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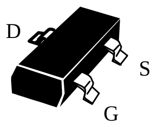
KW2314GD

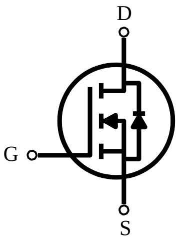
N-Channel High Density Trench MOSFET

FEATURES

- ●Super high dense cell trench design for low $R_{DS(on)}$.
- ●Rugged and reliable.
- ●Surface Mount package.

SOT-23





PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m-ohm) Max
20V	5.4	30 @ V_{GS} = 4.5V
	4.3	46 @ V_{GS} = 2.5V

ABSOLUTE MAXIMUM RATINGS (T_A = 25 ℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous[a] @ T_A = 25 ℃	I_D	5.4	A
-Pulse[b]	I_{DM}	21.5	A
Drain-Source Diode Forward Current[a]	I_S	1.7	A
Maximum Power Dissipation[a] T_A=25 ℃	P_D	1.25	W
T_A=75 ℃		0.75	
Operating Junction and Storage Temperature Range	T_J,T_{STG}	- 55 to 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Ambient[a]	R_{thJA}	100	℃/W

Note
a. Surface Mounted on FR4 Board , t ≤ 10sec .
b. Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS (T_A = 25 ℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V , I_D = 250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V , V_{GS} = 0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS} = 12V , V_{DS} = 0V			100	nA
ON CHARACTERISTICS[b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250uA	0.6	0.83	1.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = 4.5V , I_D = 5.4A		25	30	m-ohm
		V_{GS} = 2.5V , I_D = 4.3A		34	46	
DRAIN-SOURCE DIODE CHARACTERISTICS[b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V , I_S = 1.7A			1.2	V
DYNAMIC CHARACTERISTICS[c]						
Input Capacitance	C_{ISS}	V_{DS} = 8V , V_{GS} = 0V f = 1.0MHz		512		pF
Output Capacitance	C_{OSS}			130		pF
Reverse Transfer Capacitance	C_{RSS}			105		pF
SWITCHING CHARACTERISTICS[c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = 10V , I_D = 3A V_{GEN} = 4.5V R_L = 3.3 ohm R_{GEN} = 6 ohm		9.8		ns
Rise Time	t_r			3.8		ns
Turn-Off Delay Time	$t_{D(OFF)}$			21		ns
Fall Time	t_f			5.2		ns
Total Gate Charge	Q_g	V_{DS} = 10V , I_D = 3A V_{GS} = 4.5V		5.7		nC
Gate-Source Charge	Q_{gs}			1.6		nC
Gate-Drain Charge	Q_{gd}			1.3		nC

Note
b. Pulse Test Pulse width ≤ 300us , Duty Cycle ≤ 2% .
c. Guaranteed by design , not subject to production testing .

