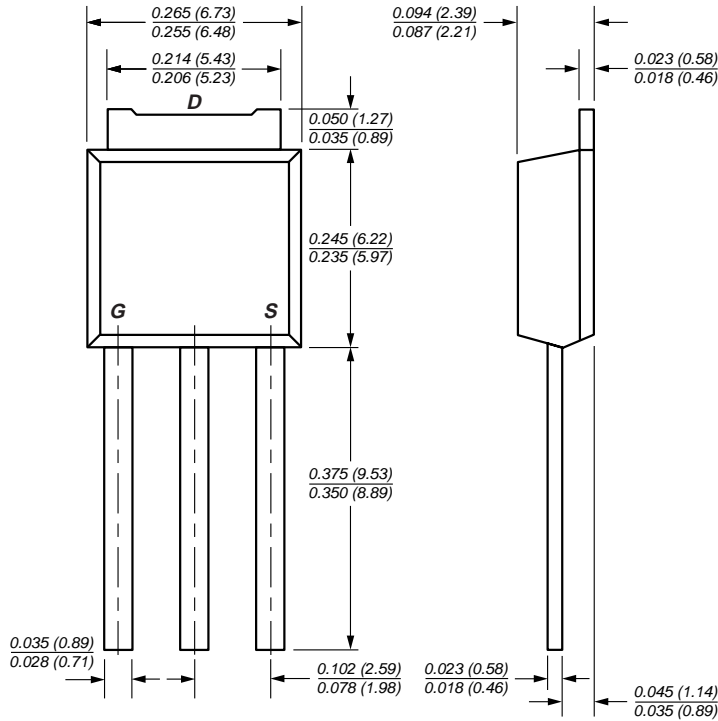
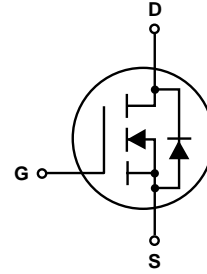


# N-Channel Enhancement-Mode MOSFET

V<sub>DS</sub> 30V  
R<sub>DS(ON)</sub> 9mΩ  
I<sub>D</sub> 65A

TO-251 (IPAK)

TRENCH  
GENFET™



Dimensions in inches and (millimeters)

## Features

- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Specially Designed for Low Voltage DC/DC Converters and motor drives
- Fast Switching for High Efficiency

## Mechanical Data

**Case:** JEDEC TO-251 molded plastic body

**Terminals:** Solder plated, solderable per MIL-STD-750, Method 2026

**High temperature soldering guaranteed:** 250°C/10 seconds at terminals

**Weight:** 0.011oz., 0.4g

## Maximum Ratings and Thermal Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

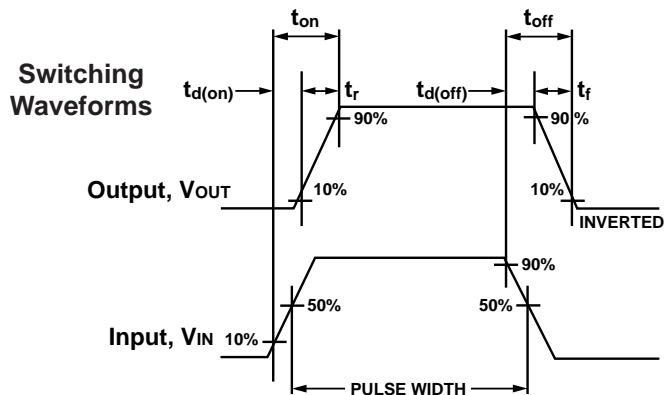
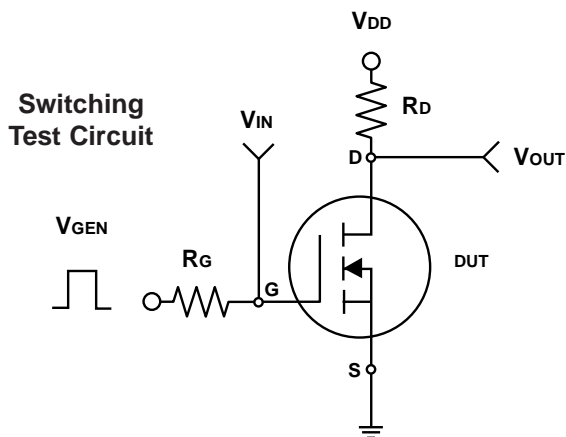
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	
Continuous Drain Current <sup>(1)</sup>	I <sub>D</sub>	65	A
Pulsed Drain Current	I <sub>DM</sub>	150	
Maximum Power Dissipation	P <sub>D</sub>	T <sub>C</sub> = 25°C 62.5	W
		T <sub>C</sub> = 100°C 25.0	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to 150	°C
Junction-to-Case Thermal Resistance	R <sub>θJC</sub>	2.0	°C/W
Junction-to-Ambient Thermal Resistance	R <sub>θJA</sub>	110	°C/W

