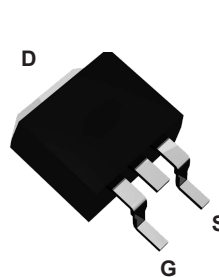
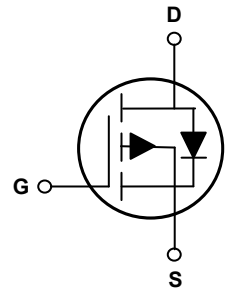


Main Product Characteristics

$V_{(BR)DSS}$	-40V
$R_{DS(ON)}$	5m Ω (Max)
I_D	-88A



TO-263 (D²PAK)



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Low on-resistance and low gate charge
- Featuring low switching and drive losses
- Fast switching and reverse body recovery
- High ruggedness and robustness
- AEC-Q101 qualified



Description

The GSFT4005AU 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 ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$), $V_{GS}=10\text{V}^1$	I_D	-88	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$), $V_{GS}=10\text{V}^1$		-70	A
Drain Current-Pulsed ²	I_{DM}	-352	A
Pulsed Source Current (Body Diode) ²	I_{SM}	-352	A
Maximum Power Dissipation ($T_C=25^\circ\text{C}$) ³	P_D	124	W
Single Pulse Avalanche Energy ($L=0.3\text{mH}$)	E_{AS}	576	mJ
Single Pulse Avalanche Current ($L=0.3\text{mH}$)	I_{AS}	48	A
Thermal Resistance Junction-to-Ambient ($t \leq 10\text{s}$) ⁴	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Maximum Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.21	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 To +175	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 To +175	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =-250uA	-40	-	-	V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =-40V, V _{GS} =0V	-	-	-1	μA
Drain-to-Source Leakage Current		V _{DS} =-40V, V _{GS} =0V, T _J =125°C	-	-	-50	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-1.1	-1.7	-2.8	V
Drain Static-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-20A	-	3.4	5	mΩ
		V _{GS} =-4.5V, I _D =-20A	-	4.5	6	mΩ
Dynamic and Switching Characteristics						
Total Gate Charge	Q _g	V _{DD} =-20V, I _D =-20A, V _{GS} =-10V	-	119	-	nC
Gate-Source Charge	Q _{gs}		-	15	-	
Gate-Drain Charge	Q _{gd}		-	23	-	
Turn-On Delay Time	t _{d(on)}	V _{DD} =-20V, R _G =3Ω, R _L =1.0Ω, V _{GS} =-10V, I _D =-20A	-	17	-	nS
Rise Time	t _r		-	18	-	
Turn-Off Delay Time	t _{d(off)}		-	69	-	
Fall Time	t _f		-	33	-	
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, F=1MHz	-	6800	-	pF
Output Capacitance	C _{oss}		-	546	-	
Reverse Transfer Capacitance	C _{rss}		-	345	-	
Gate Resitance	R _g	F=1MHz	-	2.1	-	Ω
Source-Drain Ratings and Characteristics						
Maximum Body-Diode Continuous Current	I _S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	-88	A
Maximum Body-Diode Pulse Current	I _{SM}		-	-	-352	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-20A, T _J =25°C	-	-0.8	-1.2	V
Reverse Recovery Time	T _{rr}	I _F =-20A di/dt=100A/μs, T _J =25°C	-	27	-	nS
Reverse Recovery Charge	Q _{rr}		-	146	-	nC

Notes:

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. The power dissipation P_D is based on max. junction temperature, using junction-to-case thermal resistance.
4. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$.

