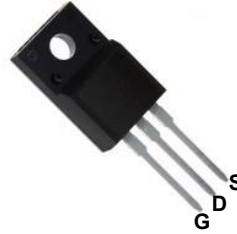
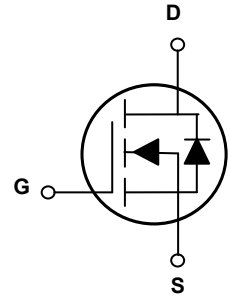


Main Product Characteristics

BV_{DSS}	650V
$R_{DS(ON)}$	190m Ω
I_D	20A



TO-220F



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

Description

The GSFU6522 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$)	I_D	20	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		12.5	
Drain Current-Pulsed ¹	I_{DM}	80	A
Single Pulse Avalanche Energy	E_{AS}	420	mJ
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	45	W
Power Dissipation-Derate above 25°C		0.36	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.75	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=1mA$	650	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1	μA
		$V_{DS}=520V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	-	160	190	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	2	3	4	V
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{DS}=480V, I_D=10A, V_{GS}=10V$	-	47	70	nC
Gate-Source Charge ^{2,3}	Q_{gs}		-	5	8	
Gate-Drain Charge ^{2,3}	Q_{gd}		-	14	21	
Turn-On Delay Time ^{2,3}	$t_{d(on)}$	$V_{DD}=480V, R_G=25\Omega, V_{GS}=10V, I_D=10A$	-	32	48	nS
Rise Time ^{2,3}	t_r		-	73	110	
Turn-Off Delay Time ^{2,3}	$t_{d(off)}$		-	146	220	
Fall Time ^{2,3}	t_f		-	47	70	
Input Capacitance	C_{iss}	$V_{DS}=100V, V_{GS}=0V, F=1\text{MHz}$	-	1400	2100	pF
Output Capacitance	C_{oss}		-	55	85	
Reverse Transfer Capacitance	C_{rss}		-	1.3	4.6	
Gate Resistance ^{2,3}	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	8	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	20	A
Pulsed Source Current	I_{SM}		-	-	40	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=10A, T_J=25^{\circ}\text{C}$	-	-	1.4	V
Reverse Recovery Time	t_{rr}	$V_R=400V, I_S=10A, di/dt=100A/\mu\text{s}, T_J=25^{\circ}\text{C}$	-	310	-	nS
Reverse Recovery Charge	Q_{rr}		-	4.4	-	μC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