**Notes:** (1) Maximum DC current limited by the package.

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

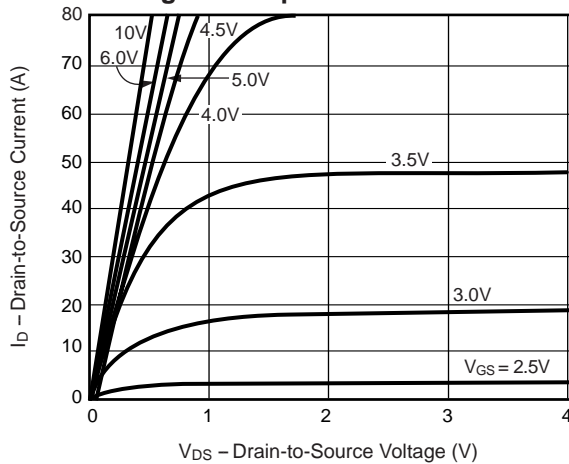
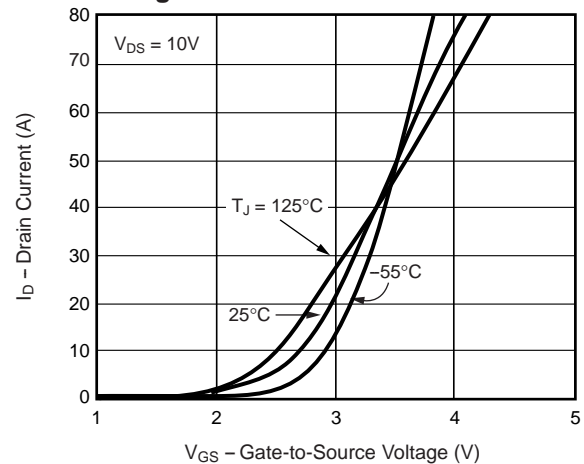
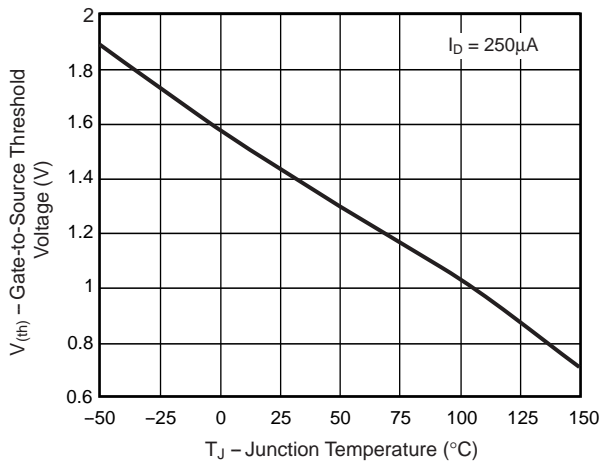
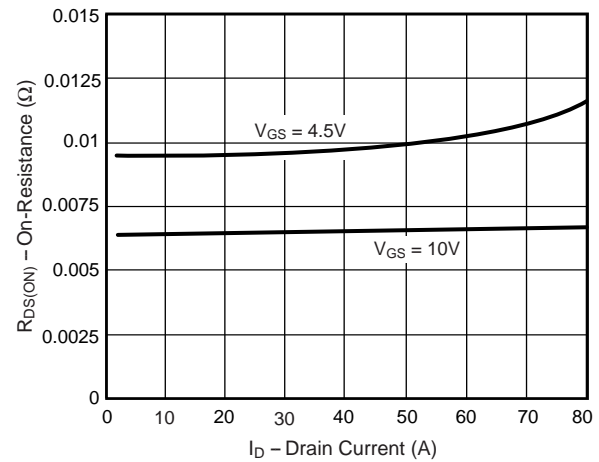
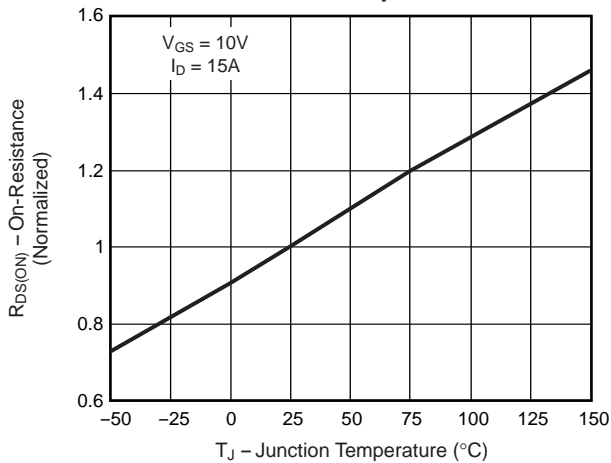
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	30	—	—	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.0	—	3.0	V
Gate-Body Leakage	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> = 30V, V <sub>GS</sub> = 0V	—	—	1.0	μA
On-State Drain Current <sup>(1)</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5V, V <sub>GS</sub> = 10V	50	—	—	A
Drain-Source On-State Resistance <sup>(1)</sup>	R <sub>DSON</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A	—	7.1	9	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 13A	—	10	12	
Forward Transconductance <sup>(1)</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15V, I <sub>D</sub> = 15A	—	50	—	S
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =5V, I <sub>D</sub> =15A	—	31	43	nC
		V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V I <sub>D</sub> = 15A	—	60	84	
			—	9	—	
Gate-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V I <sub>D</sub> = 15A	—	8.5	—	ns
Gate-Drain Charge	Q <sub>gd</sub>		—	13	26	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15V, R <sub>L</sub> = 15Ω I <sub>D</sub> ≅ 1A, V <sub>GEN</sub> = 10V R <sub>G</sub> = 6Ω	—	16	29	ns
Rise Time	t <sub>r</sub>		—	94	132	
Turn-Off Delay Time	t <sub>d(off)</sub>		—	38	57	
Fall Time	t <sub>f</sub>		—	—	—	
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V	—	3240	—	pF
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> = 15V	—	625	—	
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1.0MHz	—	285	—	
<b>Source-Drain Diode</b>						
Max Diode Forward Current	I <sub>S</sub>	—	—	—	20	A
Diode Forward Voltage <sup>(1)</sup>	V <sub>SD</sub>	I <sub>S</sub> = 20A, V <sub>GS</sub> = 0V	—	0.85	1.3	V

