

### General Description

The IRF4905S uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. These features combine to make this design an extremely efficient and reliable device for use in a wide variety of other applications.

### Features

- P-Channel
- Fast Switching
- RoHS Compliant
- Advanced Process Technology

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-55	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	-90	A
$I_{DM}$	Pulsed Drain Current	-270	A
EAS	Single Pulse Avalanche Energy	1150	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	170	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	40	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.75	$^\circ C/W$

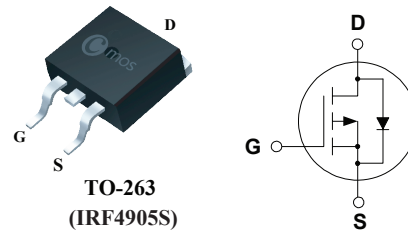
### Product Summary

BVDSS	RDSON	ID
-55V	7m $\Omega$	-90A

### Applications

- Inverters
- Motor drive
- DC / DC converter

### TO-263 Pin Configuration



**Electrical Characteristics (T<sub>J</sub>=25°C , unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =-250uA	-55	---	---	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A	---	---	7	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A	---	---	10	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1	---	-2.5	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-55V , V <sub>GS</sub> =0V	---	---	-100	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-10A	---	27	---	S
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> = -42A	---	120	---	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> = -44V	---	30	---	
Q <sub>gd</sub>	Gate-Drain Charge	V <sub>GS</sub> = -10V	---	55	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> = -28V	---	20	---	ns
T <sub>r</sub>	Rise Time	I <sub>D</sub> = -42A	---	100	---	
T <sub>d(off)</sub>	Turn-Off Delay Time	R <sub>G</sub> = 2.6Ω	---	50	---	
T <sub>f</sub>	Fall Time	V <sub>GS</sub> = -10V	---	65	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = -25V, V <sub>GS</sub> = 0V , f = 1MHz	---	12000	---	pF
C <sub>oss</sub>	Output Capacitance		---	1000	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	450	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	-90	A
I <sub>SM</sub>	Pulsed Source Current		---	---	-270	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>S</sub> =-10A , T <sub>J</sub> =25°C	---	---	-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> = -42V, T <sub>J</sub> = 25°C, V <sub>DD</sub> = -28V	---	60	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt = 100 A/μs	---	150	---	nC

Notes:

