



## General Description

The IRF100S201 use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness and suitable to use in

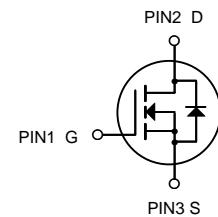


TO-263

## General Features

$V_{DS} = 100V$   $I_D = 260A$

$R_{DS(ON)} < 2.8m\Omega @ V_{GS} = 10V$



N-Channel MOSFET

## Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications

## Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IRF100S201	TO-263	HXY MOSFET	800

## Absolute Maximum Ratings at $T_j = 25^\circ C$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	$T_C = 25^\circ C$	260
		$T_C = 100^\circ C$	163
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	1028	A
Single Pulse Avalanche Energy <sup>2</sup>	<b>EAS</b>	583	mJ
Total Power Dissipation	$T_C = 25^\circ C$	$P_D$	379
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$
Thermal Resistance from Junction-to-Ambient <sup>3</sup>	$R_{\theta JA}$	59	$^\circ C/W$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	0.33	$^\circ C/W$



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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	100	-	-	V
Gate-body Leakage current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	T <sub>J</sub> = 25°C	-	1	μA
			T <sub>J</sub> = 100°C	-	100	
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	2	3	4	V
Drain-Source on-Resistance <sup>4</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A	-	2.4	2.8	mΩ
Forward Transconductance <sup>4</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 20A	-	76	-	S
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz	-	9030	-	pF
Output Capacitance	C <sub>oss</sub>		-	1505	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	40	-	
Gate Resistance	R <sub>g</sub>	f = 1MHz	-	2.3	-	Ω
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 50V, I <sub>D</sub> = 20A	-	150	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	32.5	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	49	-	
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 50V, R <sub>G</sub> = 3Ω, I <sub>D</sub> = 20A	-	27	-	ns
Rise Time	t <sub>r</sub>		-	78.5	-	
Turn-off Delay Time	t <sub>d(off)</sub>		-	110	-	
Fall Time	t <sub>f</sub>		-	86	-	
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 20A, dI/dt = 100A/μs	-	88	-	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	220	-	nC
Diode Forward Voltage <sup>4</sup>	V <sub>SD</sub>	I <sub>D</sub> = 20A, V <sub>GS</sub> = 0V	-	-	1.2	V
Continuous Source Current	I <sub>S</sub>	T <sub>C</sub> = 25°C	-	-	260	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub> = 150°C.
2. The EAS data shows Max. rating . The test condition is V<sub>DD</sub> = 50V, V<sub>GS</sub> = 10V, L = 0.4mH, I<sub>AS</sub> = 54A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.