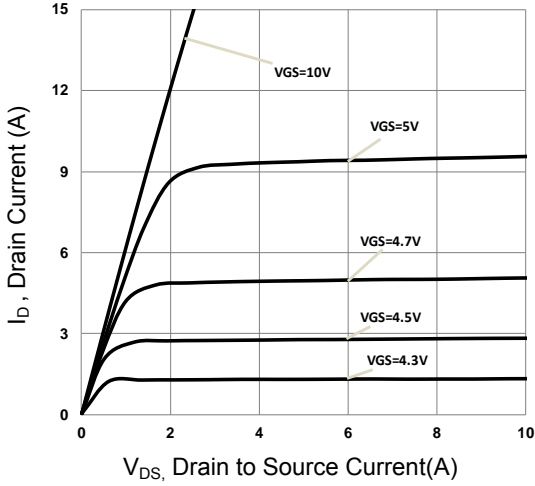


Figure 1. Typical Output Characteristics

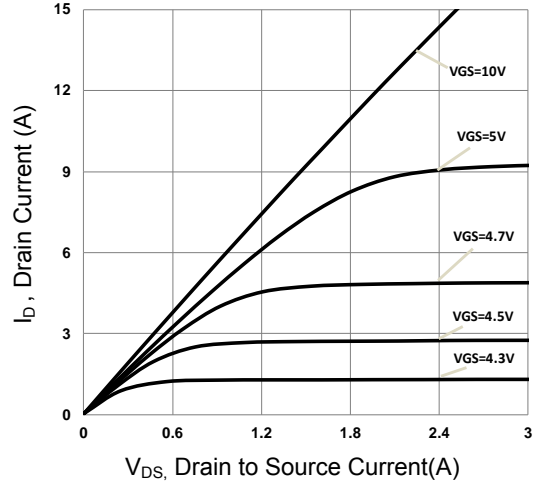


Figure 2. Typical Output Characteristics

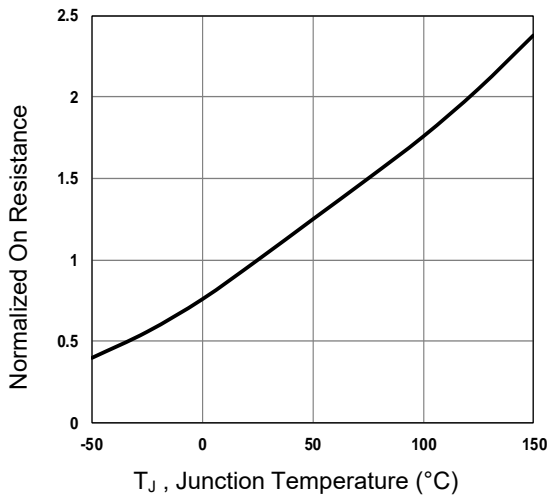


Figure 3. Normalized $R_{DS(ON)}$ vs. T_J

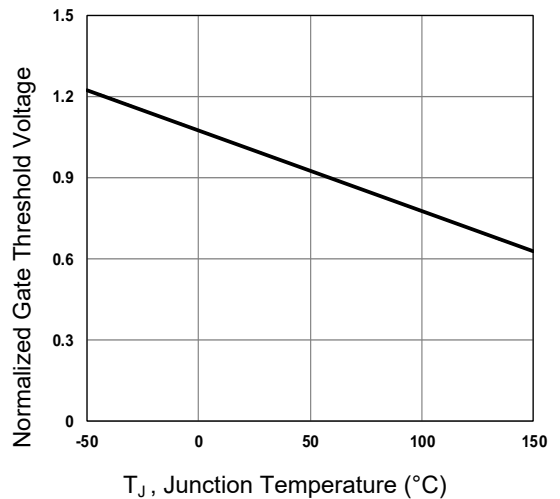


Figure 4. Normalized V_{th} vs. T_J

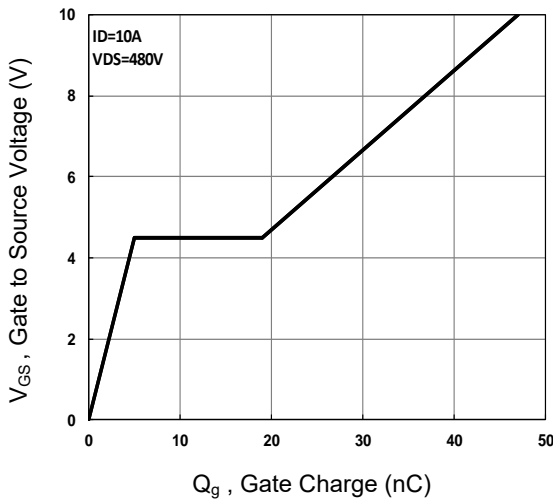


Figure 5. Gate Charge Waveform

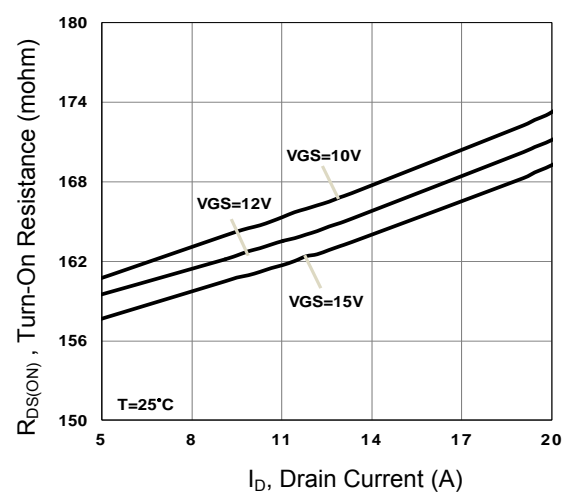


Figure 6. Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

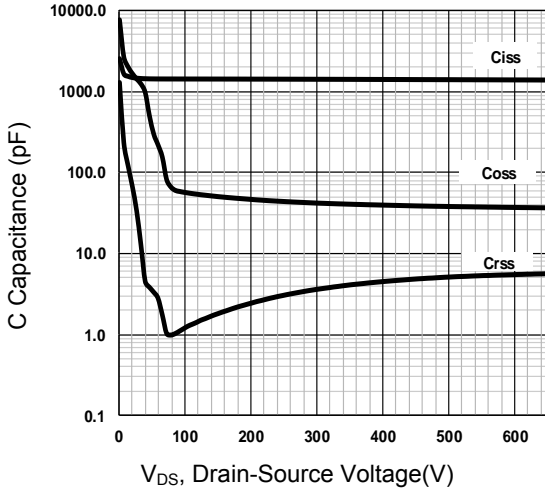


