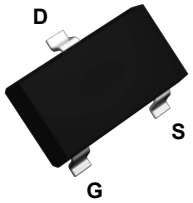
GOOD-ARK SEMICONDUCTOR

GSFKW0202

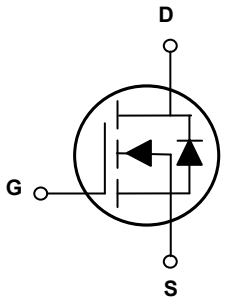
20V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	20V
$R_{DS(ON)}$	70mΩ (Max.)
I_D	2.5A



SOT-323



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switch mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The GSFKW0202 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current, @ Steady-State (T_A=25°C)[1]	I_D	2.5	A
Continuous Drain Current, @ Steady-State (T_A=70°C)[1]		2	A
Pulsed Drain Current[2]	I_{DM}	14	A
Power Dissipation (T_A=25°C)	P_D	0.7	W
Derating Factor (T_A=25°C)		5.6	W/°C
Thermal Resistance, Junction-to-Ambient @ Steady-State[3]	$R_{\theta JA}$	178	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	20	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	50	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=10V	-	-	100	nA
		V_{GS}=-10V	-	-	-100	
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=2.5A	-	57	70	mΩ
		V_{GS}=2.5V, I_D=2.0A	-	72	98	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	0.55	0.78	1.1	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V, F=1.0MHz	-	280	-	pF
Output Capacitance	C_{oss}		-	46	-	
Reverse Transfer Capacitance	C_{rss}		-	29	-	
Total Gate Charge	Q_g	V_{DS}=10V, I_D=2.5A, V_{GS}=10V	-	2.9	-	nC
Gate-Source Charge	Q_{gs}		-	0.4	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	0.6	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=10V, I_D=6.6A, R_L=1.5Ω, V_{GS}=4.5V, R_{GEN}=3Ω	-	13	-	nS
Rise Time	t_r		-	54	-	
Turn-Off Delay Time	$t_{d(off)}$		-	18	-	
Fall Time	t_f		-	11	-	
Drain-Source Ratings and Characteristics						
Continuous Source Current (Body Diode)[2]	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	2.5	A
Pulsed Source-Drain Current (Body Diode)	I_{SM}		-	-	14	A
Diode Forward Voltage	V_{SD}	I_S=2.5A, V_{GS}=0V	-	0.86	1.2	V

Notes
1. Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.
2. Repetitive rating: Pulse width limited by maximum junction temperature.
3. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch, t ≤ 10 sec.