### Typical Characteristics

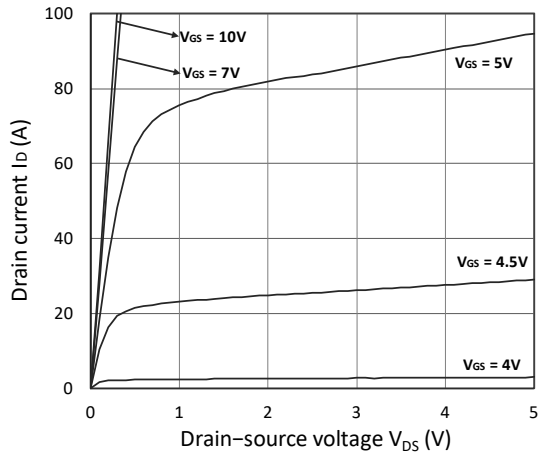


Figure 1. Output Characteristics

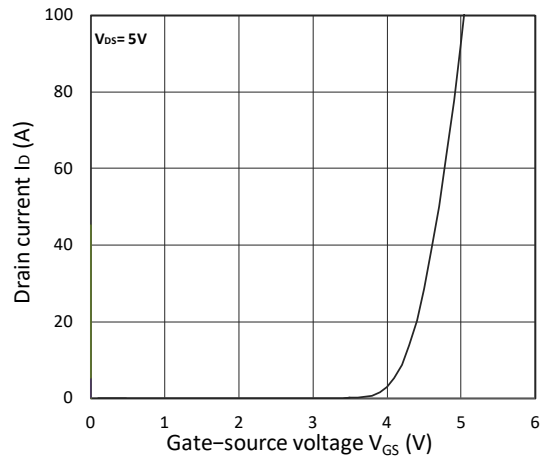


Figure 2. Transfer Characteristics

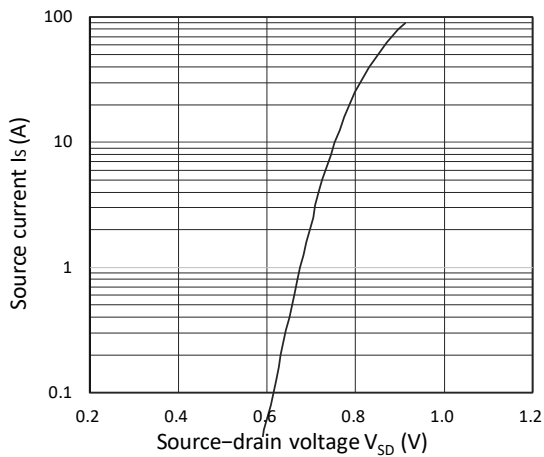


Figure 3. Forward Characteristics of Reverse

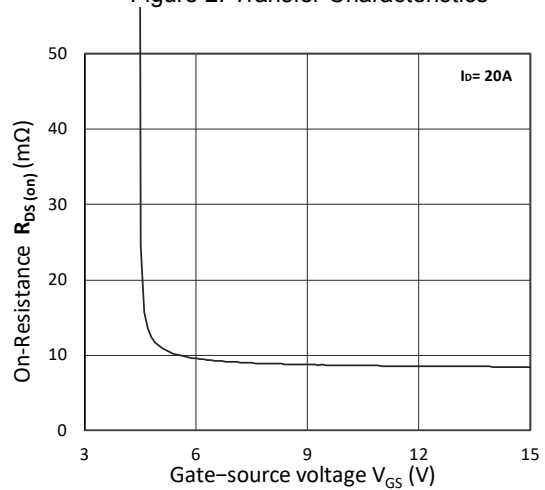


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