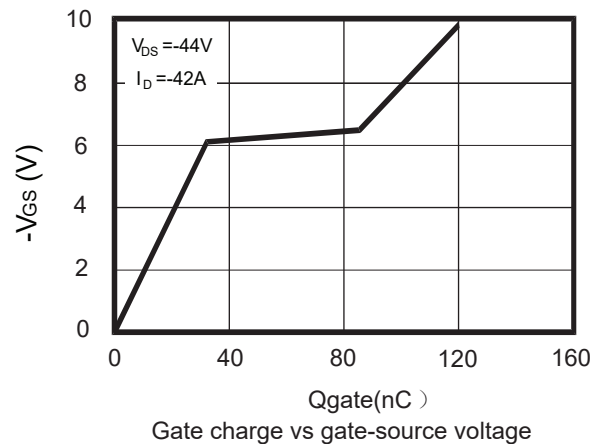
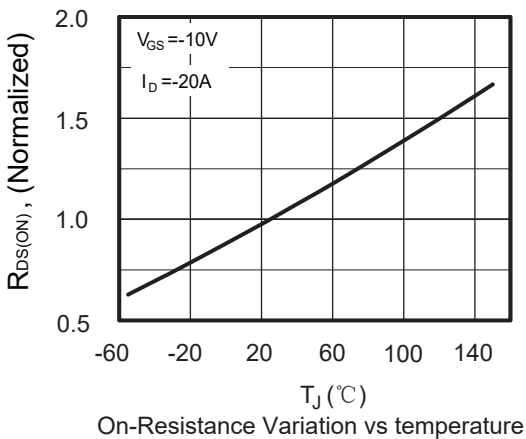
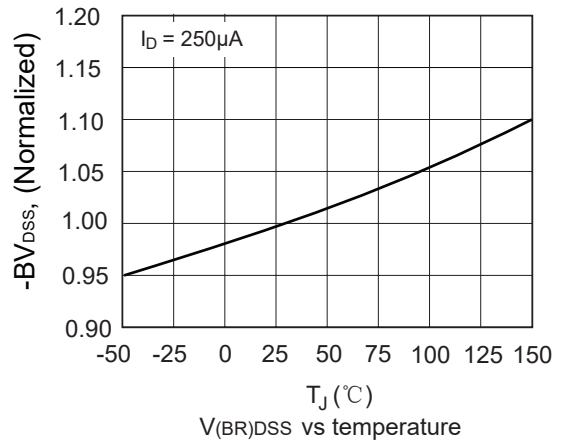
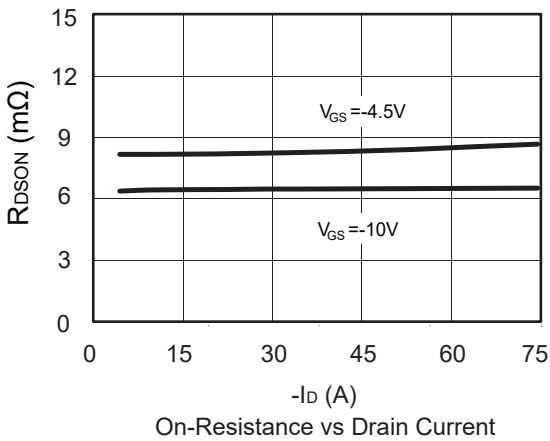
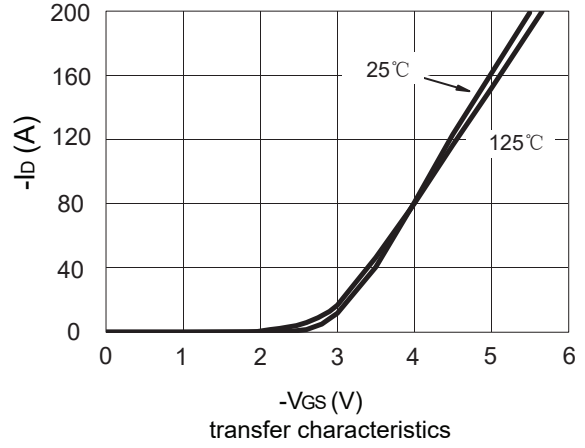
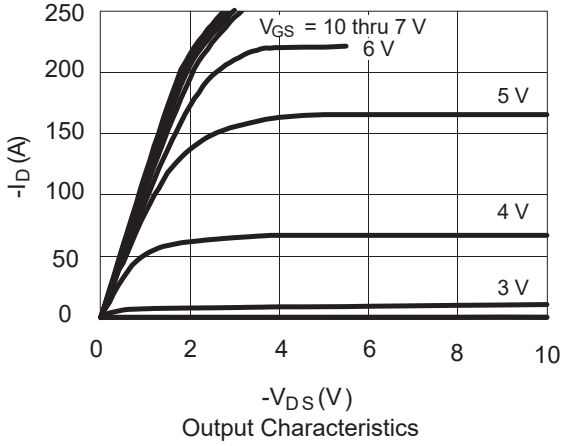
1. The test condition is V<sub>DS</sub>=-30V , V<sub>GS</sub>=-10V , L=3mH, I<sub>D</sub> =-29A.

This product has been designed and qualified for the consumer market.

