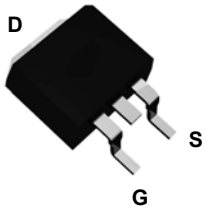
GOOD-ARK SEMICONDUCTOR

GSFT7R515

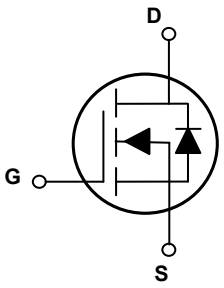
150V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	150V
$R_{DS(ON)}$	5.4mΩ (Typ.)
I_D	175A



TO-263 (D^2PAK)



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 GSFT7R515 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_C=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_C=25°C)[1]	I_D	175	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		124	A
Pulsed Drain Current[2]	I_{DM}	690	A
Power Dissipation (T_A=25°C)	P_D	376	W
Linear Derating Factor (T_A=25°C)		2.5	W/°C
Single Pulse Avalanche Energy[3]	E_{AS}	803	mJ
Junction-to-Case	$R_{\theta JC}$	0.4	°C/W
Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	62.5	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +175	°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	150	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=150V, V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	50	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=20V	-	-	100	nA
		V_{GS}=-20V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=100A	-	5.4	7.5	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2.1	3	3.9	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V F=1MHz	-	5400	-	pF
Output Capacitance	C_{oss}		-	3300	-	
Reverse Transfer Capacitance	C_{rss}		-	80	-	
Total Gate Charge	Q_g	I_D=100A, V_{DS}=120V, V_{GS}=10V	-	81	-	nC
Gate-to-Source Charge	Q_{gs}		-	29	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	15	-	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=75V, I_D=80A, R_{GEN}=2.5Ω	-	16.5	-	nS
Rise Time	t_r		-	106.3	-	
Turn-Off Delay Time	$t_{d(off)}$		-	60.6	-	
Fall Time	t_f		-	104.6	-	
Gate Resistance	R_g	F=1MHz	-	4.3	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	175	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	690	A
Diode Forward Voltage	V_{SD}	I_S=80A, V_{GS}=0V	-	1	1.2	V
Reverse Recovery Time	T_{rr}	T_J=25°C, I_F=80A, di/dt=100A/μs	-	110	-	nS
Reverse Recovery Charge	Q_{rr}		-	0.36	-	μC

Note:

1. Pulse test: pulse width ≤300us, duty cycle ≤2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=0.3mH, R_G=25Ω, V_{DD}=50V, T_J=25°C.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