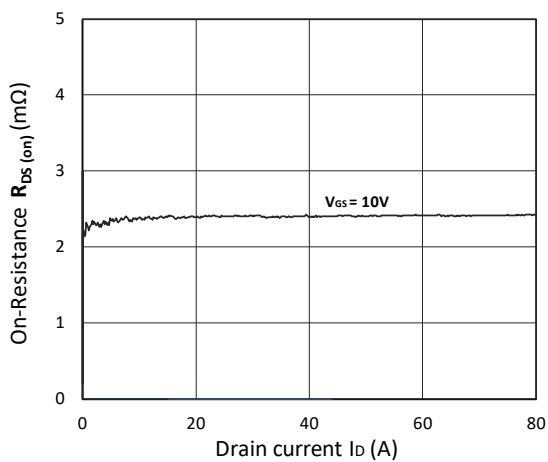


Figure 5.  $R_{DS(ON)}$  vs.  $I_D$

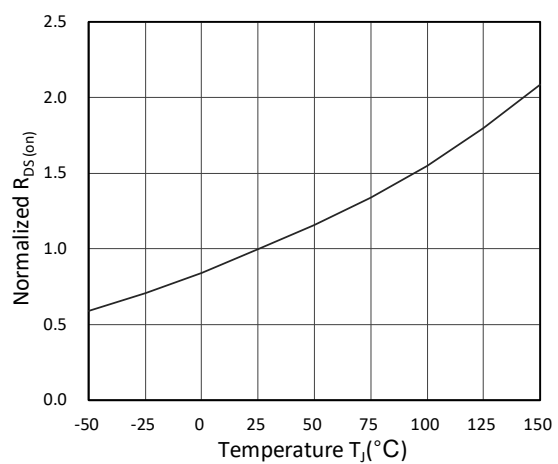


Figure 6. Normalized  $R_{DS(ON)}$  vs. Temperature

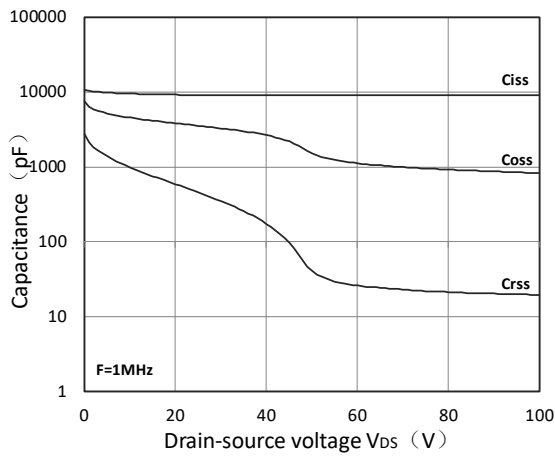


Figure 7. Capacitance Characteristics

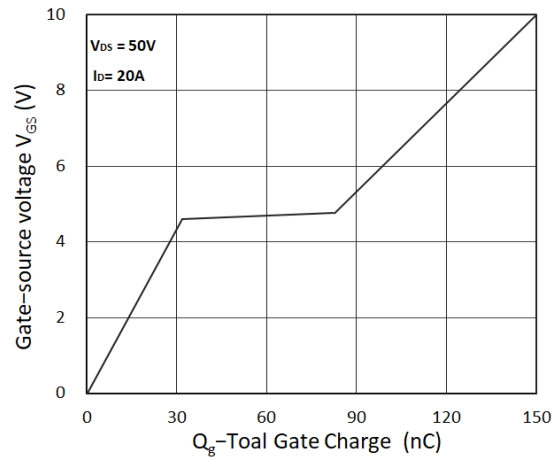


Figure 8. Gate Charge Characteristics

