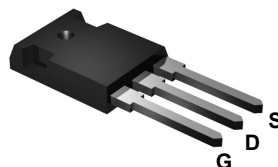
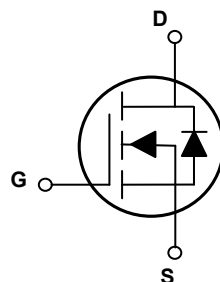


Main Product Characteristics

$V_{(BR)DSS}$	650V
$R_{DS(ON)}$	50mΩ (max.)
I_D	60A



TO-247



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery
- AEC-Q101 qualified



Description

The GSGA65RF050AU 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 supplies and a wide variety of other applications.

Absolute Maximum Ratings ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^{\circ}\text{C}$)	I_D	60	A
Continuous Drain Current, @ Steady-State ($T_C=100^{\circ}\text{C}$)		39	A
Pulsed Drain Current	I_{DM}	240	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	446	W
		3.57	W/ $^{\circ}\text{C}$
Single Pulse Avalanche Energy ¹	E_{AS}	2646	mJ
Body Diode Reverse Voltage Slope ²	dv/dt	50	V/ns
MOS dv/dt Ruggedness ³	dv/dt	100	V/ns
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	50	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.28	$^{\circ}\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	$^{\circ}\text{C}$
Soldering Temperature	T_{sold}	260	$^{\circ}\text{C}$

Electrical Characteristics (T_J=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	650	-	-	V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V, T _J =25°C	-	-	1.0	μA
		V _{DS} =650V, V _{GS} =0V, T _J =125°C	-	-	15	μA
Gate-to-Source Forward Leakage	I _{GSS}	V _{DS} =0V, V _{GS} =20V	-	-	100	nA
		V _{DS} =0V, V _{GS} =-20V	-	-	-100	
Static Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =30A	-	43	50	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	3.1	-	4.9	V
Dynamic and Switching Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =200V, f=1MHz	-	6285	-	pF
Output Capacitance	C _{oss}		-	166	-	
Reverse Transfer Capacitance	C _{rss}		-	7.3	-	
Total Gate Charge ^{4,5}	Q _g	I _D =44A, V _{DD} =480V, V _{GS} =10V	-	138	-	nC
Gate-to-Source Charge ^{4,5}	Q _{gs}		-	52	-	
Gate-to-Drain ("Miller") Charge ^{4,5}	Q _{gd}		-	56	-	
Gate Plateau ^{4,5}	V _{plateau}		-	7.5	-	V
Turn-On Delay Time ^{4,5}	t _{d(on)}	V _{DD} =400V, V _{GS} =13V, R _G =1.8Ω, I _D =44A	-	36	-	nS
Rise Time ^{4,5}	t _r		-	37	-	
Turn-Off Delay Time ^{4,5}	t _{d(off)}		-	98	-	
Fall Time ^{4,5}	t _f		-	24	-	
Gate Resistance	R _g	f=1MHz	-	2.1	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I _S	T _C =25°C, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	60	A
Source Pulse Current	I _{SM}		-	-	240	A
Diode Forward Voltage	V _{SD}	I _S =30A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time ⁴	T _{rr}	I _S =44A, V _{GS} =0V, dI _F /dt=100A/us	-	154	-	nS
Reverse Recovery Charge ⁴	Q _{rr}		-	1.2	-	μC
Reverse Recovery Peak Current ⁴	I _{rrm}		-	13	-	A

Notes:

1. L=79mH, I_{AS}=7.6A, V_{DD}=100V, R_G=25Ω, starting temperature T_J=25°C
2. V_{DS}=0-400V, I_{SD}≤I_S, T_J=25°C.
3. V_{DS}=0-400V.
4. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

