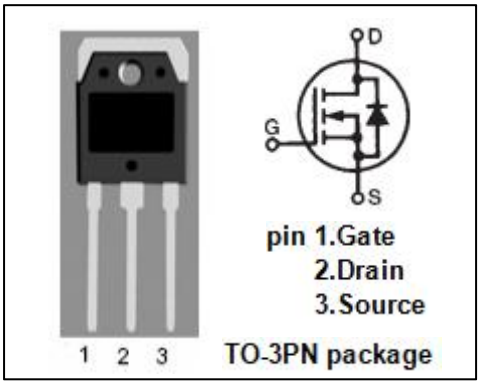
isc N-Channel MOSFET Transistor 2SK2313

DESCRIPTION

- Drain Current I_D = 60A @ T_c=25℃
- Drain Source Voltage V_{DSS} = 60V(Min)
- Fast Switching Speed
- 100% avalanche tested
- Minimum Lot-to-Lot variations for robust device performance and reliable operation



APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- High current switching applications
- DC-DC converter and motor drive applications

ABSOLUTE MAXIMUM RATINGS(T_c=25℃)

SYMBOL	PARAMETER	VALUE	UNIT
V_{DSS}	Drain-Source Voltage (V_{GS}=0)	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current-continuous@ T_C=25℃	60	A
I_{DP}*	Drain Current-Single Pluse	240	A
P_{tot}	Total Dissipation@T_C=25℃	150	W
E_{AS}**	Single pulse avalanche energy	1054	mJ
I_{AS}*	Avalanche Current	72.6	A
T_j	Max. Operating Junction Temperature	150	℃
T_{stg}	Storage Temperature Range	-55~150	℃

THERMAL CHARACTERISTICS

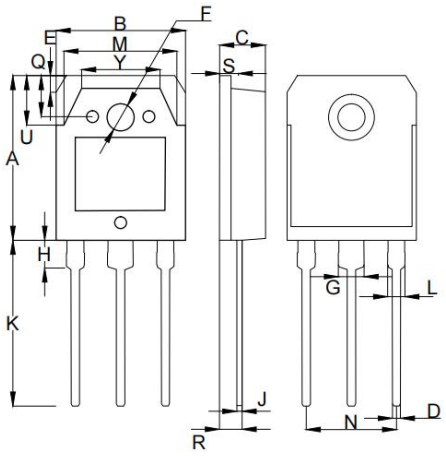
SYMBOL	PARAMETER	MAX	UNIT
$R_{th\ j\text{-}c}$	Thermal Resistance,Junction to Case	0.833	℃/W

Note:

* Repetitive Rating：Pulse width limited by maximum junction temperature

* Pulse Test：Pulse width ≤ 300μs， Duty Cycle ≤ 1%

** V_{DD}=50V，L=0.4mH，R_G=25Ω， I_{AS}=72.6A



DIM	mm		
	MIN	TYP.	MAX
A	19.60	20.00	20.30
B	15.30	15.60	15.90
C	4.70	4.80	4.90
D	0.90	1.00	1.10
E	1.90	2.00	2.10
F	3.40	3.50	3.60
G	2.90	3.00	3.20
H	3.20	3.30	3.40
J	0.595	0.600	0.605
K	19.80	20.20	20.70
L	1.90	2.05	2.20
M	13.30	13.60	13.90
N	10.89	10.90	10.91
Q	4.90	5.00	5.10
R	3.35	3.40	3.45
S	1.995	2.000	2.100
U	5.90	6.00	6.20
Y	9.90	10.00	10.10