Typical Electrical and Thermal Characteristic Curves

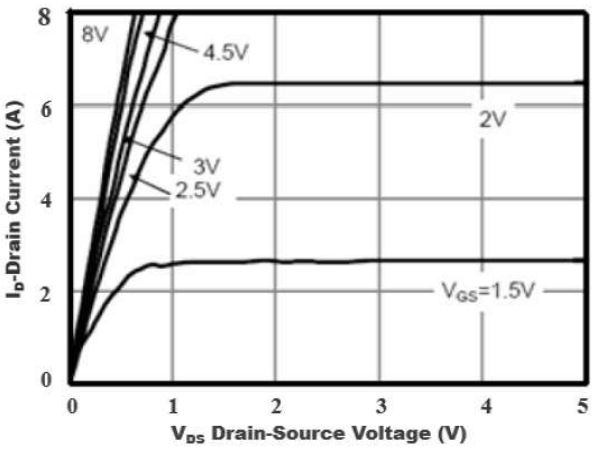


Figure 1. Typical Output Characteristics

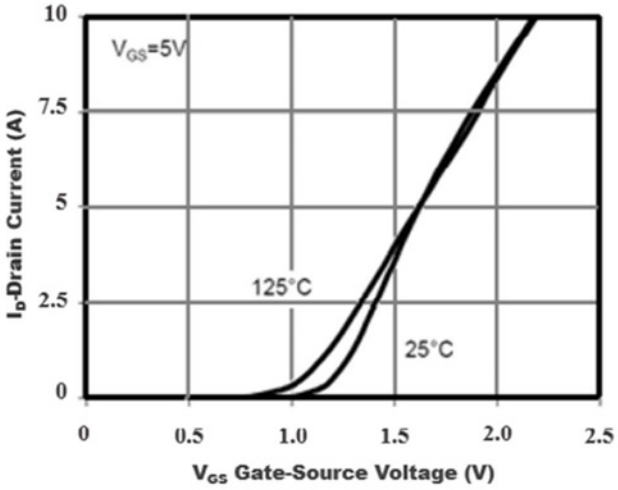


Figure 2. Transfer Characteristics

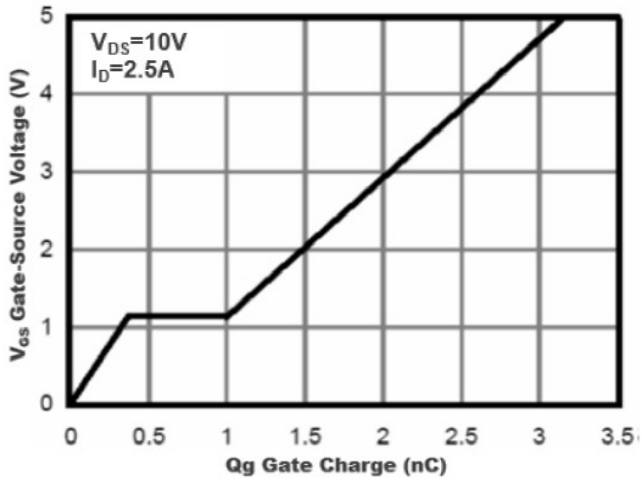


Figure 3. Gate Charge

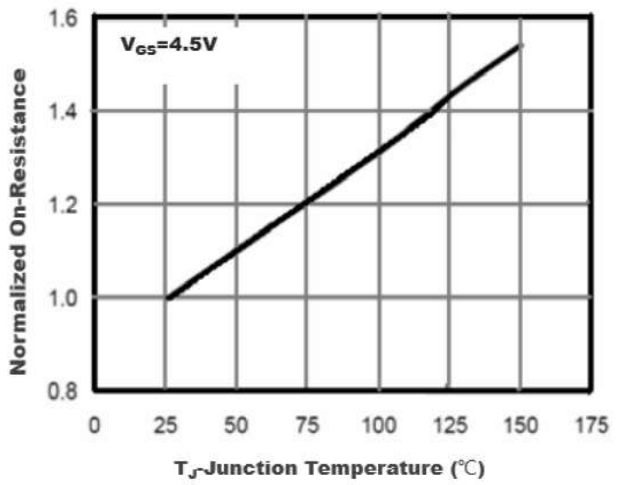


Figure 4. Normalized On-Resistance vs. Junction Temperature

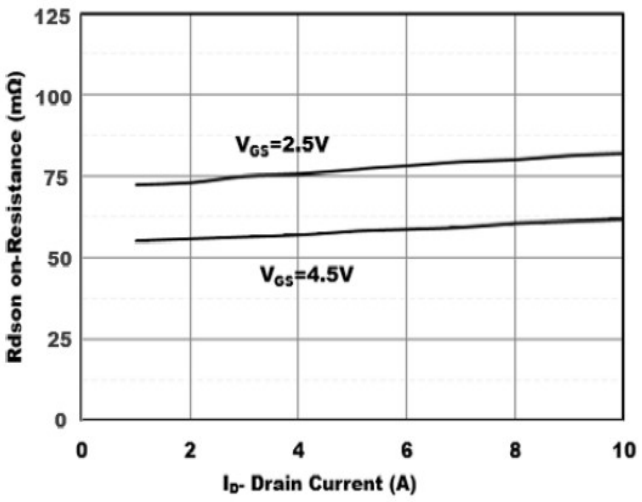


Figure 5. Drain-Source On-Resistance

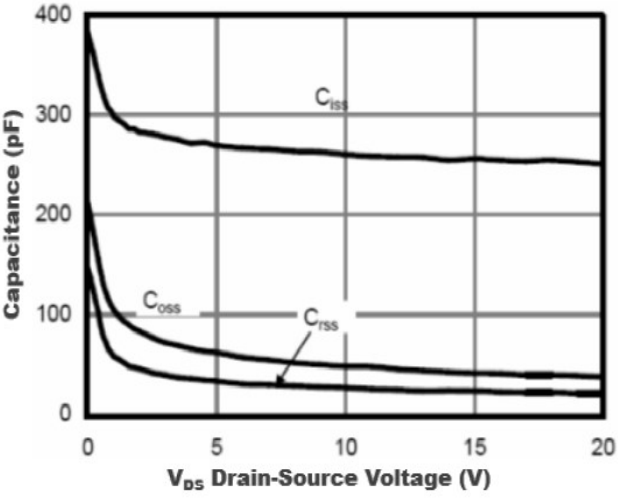


Figure 6. Typical Capacitance vs. Drain-to-Source Voltage

Typical Electrical and Thermal Characteristic Curves

