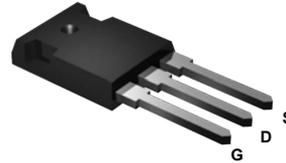
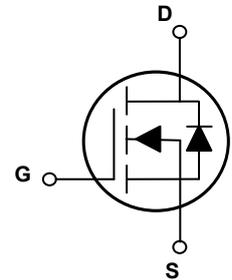


Main Product Characteristics

BV_{DSS}	950V
$R_{DS(ON)}$	500m Ω (Max)
I_D	10A



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



Description

The GSFA95R500 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, EV Charger, motor driver and a wide variety of other applications.

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	950	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current, T _C =25°C ¹	I_D	10	A
Continuous Drain Current, T _C =100°C ¹		6.3	
Pulsed Drain Current, T _C =25°C ²	$I_{D,pulse}$	30	A
Continuous Diode Forward Current, T _C =25°C ¹	I_S	10	A
Diode Pulsed Current, T _C =25°C ²	$I_{S,pulse}$	30	A
Power Dissipation, T _C =25°C ³	P_D	151	W
Single Pulsed Avalanche Energy ⁴	E_{AS}	165	mJ
MOSFET dv/dt Ruggedness, V _{DS} =0 to 480V	dv/dt	50	V/ns
Reverse Diode dv/dt, V _{DS} =0 to 480V, I _{SD} ≤I _D		15	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.83	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62	°C/W
Operation and Storage Temperature Range	T _{stg} , T _J	-55 to +150	°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}	$V_{GS}=0V, I_D=250\mu A$	950	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.9	-	3.9	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=950V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V$	-	-	± 100	nA
Drain-Source On State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5A$	-	0.43	0.50	Ω
		$V_{GS}=10V, I_D=5A$ $T_J=150^{\circ}\text{C}$	-	1.6	-	
Gate Resistance	R_G	$f=1\text{MHz}$, Open drain	-	18	-	Ω
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS}=400V, I_D=6A$ $V_{GS}=10V$	-	24	-	nC
Gate-Source Charge	Q_{gs}		-	9.4	-	
Gate-Drain Charge	Q_{gd}		-	3.3	-	
Gate Plateau Voltage	$V_{plateau}$		-	5.6	-	V
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=400V, R_G=2\Omega$ $V_{GS}=10V, I_D=6A$	-	33.6	-	nS
Rise Time	t_r		-	16.2	-	
Turn-Off Delay Time	$t_{d(off)}$		-	54.4	-	
Fall Time	t_f		-	6.2	-	
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V$ $f=100\text{KHz}$	-	1568	-	pF
Output Capacitance	C_{oss}		-	66	-	
Reverse Transfer Capacitance	C_{rss}		-	1.9	-	
Effective Output Capacitance, Energy Related	$C_{o(er)}$	$V_{GS}=0V$, $V_{DS}=0V-400V$	-	40	-	
Effective Output Capacitance, Time Related	$C_{o(tr)}$		-	185	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=10A$	-	-	1.3	V
Reverse Recovery Time	t_{rr}	$V_R=400V$ $I_S=6A$, $di/dt=100A/\mu s$	-	268	-	nS
Reverse Recovery Charge	Q_{rr}		-	3.2	-	μC
Peak Reverse Recovery Current	I_{rrm}		-	20.8	-	A

Note:

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. P_d is based on max. junction temperature, using junction-case thermal resistance.
4. $V_{DD}=100V, V_{GS}=10V, L=75\text{mH}$, starting $T_J=25^{\circ}\text{C}$.