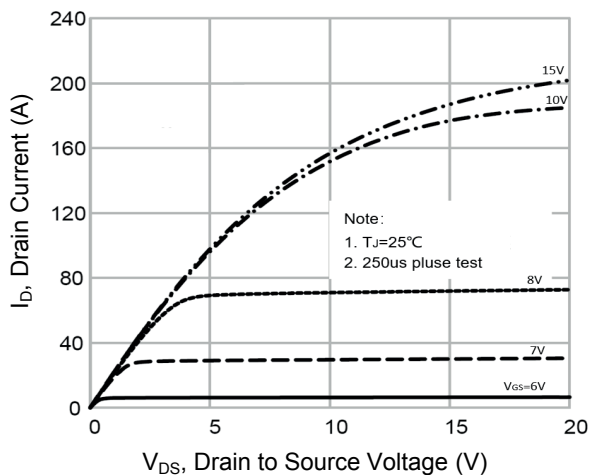


Figure 1. Typical Output Characteristics

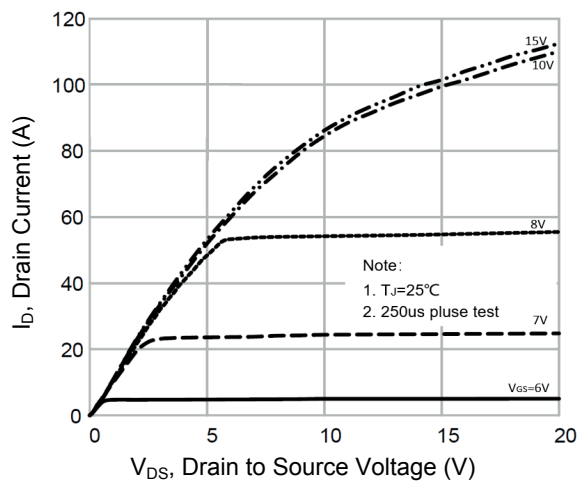


Figure 2. Typical Output Characteristics

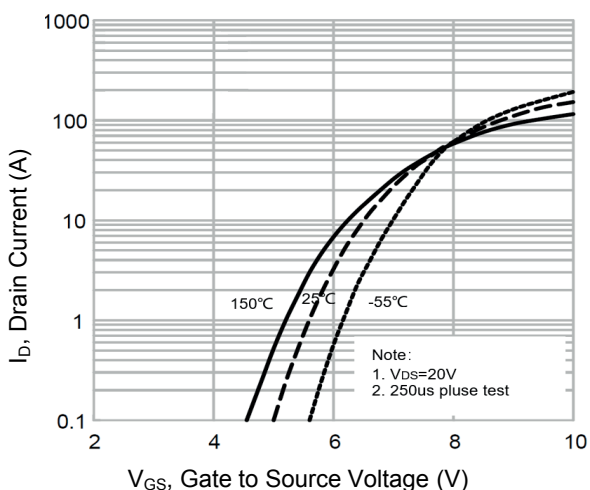


Figure 3. Transfer Characteristics

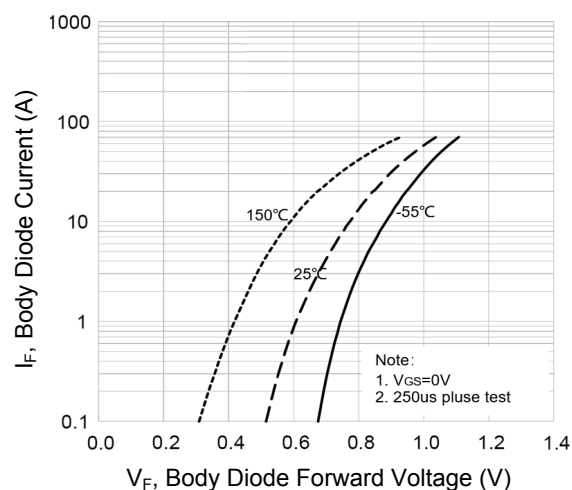


Figure 4. Body Diode Characteristics

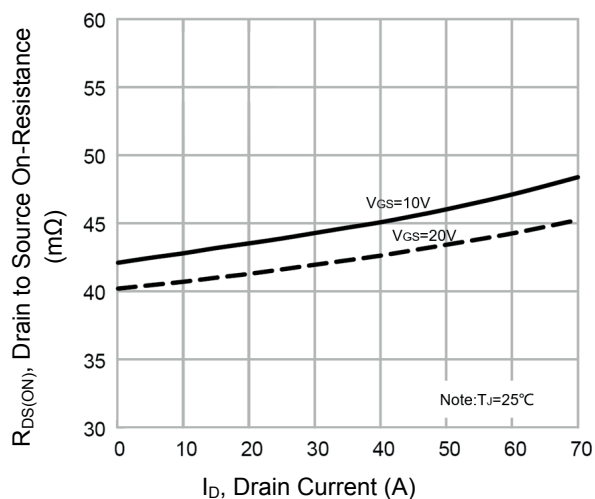


Figure 5. $R_{DS(ON)}$ vs. Drain Current

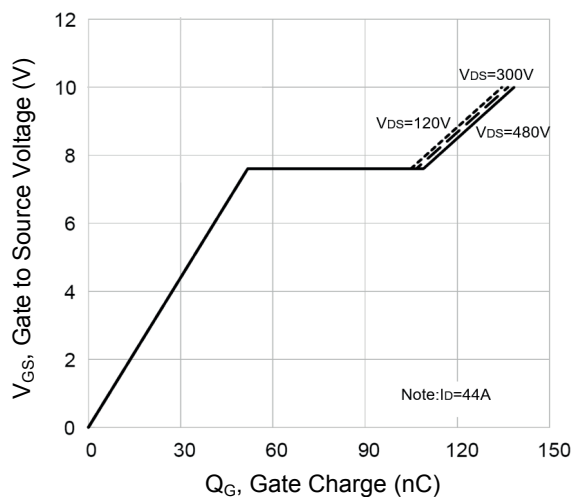


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

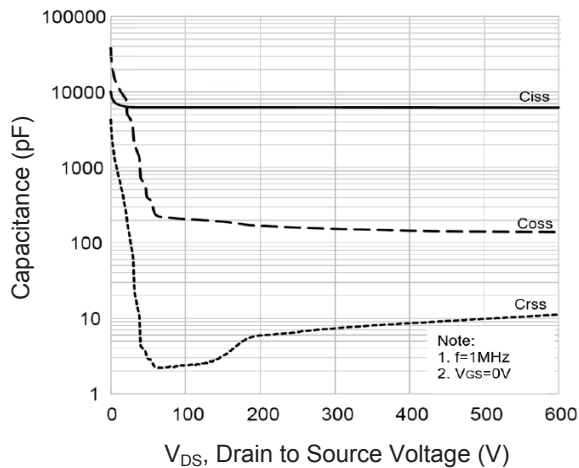