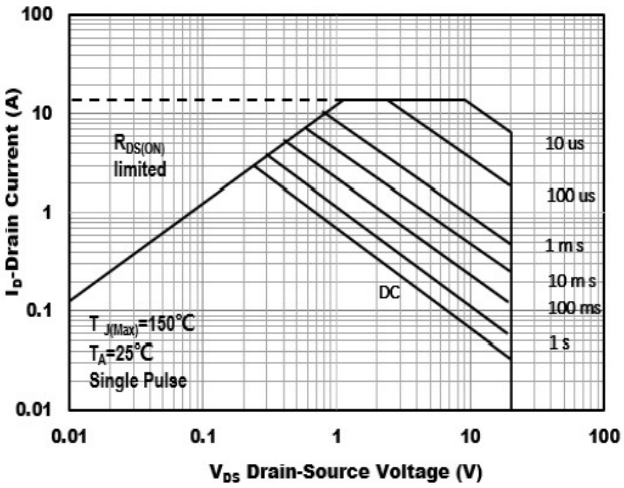
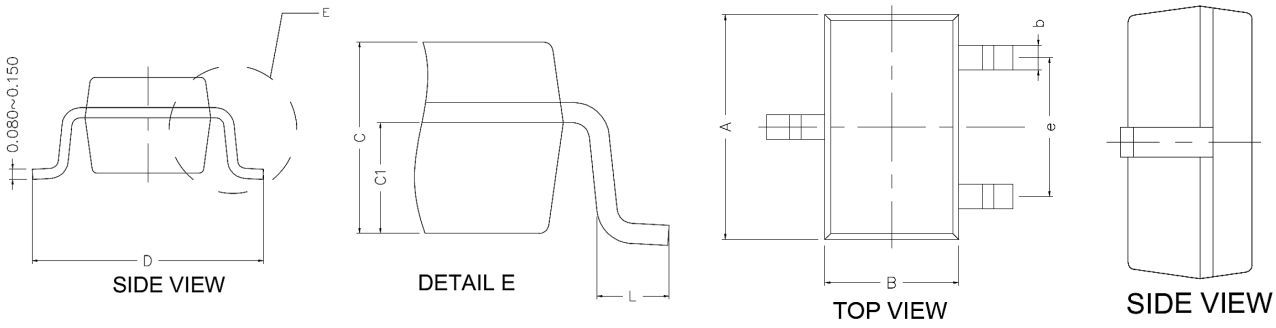


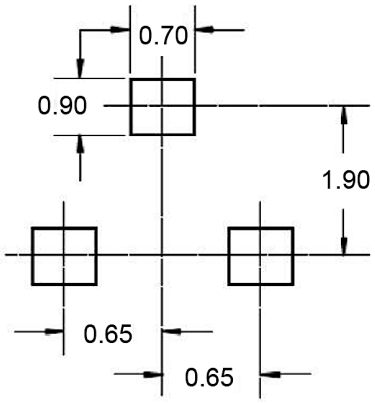
Figure 7. Safe Operation Area

Package Outline Dimensions (SOT-323)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.00	2.20	0.079	0.087
B	1.15	1.35	0.045	0.053
C	0.90	1.00	0.035	0.039
C1	0.50	0.60	0.020	0.024
D	2.10	2.50	0.083	0.098
L	0.22	0.50	0.009	0.020
b	0.20	0.40	0.008	0.016
e	1.30 Typ		0.051 Typ	

Recommended Pad Layout



Unit: mm

Order Information

Device	Package	Marking	Carrier	Quantity
GSFKW0202	SOT-323	TS2	Tape & Reel	3,000 Pcs / Reel