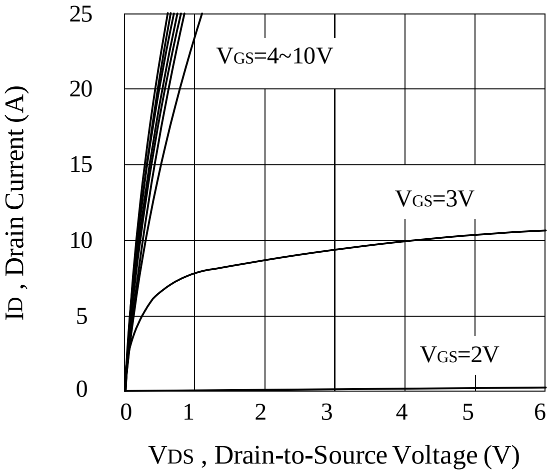


Figure 1. Output Characteristics

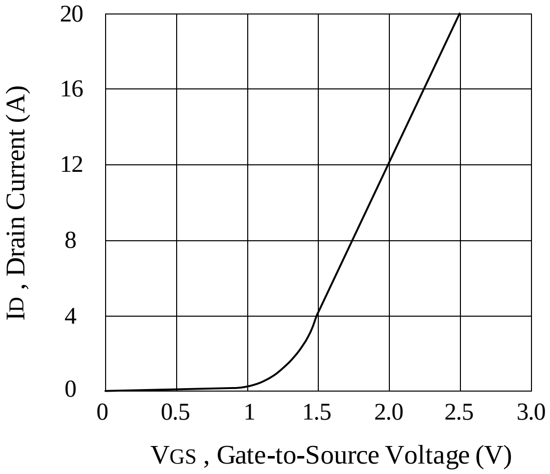


Figure 2. Transfer Characteristics

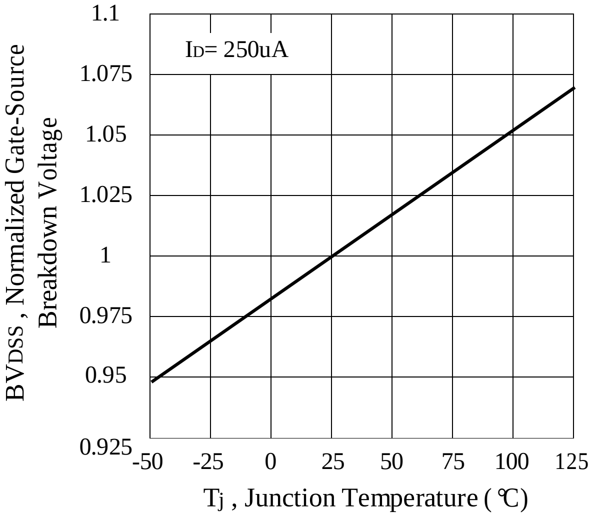


Figure 3. Breakdown Voltage Variation with Temperature

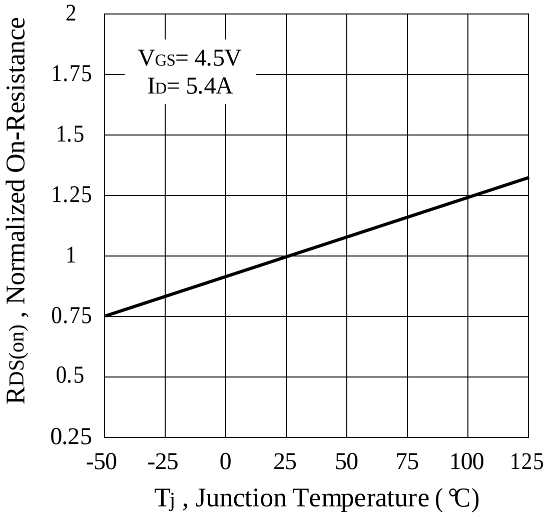


Figure 4. On-Resistance Variation with Temperature

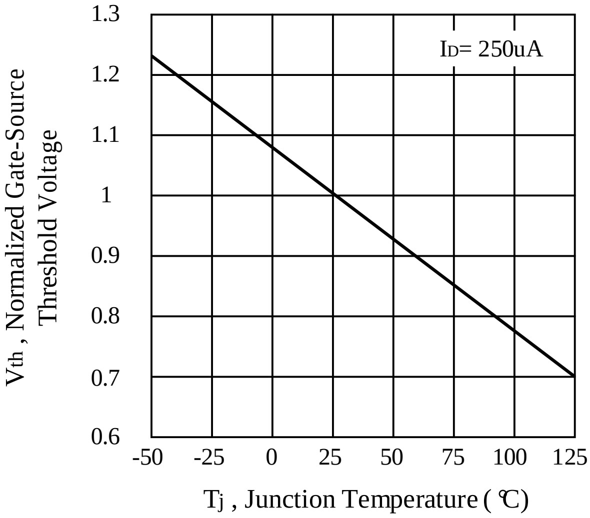


Figure 5. Gate Threshold Variation with Temperature