Figure 7. Capacitance Characteristics

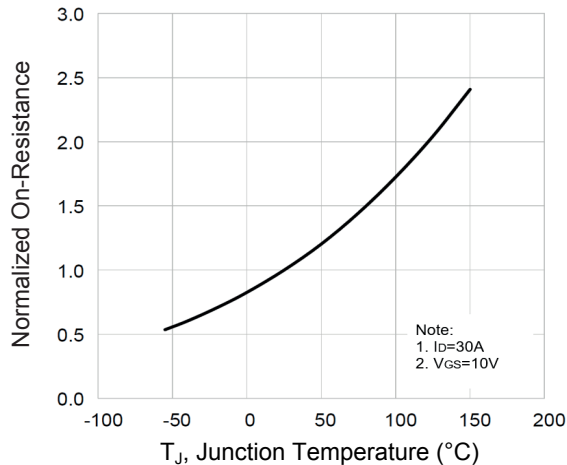


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

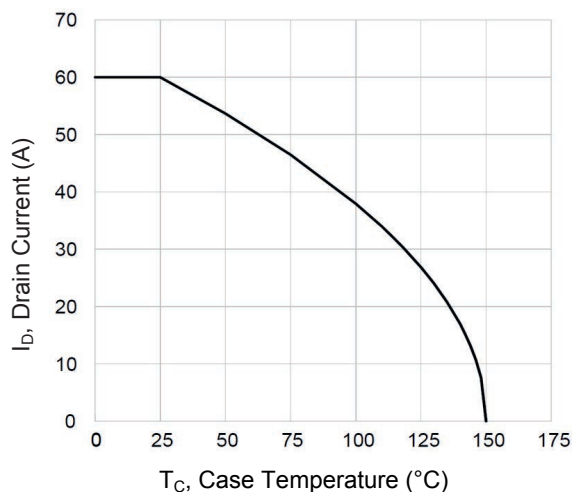


Figure 9. Drain Current vs. T_C

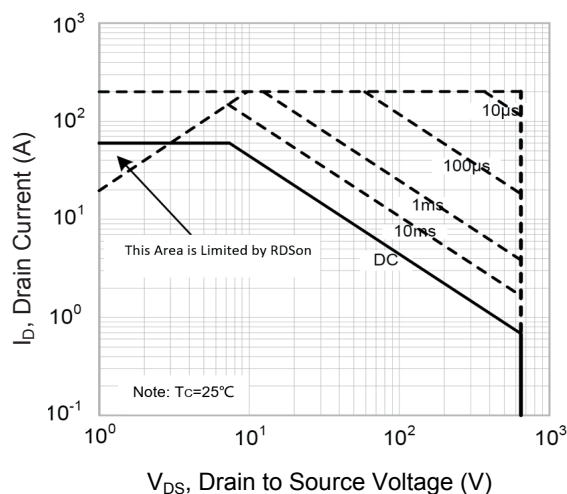


Figure 10. Safe Operation Area

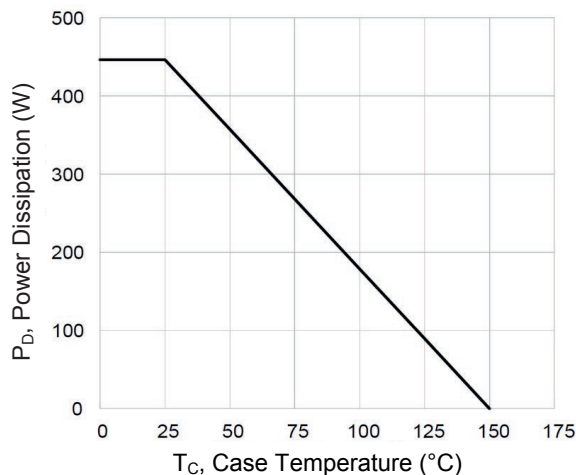


Figure 11. Power Dissipation vs. T_C

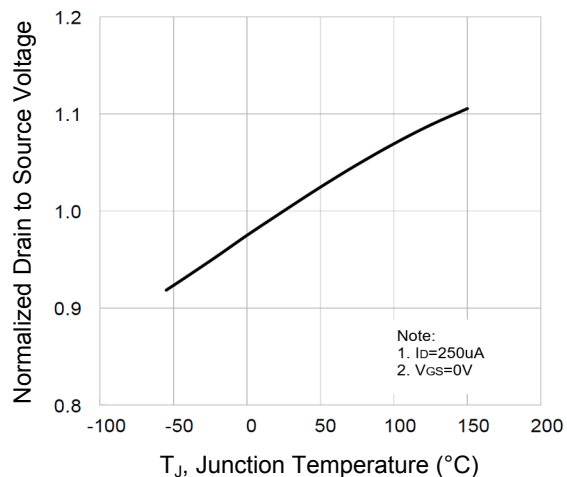
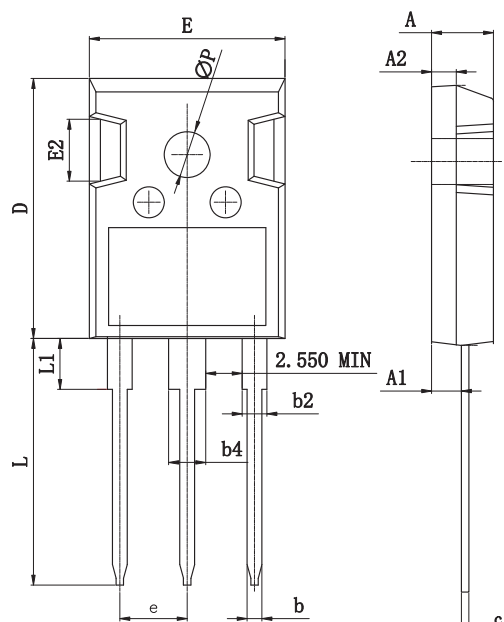


Figure 12. Normalized BV_{DS} vs. T_J

Package Outline Dimensions (TO-247)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.75	5.20	0.187	0.205
A1	2.21	2.65	0.087	0.104
A2	1.85	2.15	0.073	0.085
b	1.00	1.36	0.039	0.054
b2	1.80	2.25	0.071	0.089
b4	2.91	3.25	0.115	0.128
c	0.51	0.75	0.020	0.030
D	20.80	21.30	0.819	0.839
E	15.50	16.10	0.610	0.634
E2	4.40	5.20	0.173	0.205
e	5.44 BSC		0.214 BSC	
L	19.72	20.22	0.776	0.796
L1	-	4.30	-	0.169
P	3.40	3.80	0.134	0.150

Order Information

Device	Package	Marking	Carrier	Quantity
GSGA65RF050AU	TO-247	A65RF050	Tube	30 Pcs / Tube

For more information, please contact us at: inquiry@goodarksemi.com