Typical Electrical and Thermal Characteristic Curves

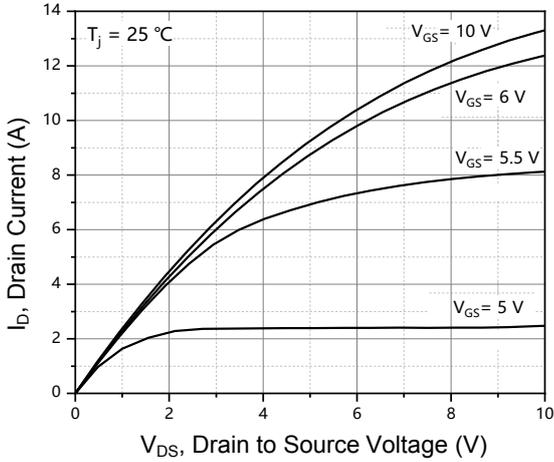


Figure 1. Typical Output Characteristics

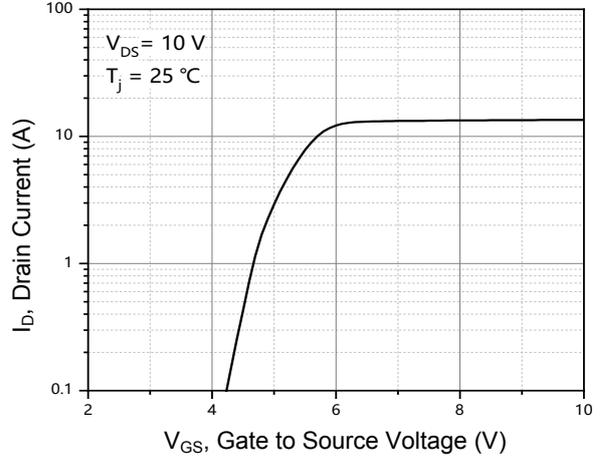


Figure 2. Typical Transfer Characteristics

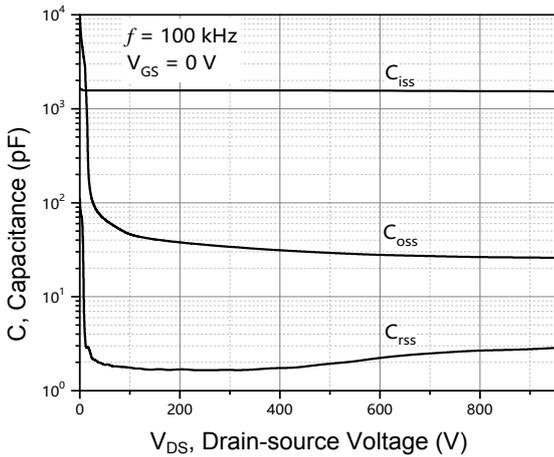


Figure 3. Typical Capacitances

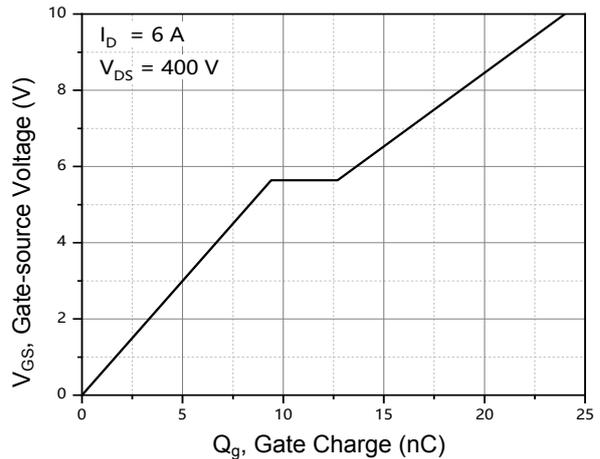


Figure 4. Typical Gate Charge

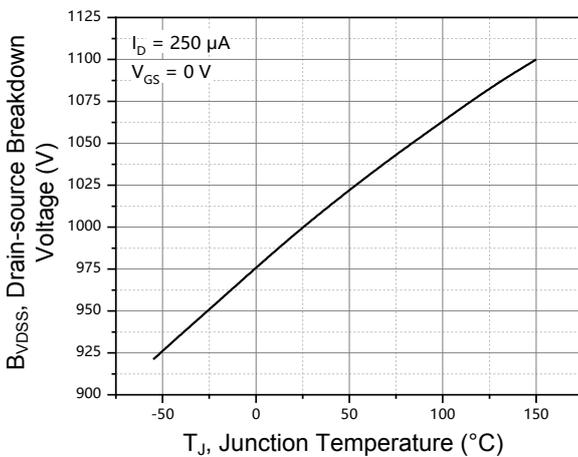


Figure 5. Drain-source breakdown voltage

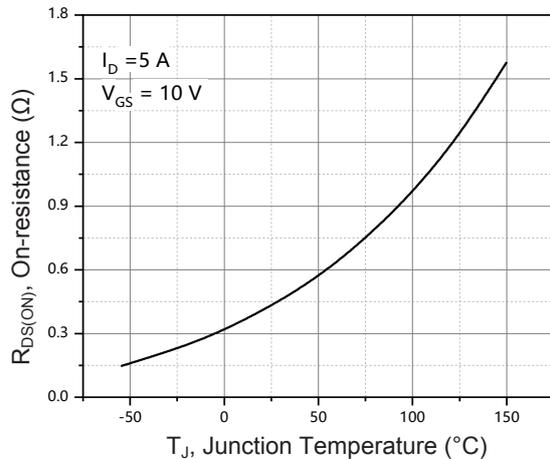


Figure 6. Drain-source on-state resistance

Typical Electrical and Thermal Characteristic Curves

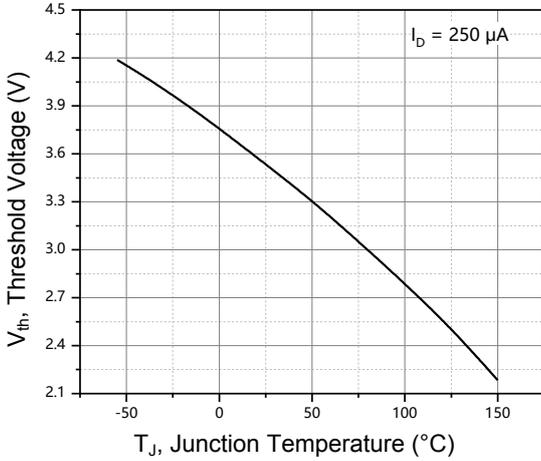


Figure 7. Threshold voltage