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• ELECTRICAL CHARACTERISTICS (T_C=25℃)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}= 0V; I_D= 10mA	60	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = 10V, I_D = 1mA	0.8	-	2.0	V
$R_{DS(ON)}$	Drain-Source On-stage Resistance	V_{GS}= 10V; I_D= 30A	-	-	11	mΩ
I_{GSS}	Gate Source Leakage Current	V_{GS}= ±16V; V_{DS}= 0V	-	-	±10	uA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 60V, V_{GS} = 0V	-	-	100	μA
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz	-	3795	-	pF
C_{oss}	Output Capacitance		-	1456	-	
C_{rss}	Reverse Transfer Capacitance		-	1101	-	
R_G	Gate resistance	f = 1.0MHz open drain	-	0.75	-	Ω
Q_g	Total Gate Charge	V_{DD} = 48V, I_D = 60A, V_{GS} = 10V	-	346	-	nC
Q_{gs}	Gate-Source Charge		-	6	-	
Q_{gd}	Gate-Drain Charge		-	126	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 40V, I_D = 60A, R_G = 25Ω	-	52	-	ns
t_r	Turn-on Rise Time		-	312	-	
$t_{d(off)}$	Turn-off Delay Time		-	905	-	
t_f	Turn-off Fall Time		-	649	-	
Drain - Source Body Diode Characteristics						
I_{SD}	Continuous Source Current	T_c = 25 ℃	-	-	60	A
I_{SM}	Pulsed Source Current		-	-	240	
V_{SD}	Diode Forward Voltage	I_{SD}= 60A; V_{GS}= 0V	-	-	1.7	V
t_{rr}	Reverse Recovery Time	V_{DD} = 40V,I_F = 60A, di_F/dt = 60A /μs	-	300	-	ns
Q_{rr}	Reverse Recovery Charge		-	2.5	-	uC

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Typical Characteristics $T_J = 25^oC$, unless otherwise noted

Figure 1. Output Characteristics (T_J = 25°C)

