

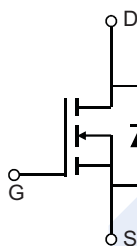
N-Channel MOSFET

2SK3050DFN

■ Features

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

DFN2x2C-8L

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

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

N-Channel MOSFET

2SK3050DFN

■ Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

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

Notes:

- A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The value in any given application depends on the user's specific board design.
- B. The power dissipation P_D is based on $T_{J(MAX)}=150^\circ\text{C}$, using $\leq 10\text{s}$ junction-to-case thermal resistance.
- C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$
- 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 $<300\ \mu\text{s}$ 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 1in² FR-4 board with 2oz Copper, assuming a maximum junction temperature of $T_{J(MAX)}=150^\circ\text{C}$. The SOA curve provides a single pulse rating.

N-Channel MOSFET

2SK3050DFN

■ Typical Electrical and Thermal Characteristics

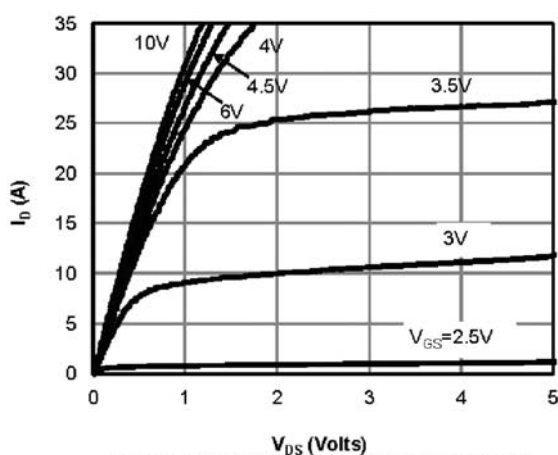


Figure 1: On-Region Characteristics (Note E)

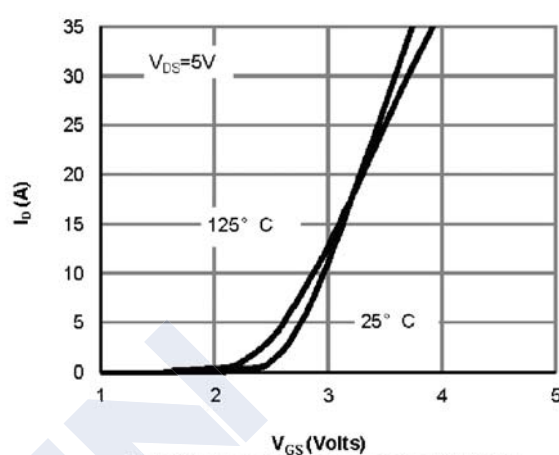


Figure 2: Transfer Characteristics (Note E)

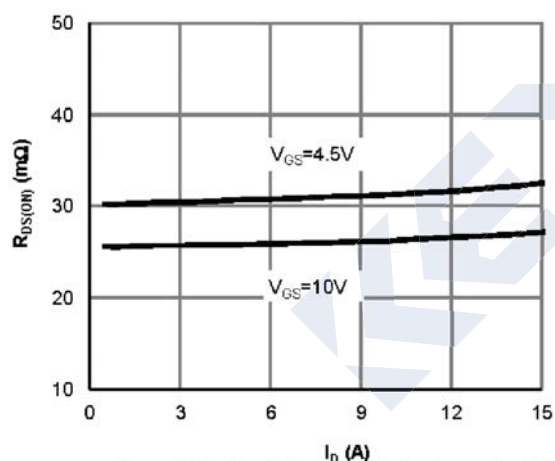


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

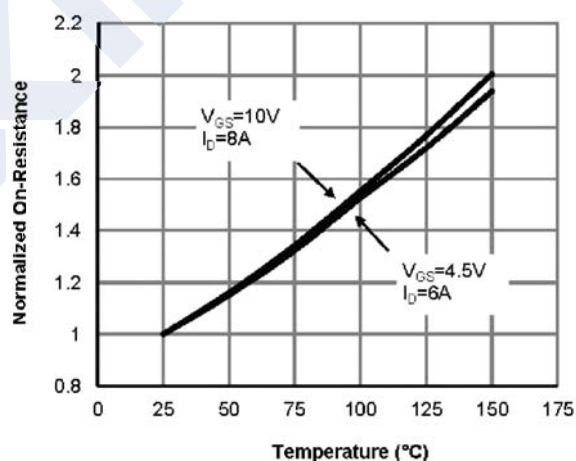


Figure 4: On-Resistance vs. Junction Temperature (Note E)