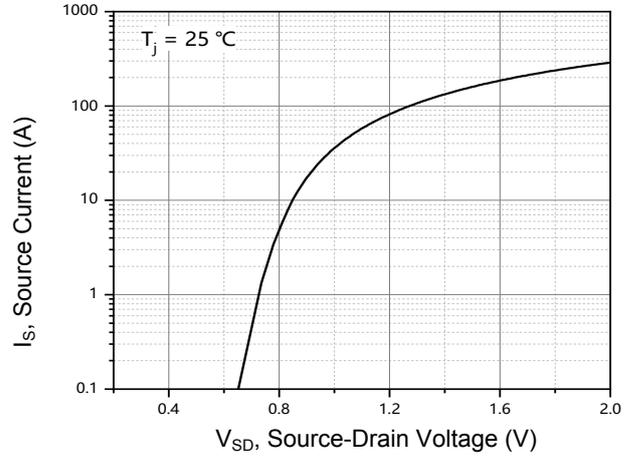


Figure 8. Forward characteristic of body diode

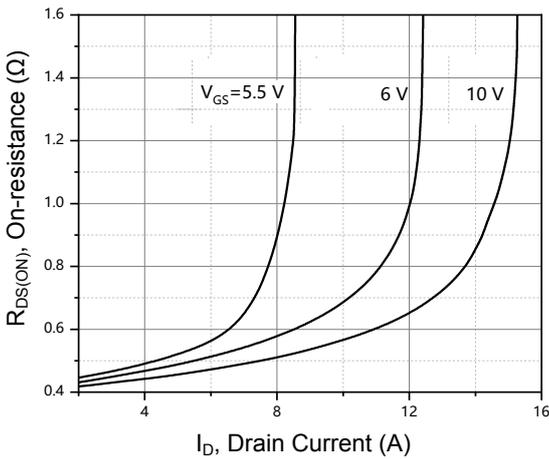


Figure 9. Drain-source on-state resistance

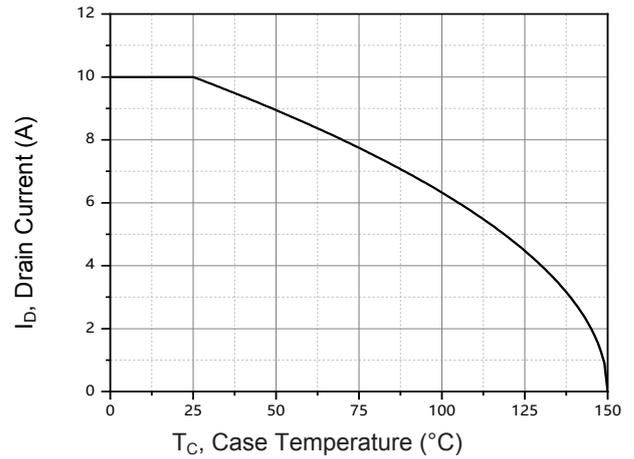


Figure 10. Drain current

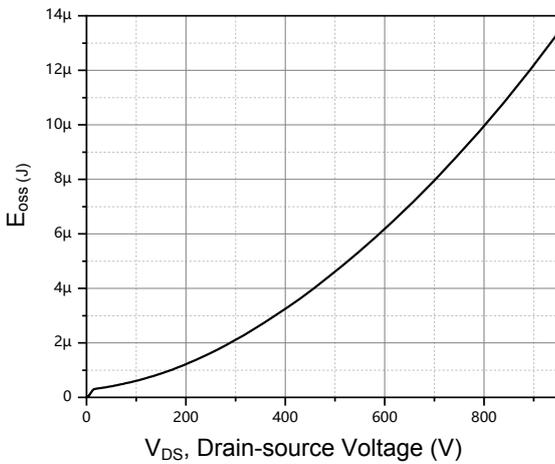


Figure 11. Typical Coss stored energy

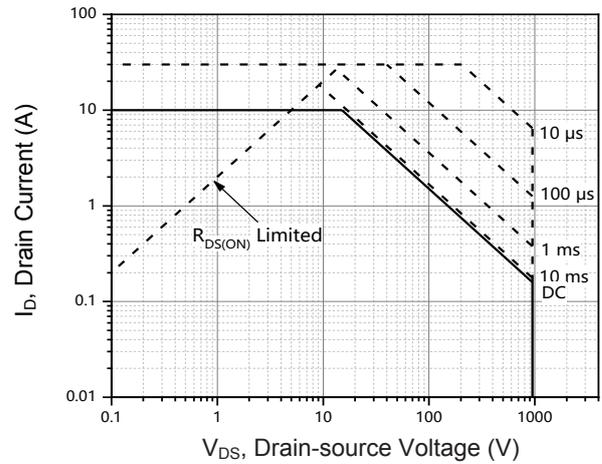


Figure 12. Safe operation area $T_c=25^\circ\text{C}$

Typical Electrical and Thermal Characteristic Curves

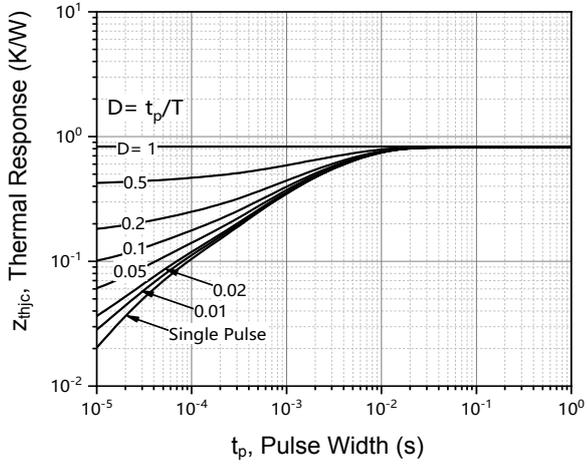
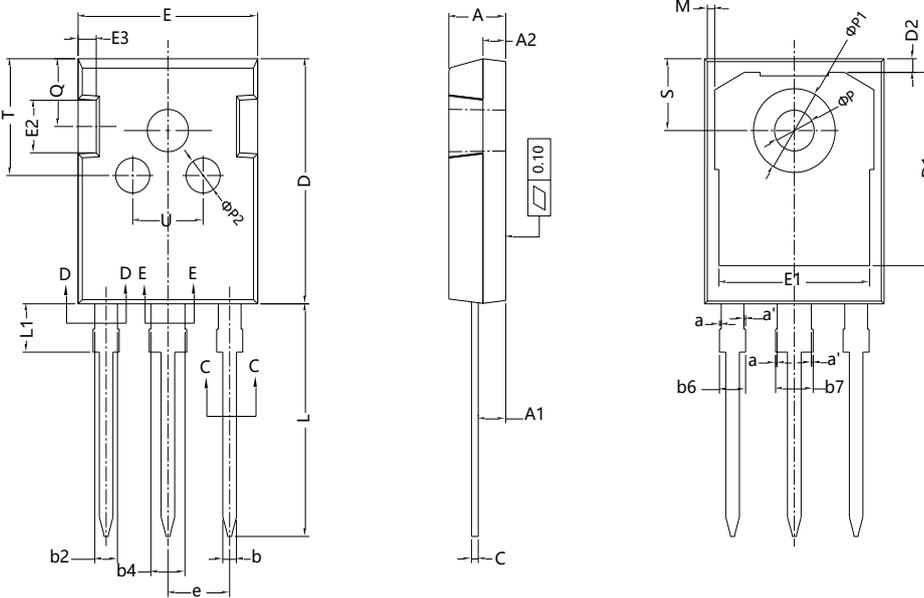


Figure 13. Max. Transient Thermal Impedance

Package Outline Dimensions (TO-247-J)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	4.90	5.10	0.193	0.201
A1	2.31	2.51	0.091	0.099
A2	1.90	2.10	0.075	0.083
a	0.00	0.15	0.000	0.006
a'	0.00	0.15	0.000	0.006
b	1.16	1.26	0.046	0.050
b2	1.96	2.06	0.077	0.081
b4	2.96	3.06	0.117	0.120
b6	-	2.25	-	0.089
b7	-	3.25	-	0.128
c	0.59	0.66	0.023	0.026
D	20.90	21.10	0.823	0.831
D1	16.25	16.85	0.640	0.663
D2	1.05	1.35	0.041	0.053
E	15.70	15.90	0.618	0.626
E1	13.10	13.50	0.516	0.531
E2	4.40	4.60	0.173	0.181
E3	1.50	1.70	0.059	0.067
e	5.436 BSC		0.214 BSC	
L	19.80	20.10	0.780	0.791
L1	-	4.30	-	0.169
M	0.35	0.95	0.014	0.037
P	3.40	3.60	0.134	0.142
P1	7.00	7.40	0.276	0.291
P2	2.40	2.60	0.094	0.102
Q	5.60	6.00	0.220	0.236
S	6.05	6.25	0.238	0.246
T	9.80	10.20	0.386	0.402
U	6.00	6.40	0.236	0.252