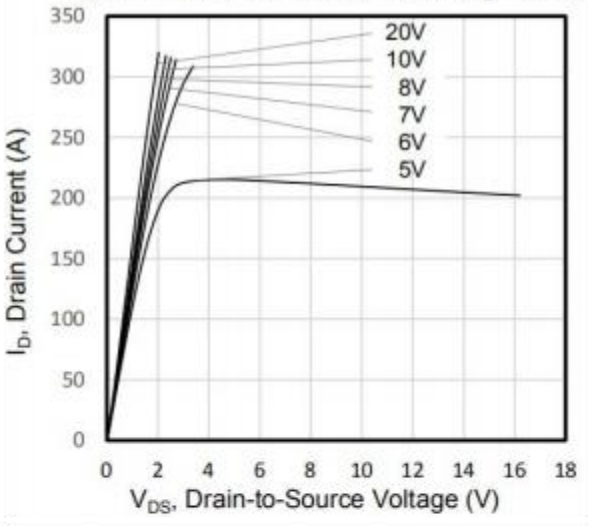

Figure 2. Body Diode Forward Voltage

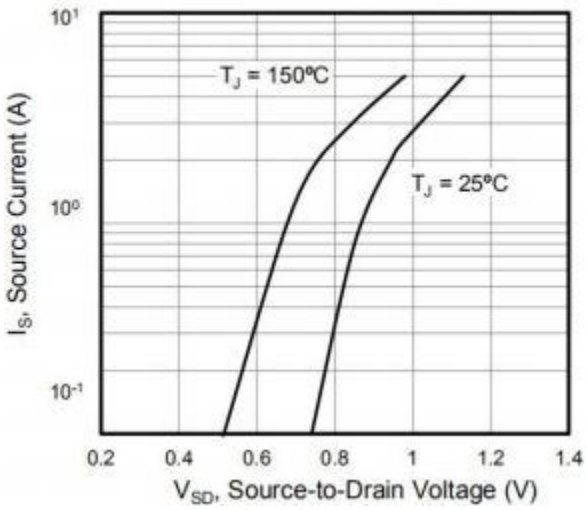

Figure 3. Drain Current vs. Temperature

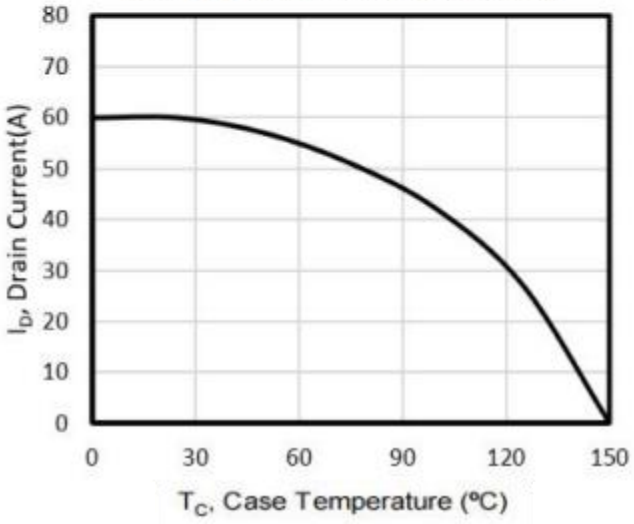

Figure 4. BV_{DSS} Variation vs. Temperature

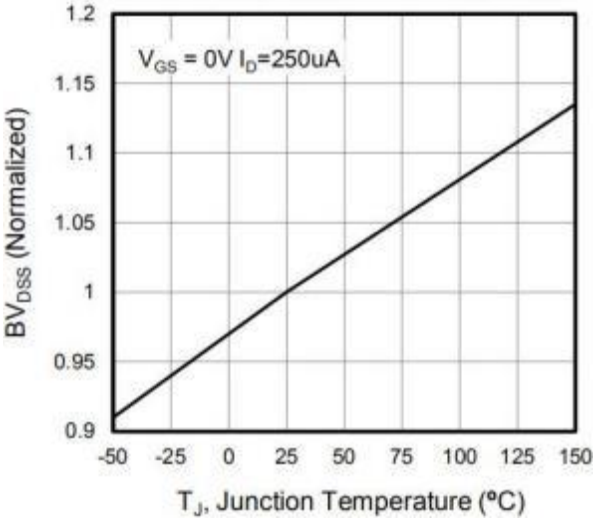

Figure5.Transfercharacteristics

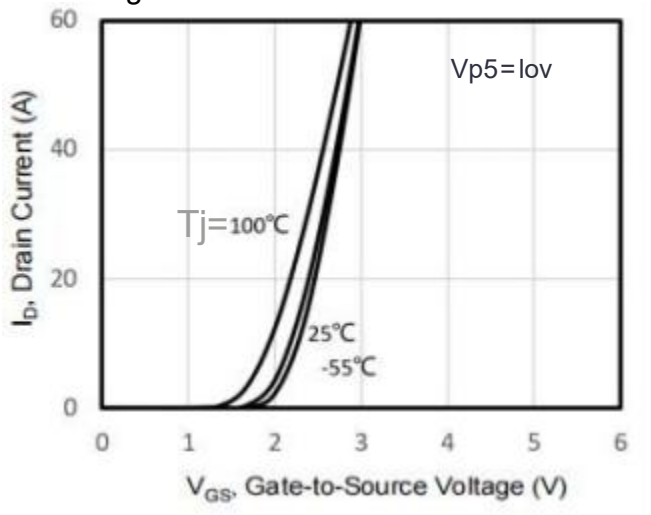