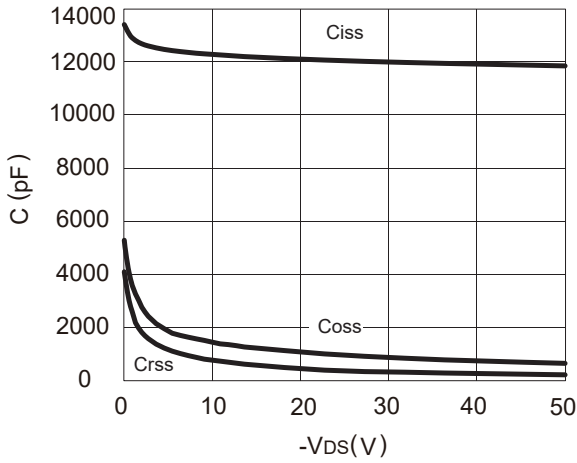
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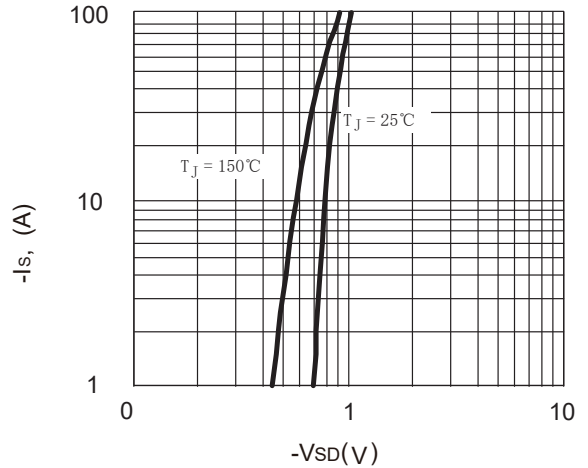
Typical Characteristics



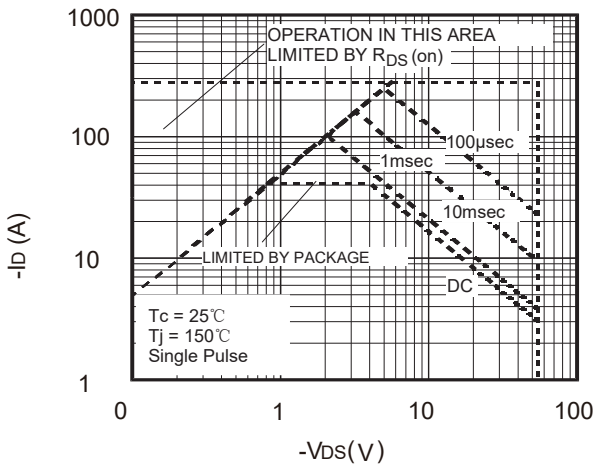
Typical Characteristics



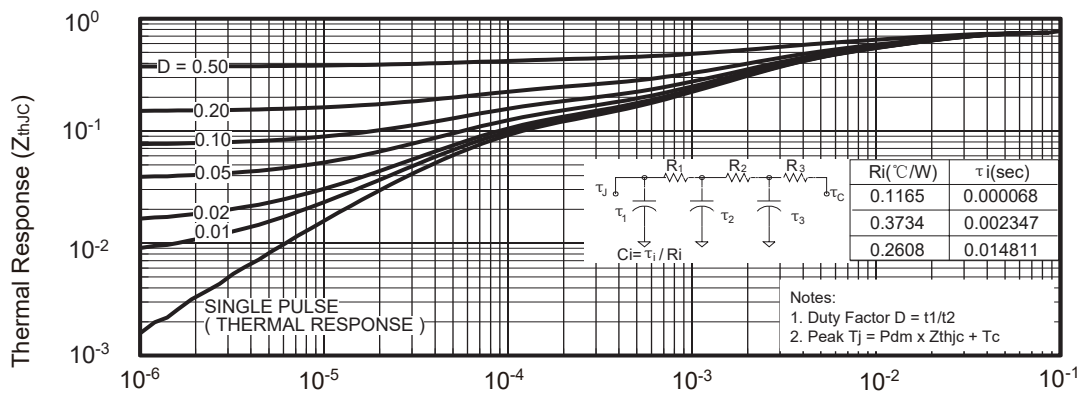
Capacitance Characteristics



Body-Diode Characteristics



Safe operating area



Maximum Effective Transient Thermal Impedance, Junction-to-Case