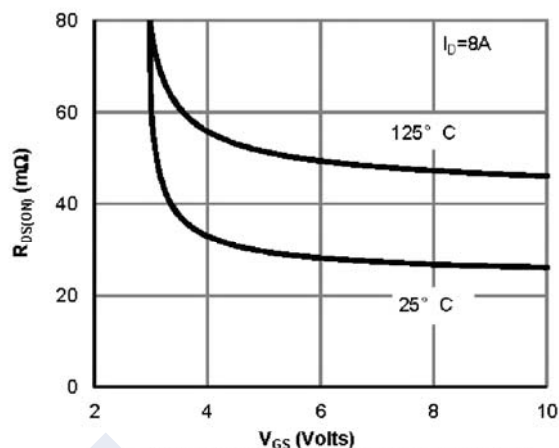


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

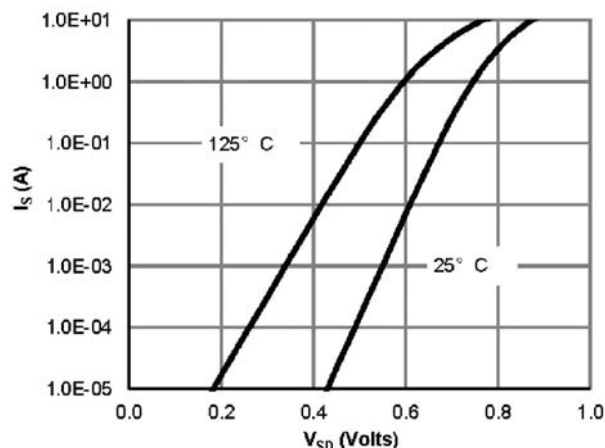


Figure 6: Body-Diode Characteristics (Note E)