Figure6.on-Resistancevs.Temperature

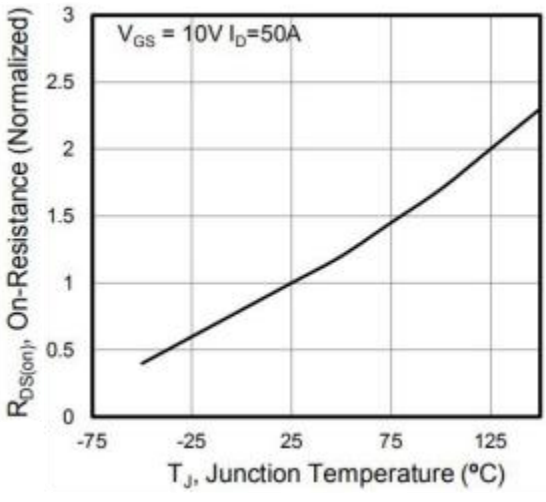

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Figure 7. Capacitance

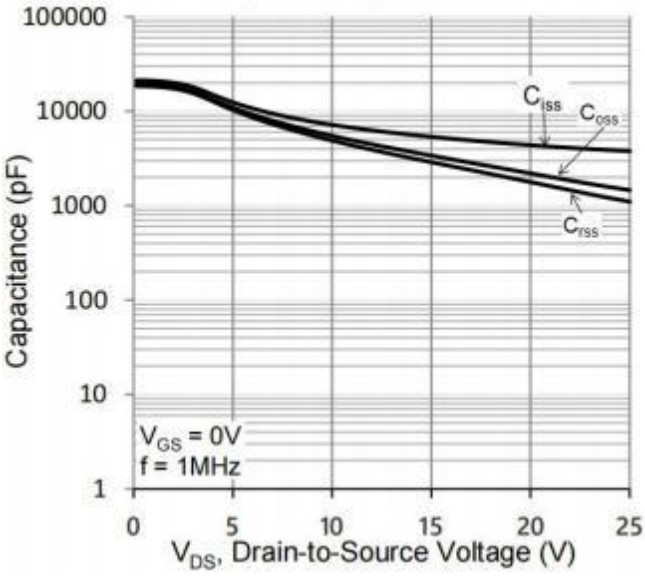


Figure 8. Gate Charge

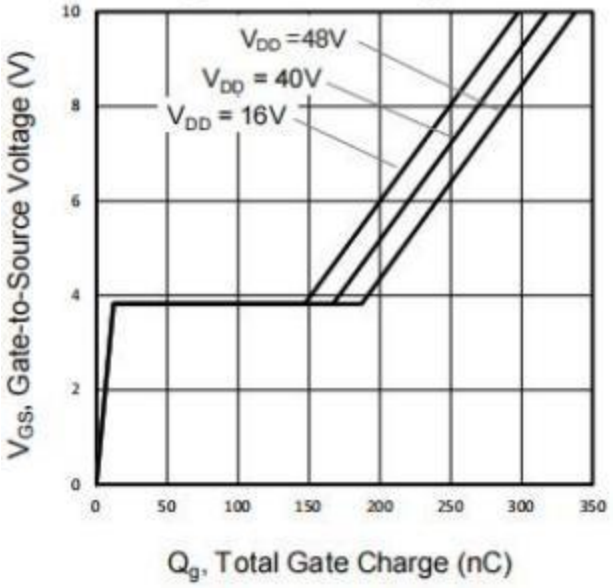


Figure 9. Transient Thermal Impedance

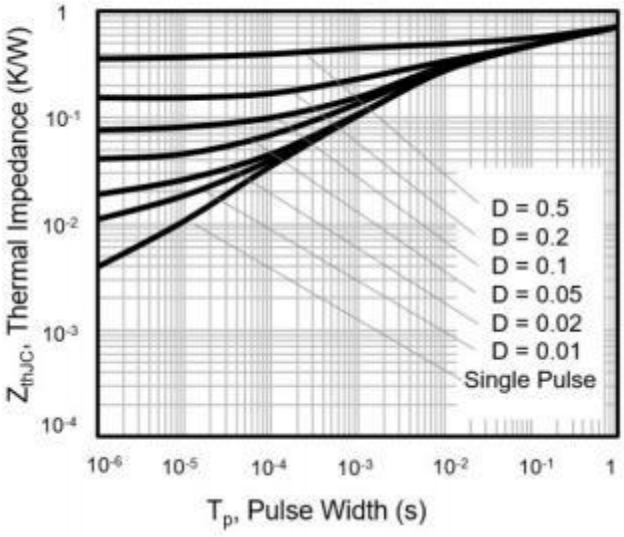


Figure 10. Safe Operating Area