Typical Electrical and Thermal Characteristic Curves

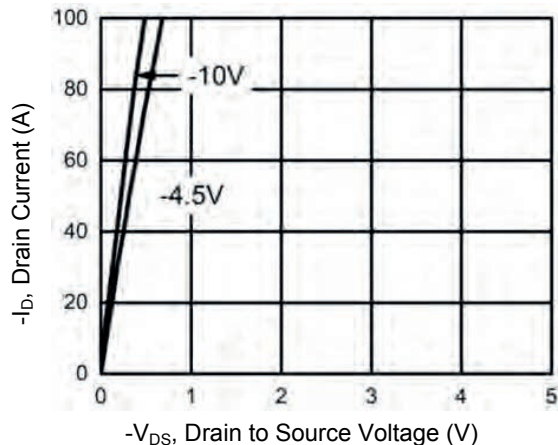


Figure 1. Output Characteristics

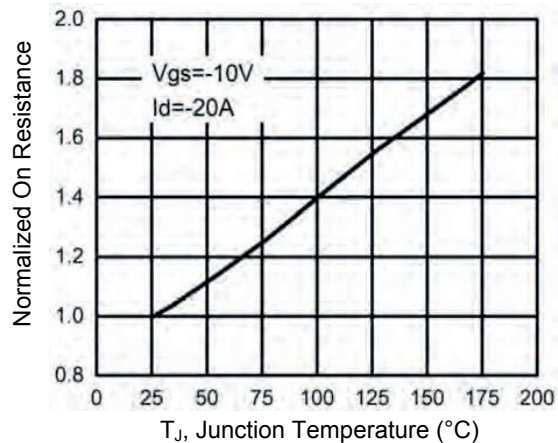


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

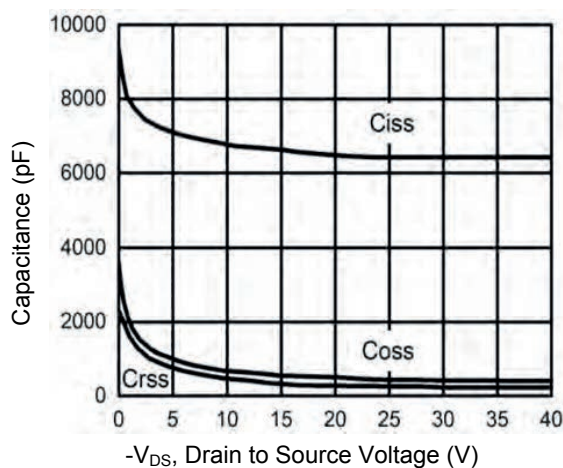


Figure 3. Capacitance Characteristics

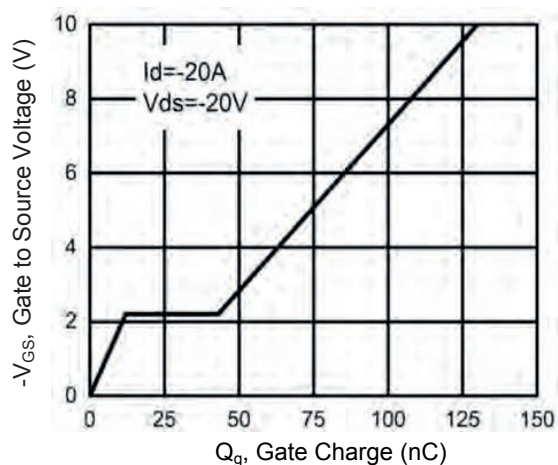


Figure 4. Gate Charge Waveform

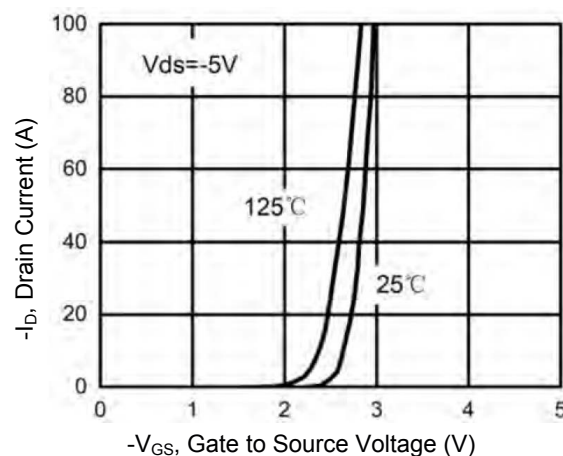


Figure 5. Transfer Characteristics

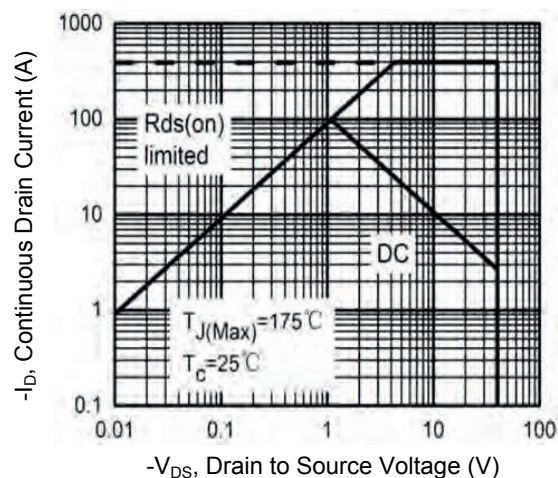
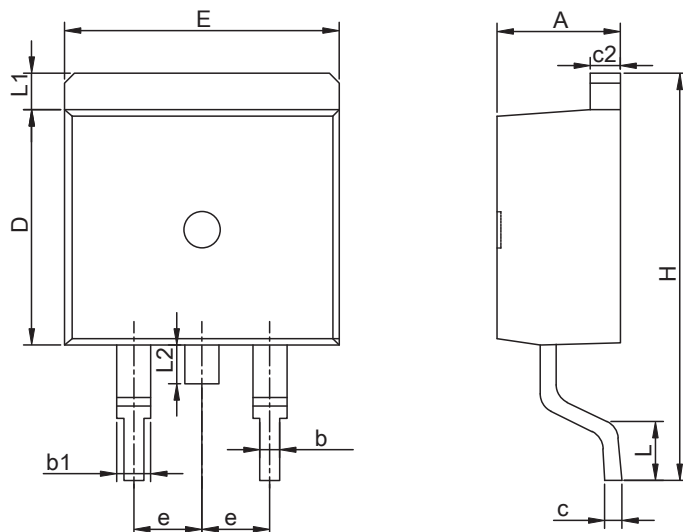


Figure 6. Maximum Safe Operation Area

Package Outline Dimensions TO-263 (D²PAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.90	0.169	0.193
b	0.70	0.95	0.028	0.037
b1	1.07	1.50	0.042	0.059
c	0.28	0.60	0.011	0.024
c2	1.17	1.37	0.046	0.054
D	8.40	9.35	0.331	0.368
E	9.80	10.45	0.386	0.411
e	2.54 BSC		0.100 BSC	
H	14.70	16.30	0.579	0.642
L	2.00	3.80	0.079	0.150
L1	0.97	1.42	0.038	0.056
L2	-	1.75	-	0.069

Order Information

Device	Package	Marking	Packaging	SPQ
GSFT4005AU	TO-263 (D ² PAK)	T4005AU	Tape & Reel	800 Pcs / Reel