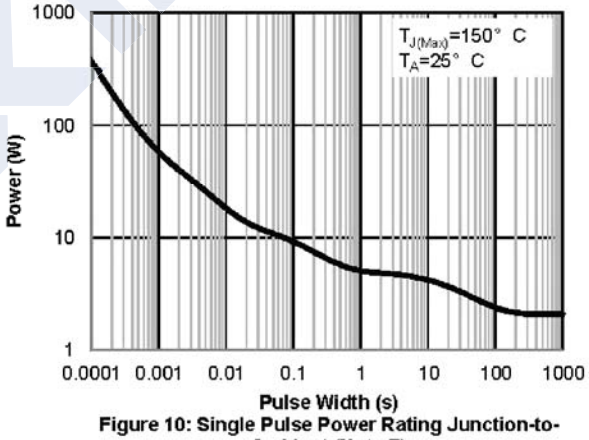

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

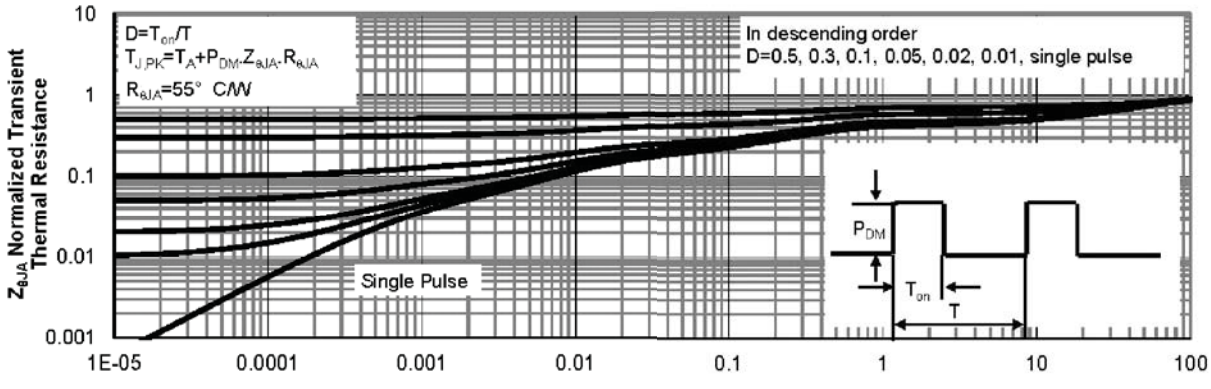

Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

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Figure A: Gate Charge Test Circuit & Waveforms