N-Channel MOSFET

2SK3050DFN

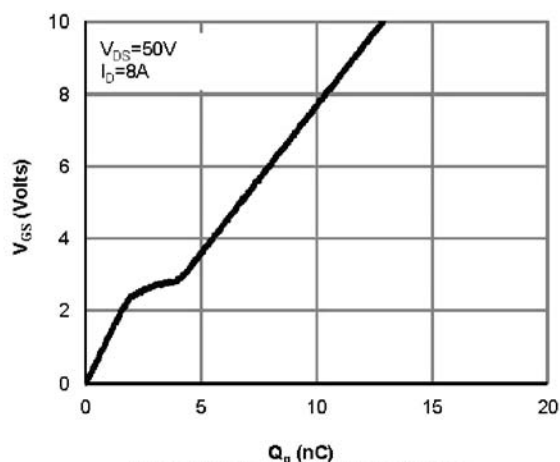


Figure 7: Gate-Charge Characteristics

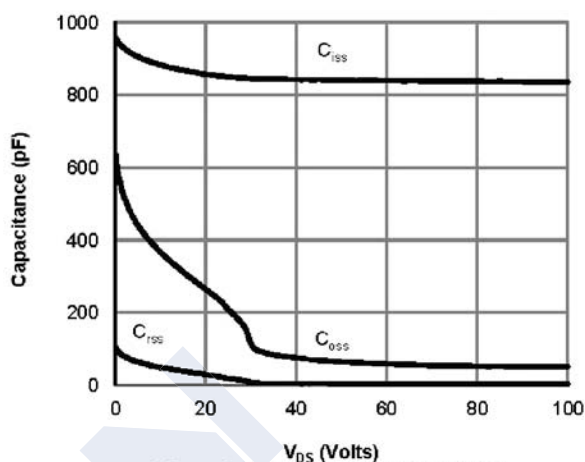


Figure 8: Capacitance Characteristics

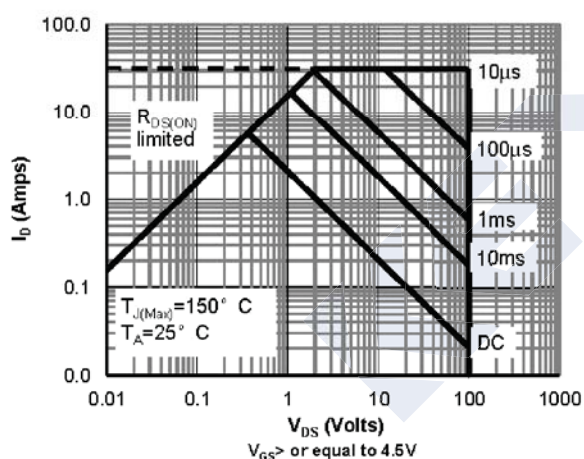


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

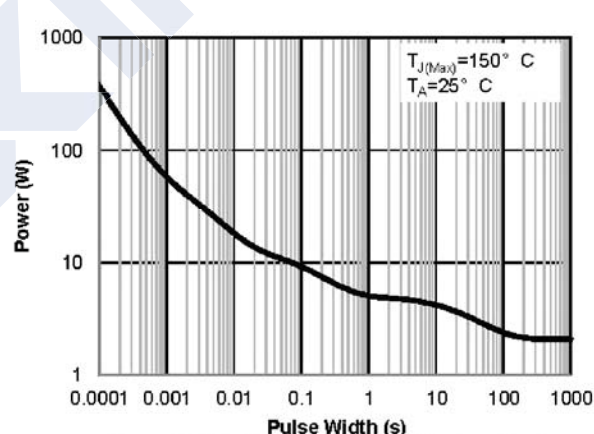


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

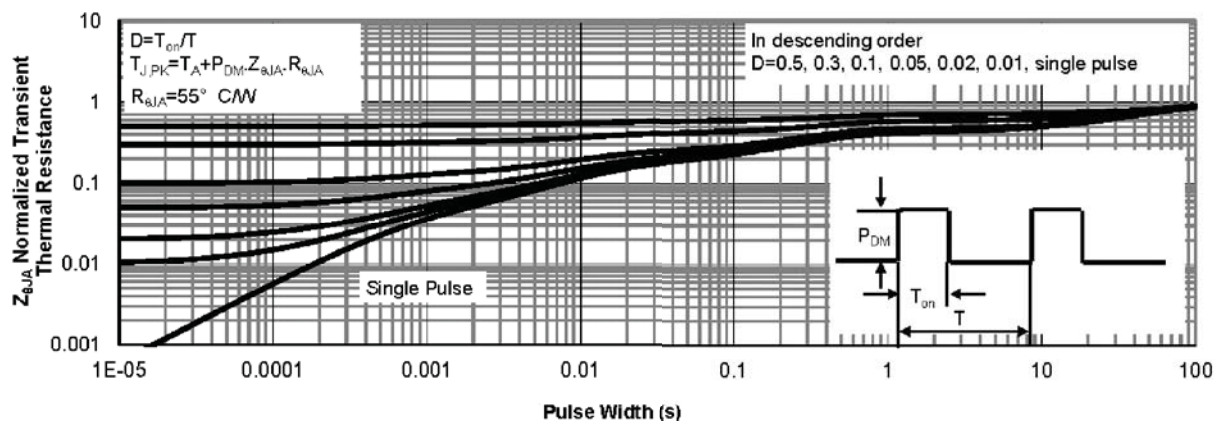


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

N-Channel MOSFET

2SK3050DFN

Figure A: Gate Charge Test Circuit & Waveforms

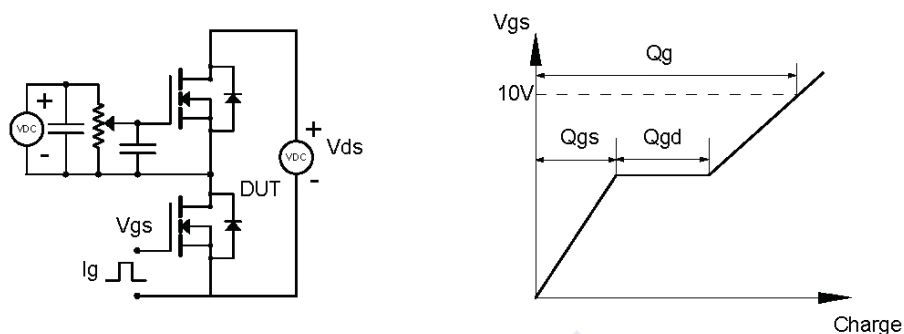