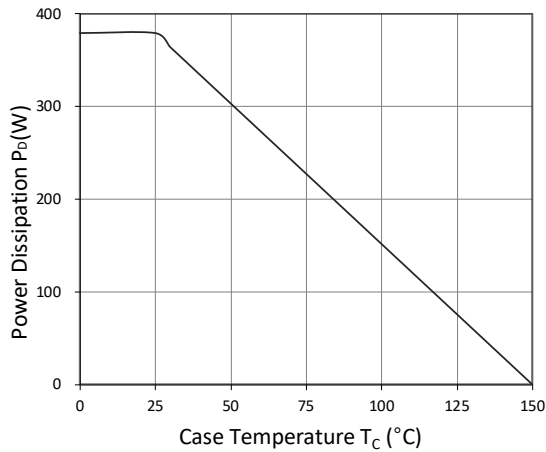


Figure 9. Power Dissipation

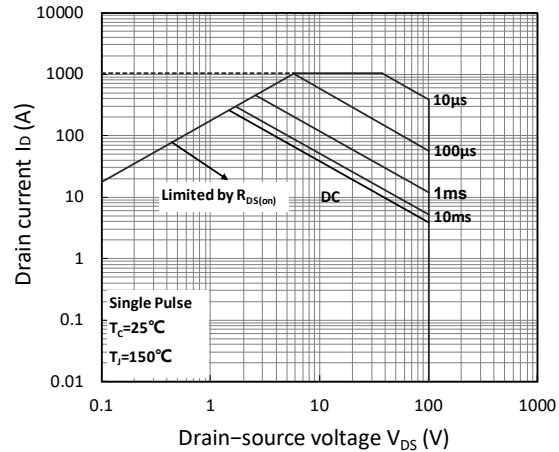


Figure 10. Safe Operating Area

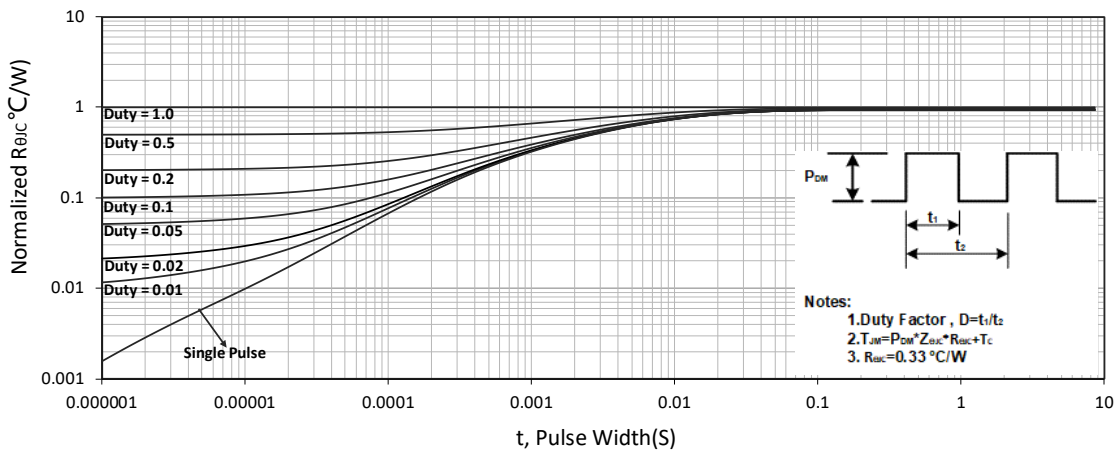


Figure 11. Normalized Maximum Transient Thermal Impedance



### Test Circuit

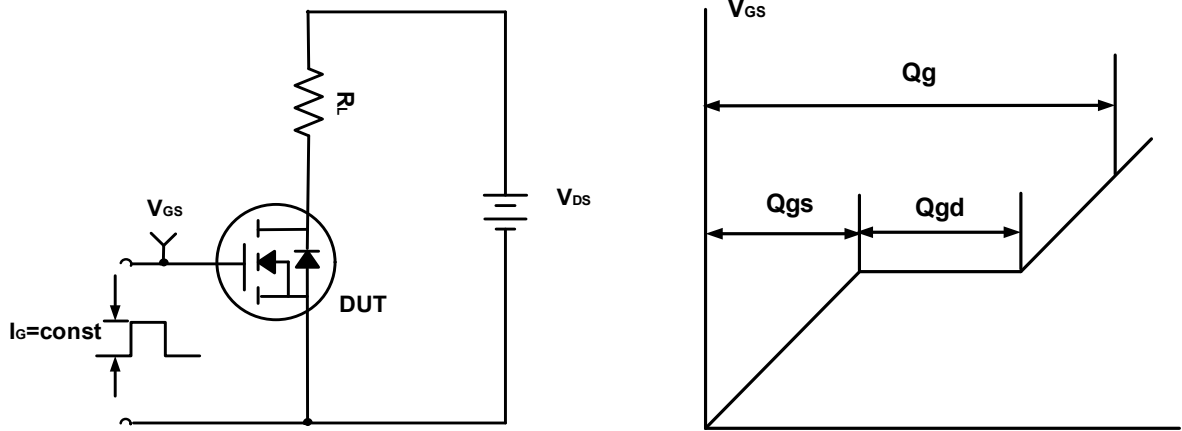


Figure A. Gate Charge Test Circuit & Waveforms