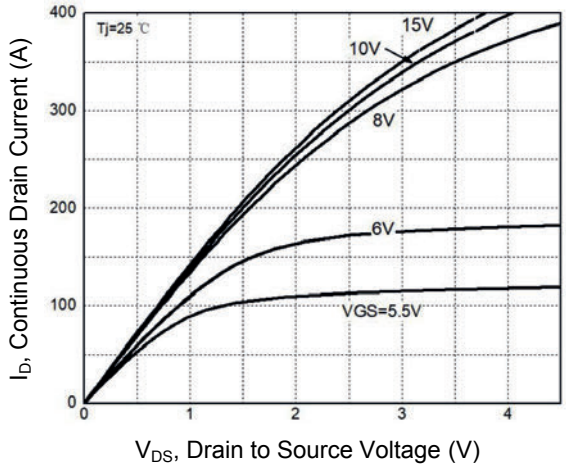


Figure 1. Typical Output Characteristics

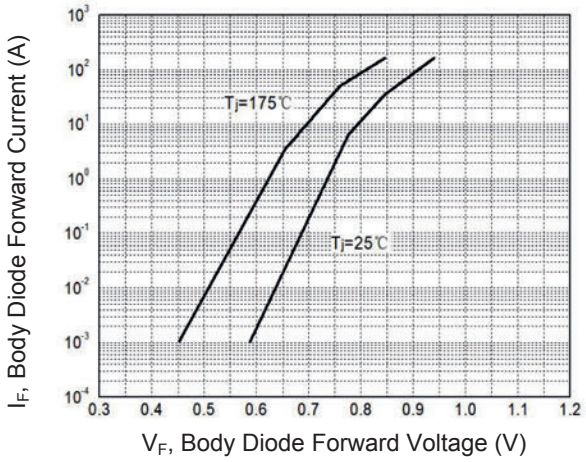


Figure 2. Body Diode Characteristics

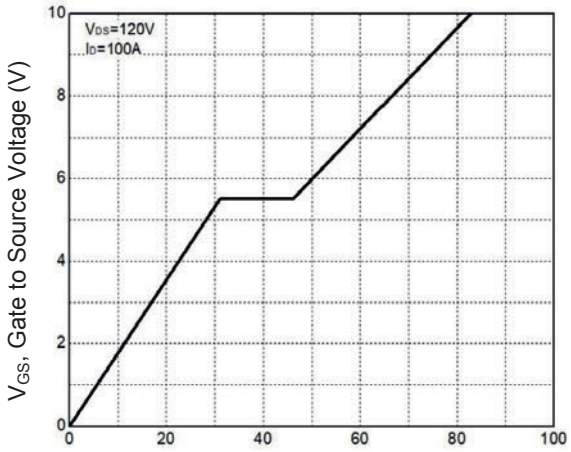


Figure 3. Gate Charge

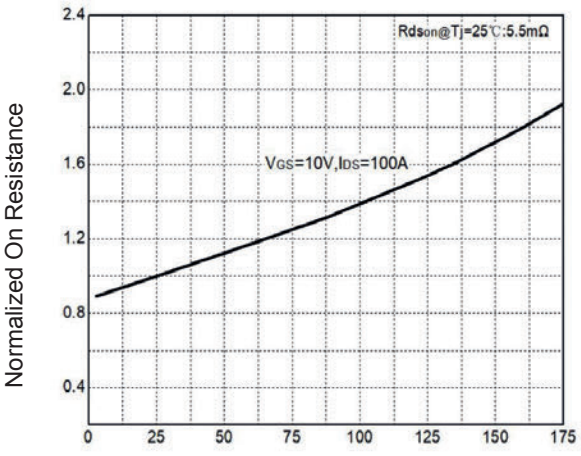


Figure 4. Normalized On-Resistance vs. T_J

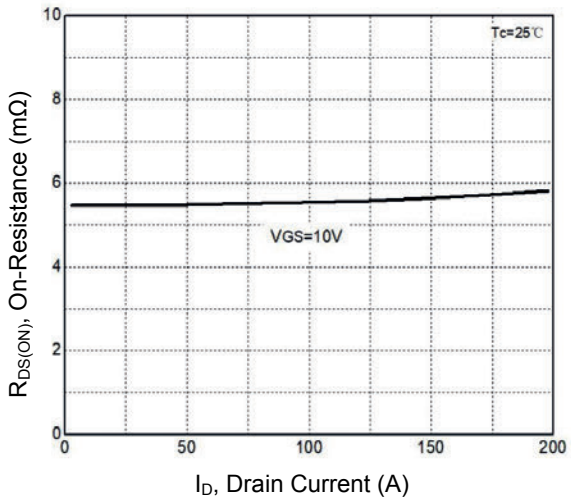


Figure 5. Drain-Source On-Resistance

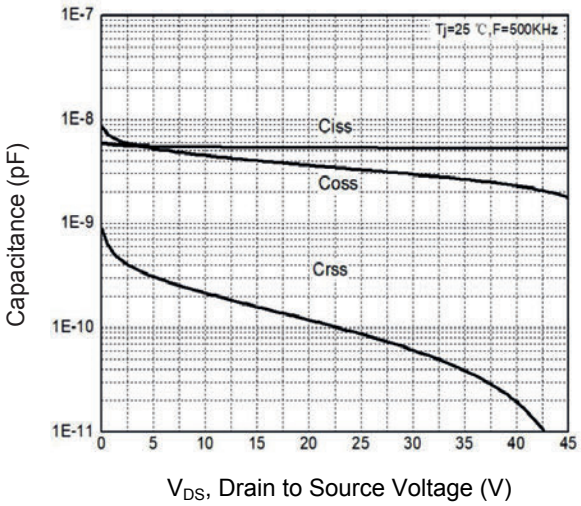