Figure B: Resistive Switching Test Circuit & Waveforms

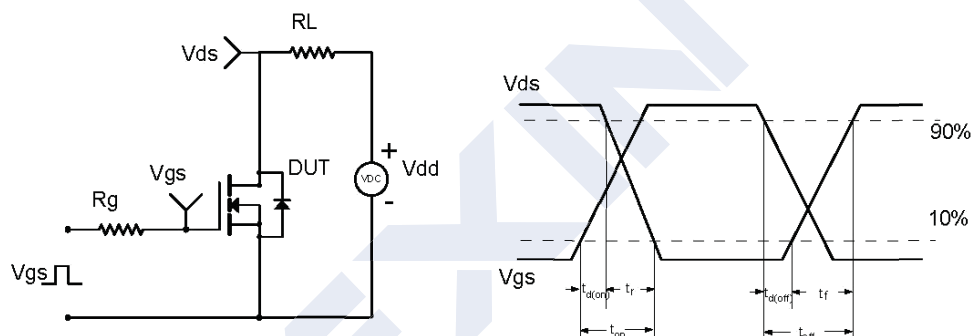


Figure C: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

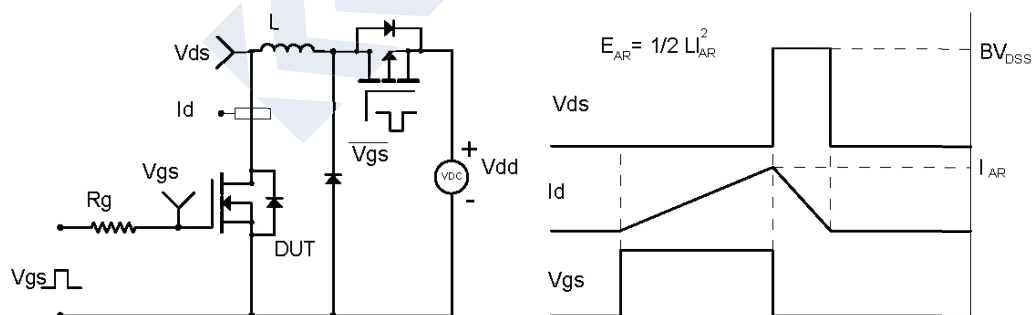
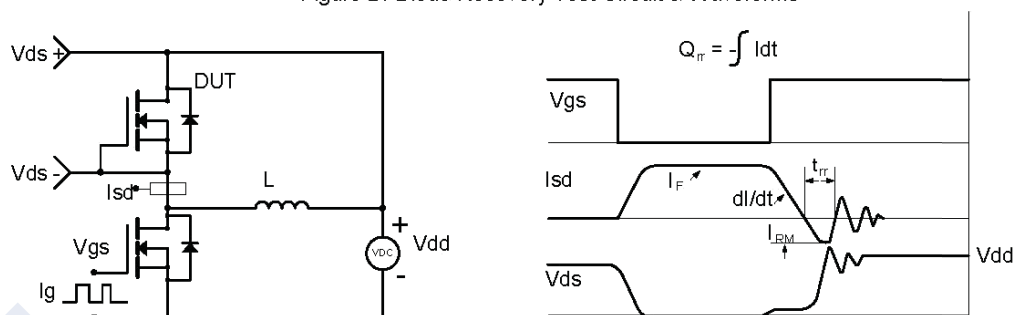
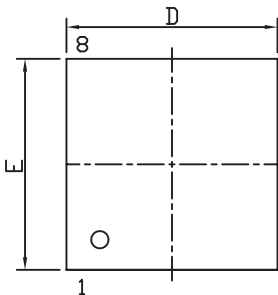


Figure D: Diode Recovery Test Circuit & Waveforms

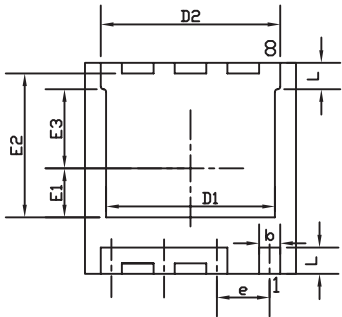


N-Channel MOSFET 2SK3050DFN

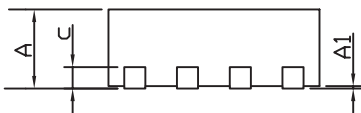
DFN2x2C-8L Package Outline Dimensions



TOP VIEW

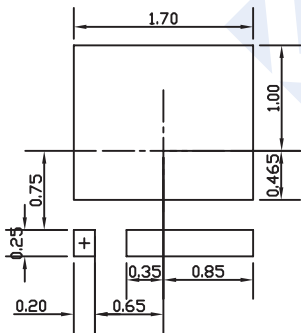


BOTTOM VIEW



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.