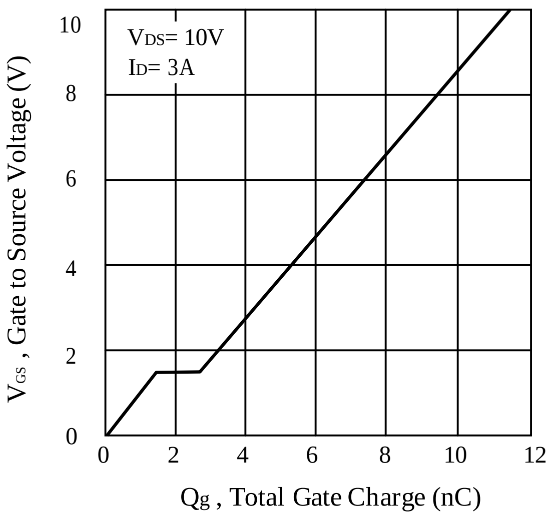


Figure 6. Gate Charge

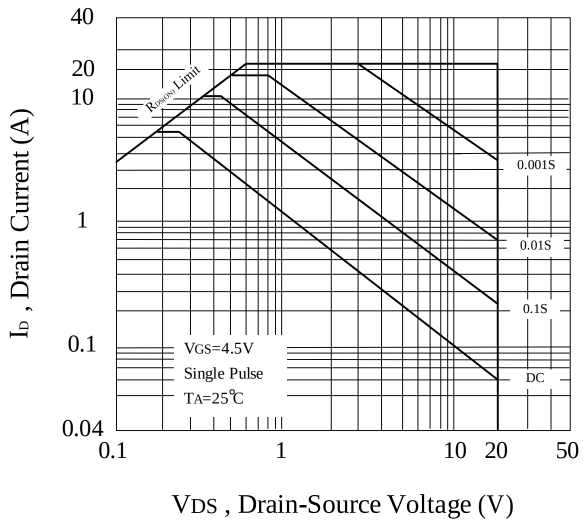


Figure 7. Maximum Safe Operating Area

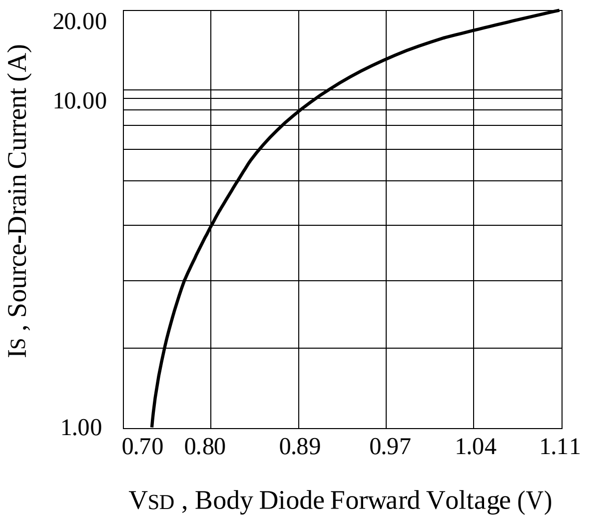


Figure 8. Body Diode Forward Voltage Variation with Source Current

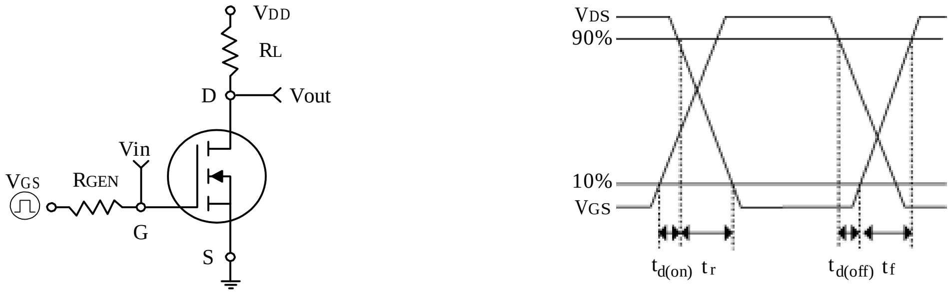


Figure 9. Switching Test Circuit and Switching Waveforms

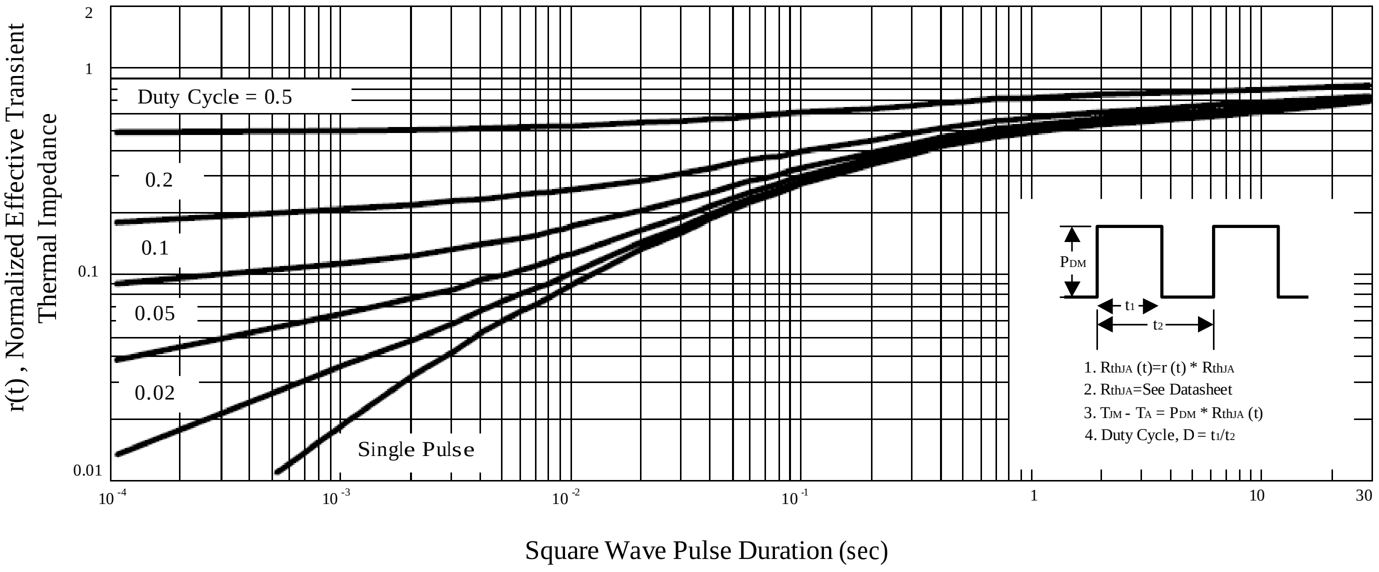


Figure 10. Normalized Thermal Transient Impedance Curve