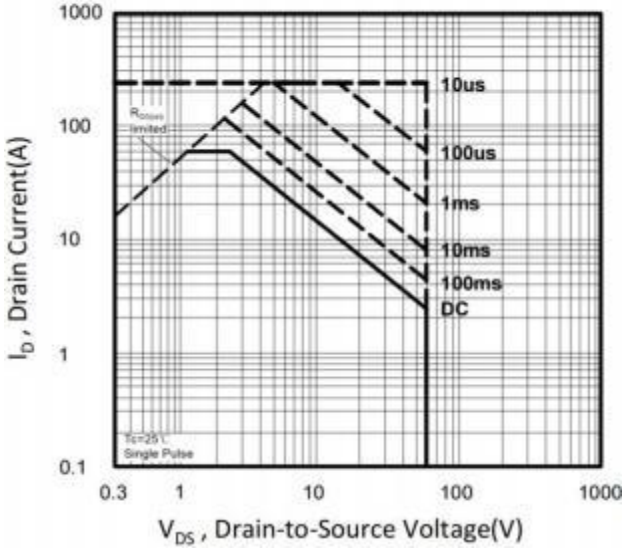


Figure A: Gate Charge Test Circuit and Waveform

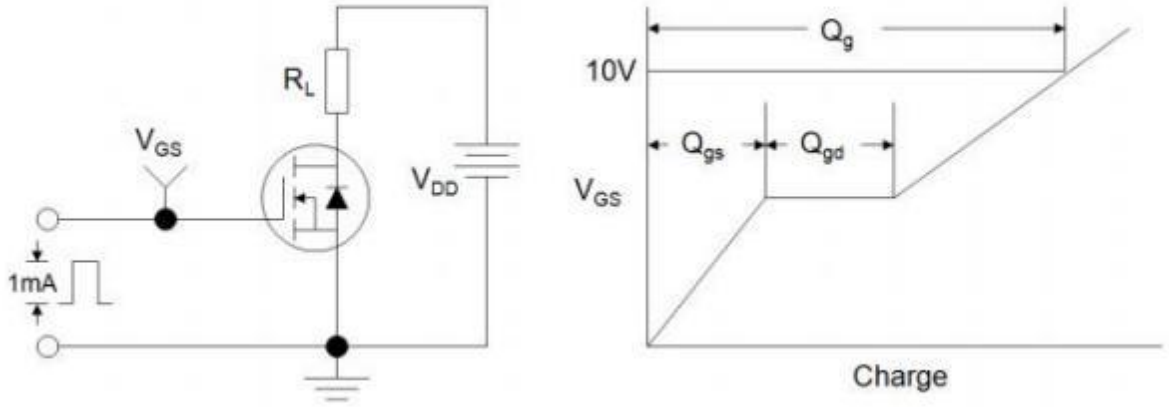


Figure B: Resistive Switching Test Circuit and Waveform

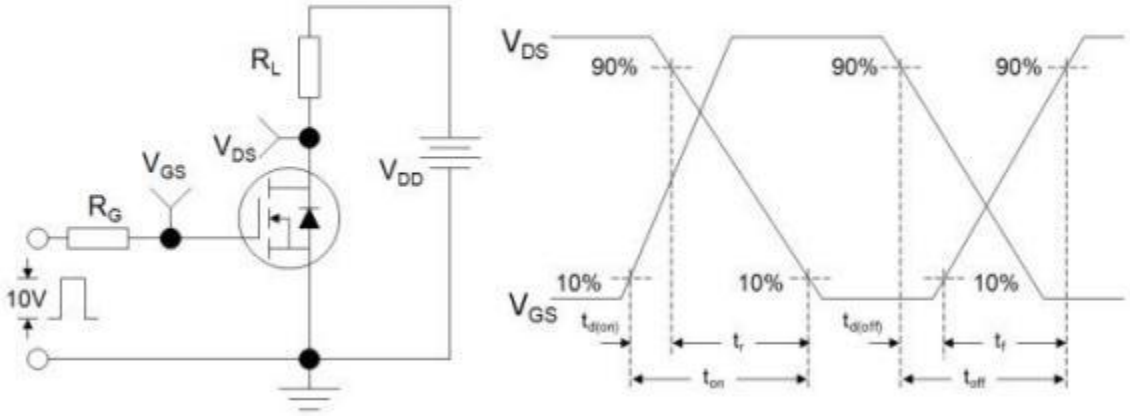
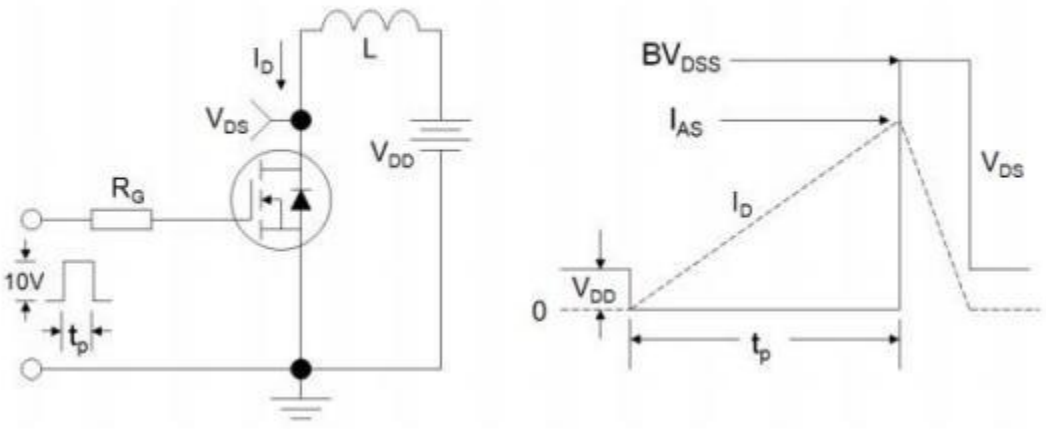


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



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