Figure 7. Capacitance vs. V_{DS}

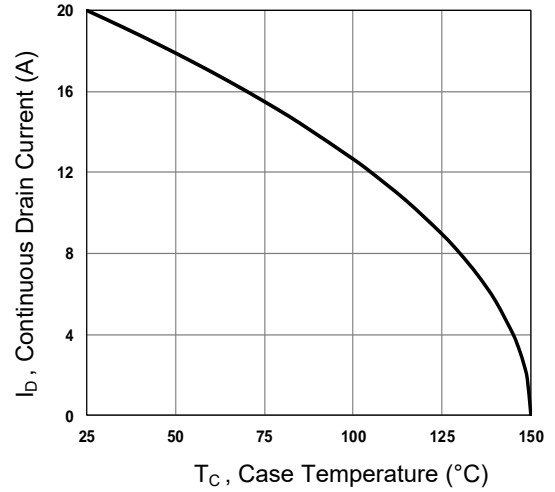


Figure 8. Continuous Drain Current vs. T_c

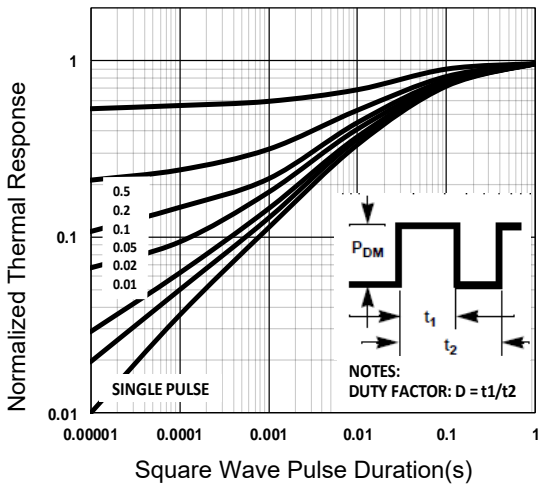


Figure 9. Normalized Transient Impedance

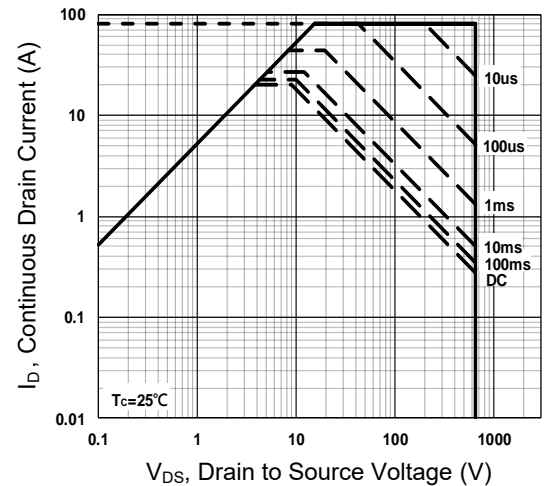


Figure 10. Maximum Safe Operation Area

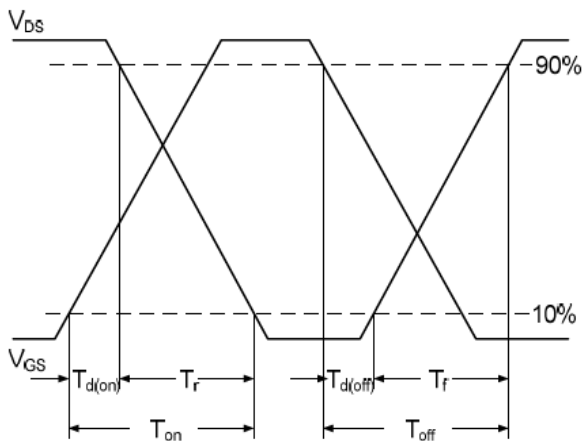


Figure 11. Switching Time Waveform

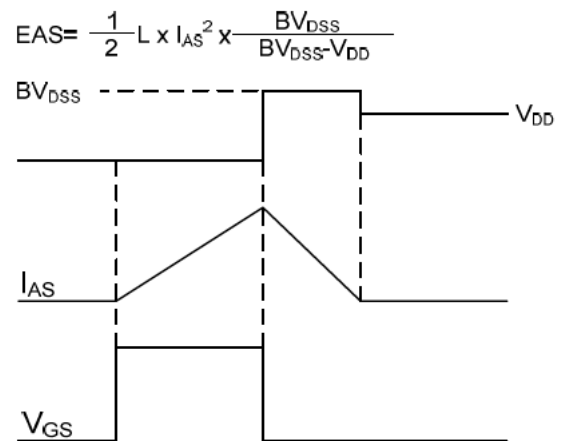
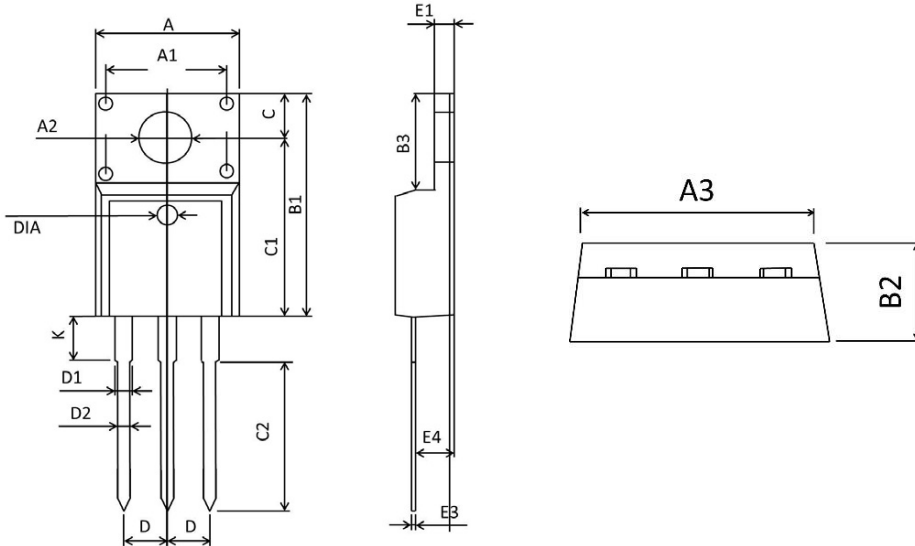


Figure 12. EAS Waveform

Package Outline Dimensions (TO-220F)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	9.860	10.460	0.389	0.411
A1	6.900	7.100	0.272	0.280
A2	3.100	3.500	0.122	0.138
B1	15.450	16.300	0.608	0.642
B2	4.400	5.000	0.173	0.197
B3	6.280	7.100	0.247	0.280
C	3.100	3.500	0.122	0.138
C1	12.270	12.870	0.483	0.507
C2	9.600	10.520	0.378	0.414
D	2.540BSC		0.1BSC	
D1	1.070	1.470	0.042	0.058
D2	0.600	1.000	0.024	0.039
K	2.800	3.500	0.110	0.138
E1	2.340	2.740	0.092	0.108
E3	0.350	0.650	0.014	0.026
E4	2.460	2.960	0.097	0.117
DIA	1.35	1.65	0.053	0.065

Order Information

Device	Package	Marking	Quantity	HSF Status
GSFU6522	TO-220F	JF20N65N	50pcs / Tube	RoHS Compliant