Figure 6. Typical Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

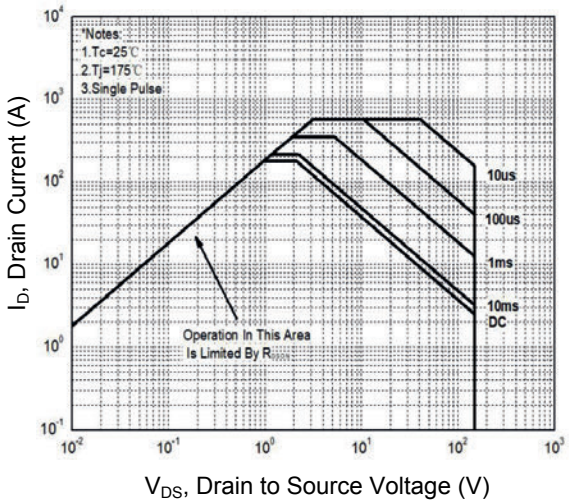


Figure 7. Safe Operation Area

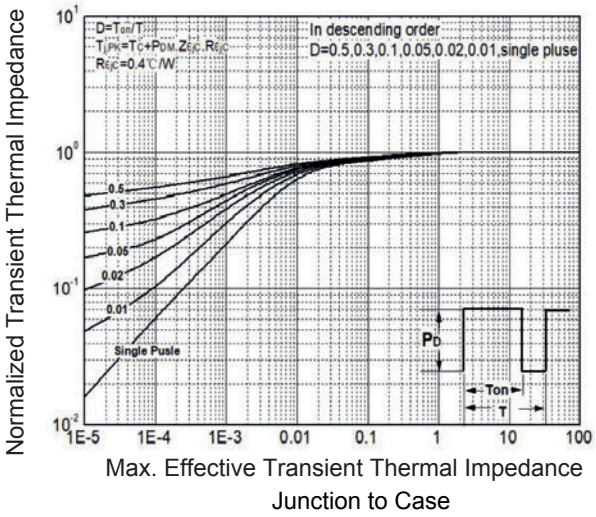
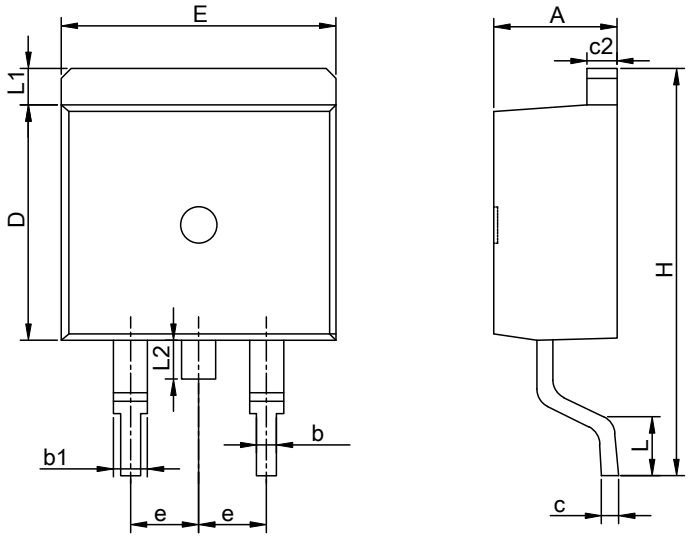


Figure 8. Thermal Transient Impedance

Package Outline Dimensions TO-263 (D^2PAK)



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	Carrier	Quantity
GSFT7R515	TO-263 (D^2PAK)	T7R515	Tape & Reel	800 Pcs / Reel