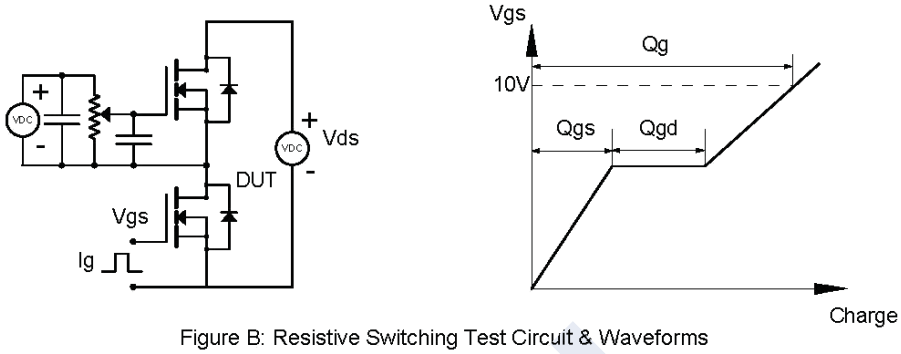


Figure B: Resistive Switching Test Circuit & Waveforms

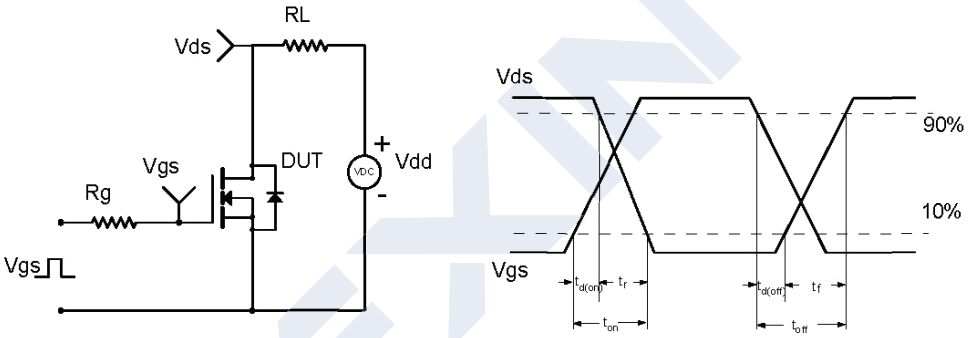


Figure C: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

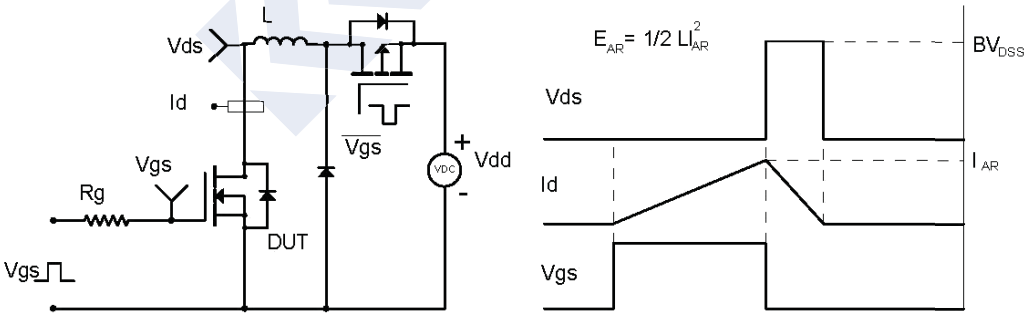
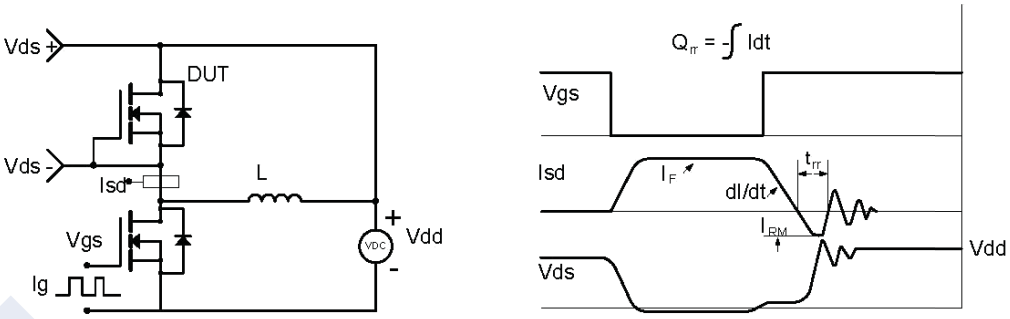


Figure D: Diode Recovery Test Circuit & Waveforms



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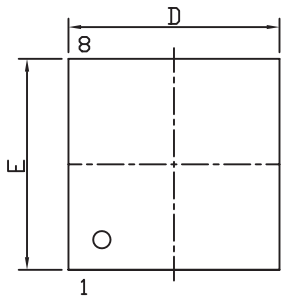
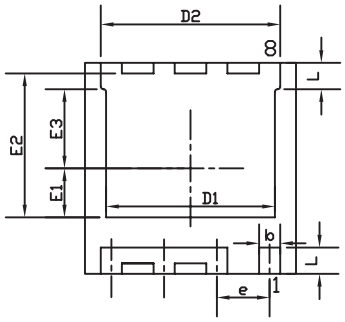
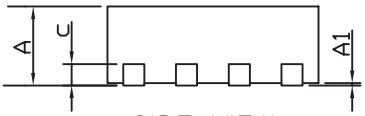
■ DFN2x2C-8L Package Outline Dimensions



TOP VIEW

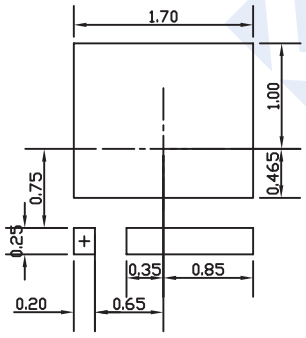


BOTTOM VIEW



SIDE VIEW

RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.032
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.15	0.20	0.25	0.006	0.008	0.010
c	--	0.20 Ref	--	--	0.008 Ref	--
D	1.90	2.00	2.10	0.075	0.079	0.083
D1	1.50	1.60	1.70	0.059	0.063	0.067
D2	1.60	1.70	1.80	0.063	0.067	0.071
E	1.90	2.00	2.10	0.075	0.079	0.083
E1	0.415	0.465	0.515	0.016	0.018	0.020
E2	1.265	1.365	1.465	0.050	0.054	0.058
E3	0.700	0.750	0.800	0.028	0.030	0.032
e	0.50 BSC			0.020 BSC		
L	0.20	0.25	0.30	0.008	0.010	0.012

NOTE

1. CONTROLLING DIMENSION IS MILLIMETER.
   CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.