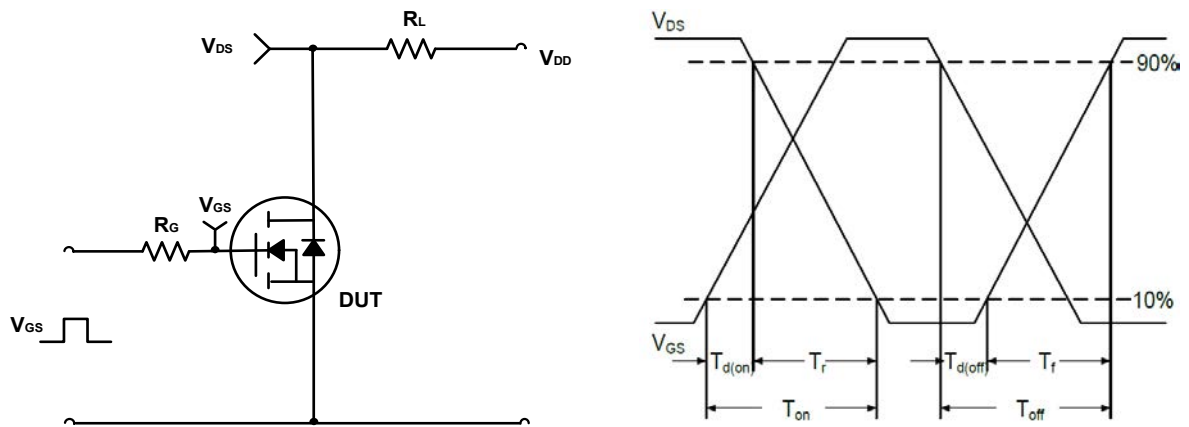


Figure B. Switching Test Circuit & Waveforms

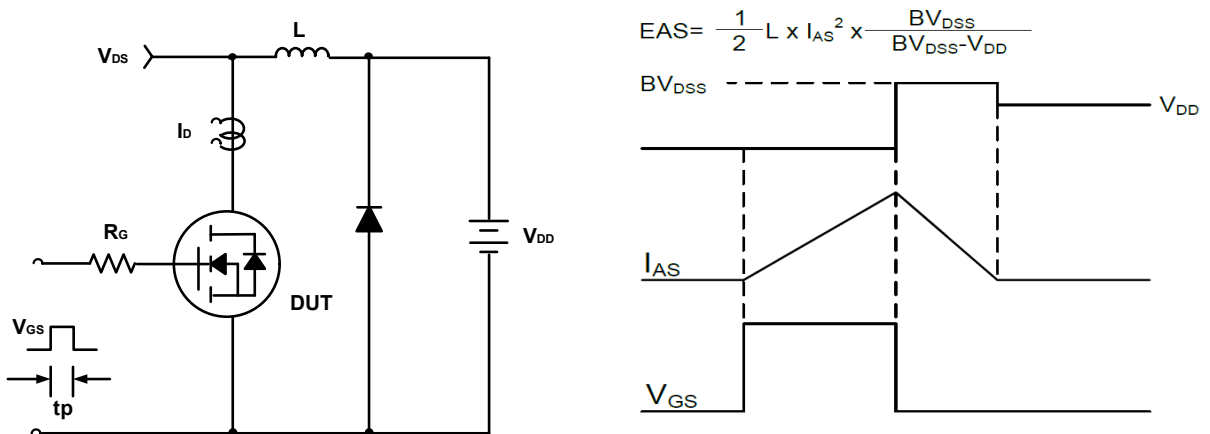
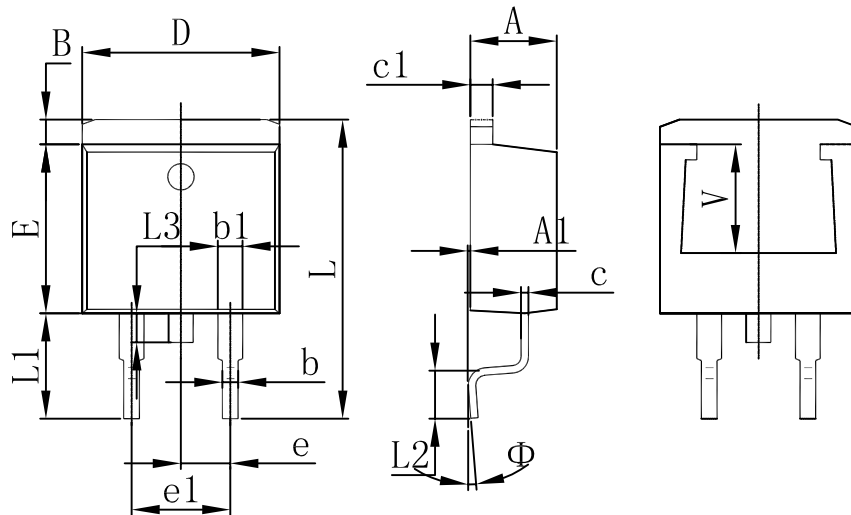


Figure C. Unclamped Inductive Switching Circuit & Waveforms



TO-263 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220REF.	



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