**Note:** (1) Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%



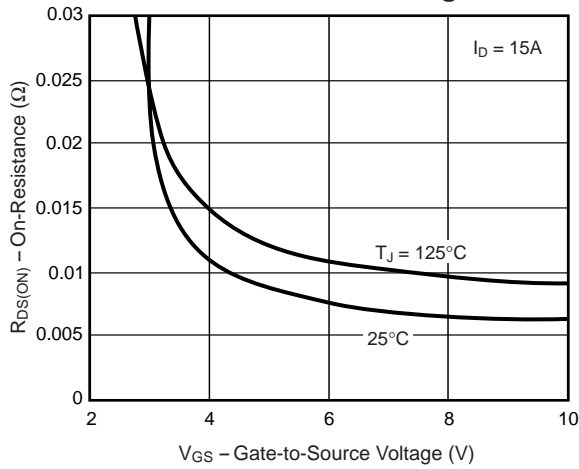
## Ratings and Characteristic Curves

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

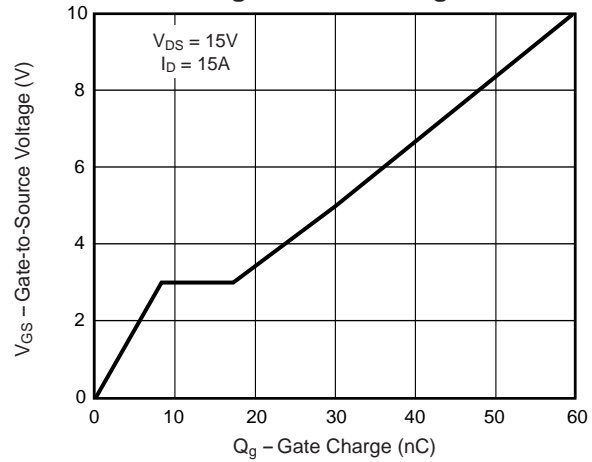
**Fig. 1 – Output Characteristics**

**Fig. 2 – Transfer Characteristics**

**Fig. 3 – Threshold Voltage**

**Fig. 4 – On-Resistance vs. Drain Current**

**Fig. 5 – On-Resistance vs. Junction Temperature**


**Ratings and Characteristic Curves** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

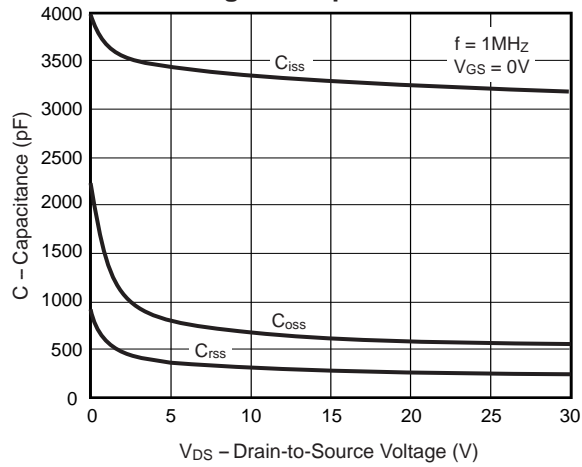
**Fig. 6 – On-Resistance vs. Gate-to-Source Voltage**



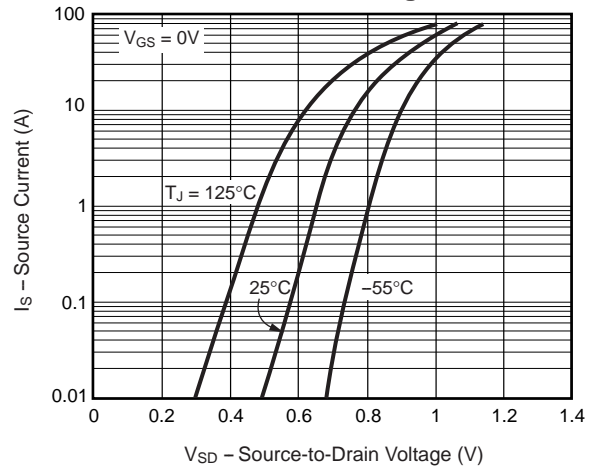
**Fig. 7 – Gate Charge**



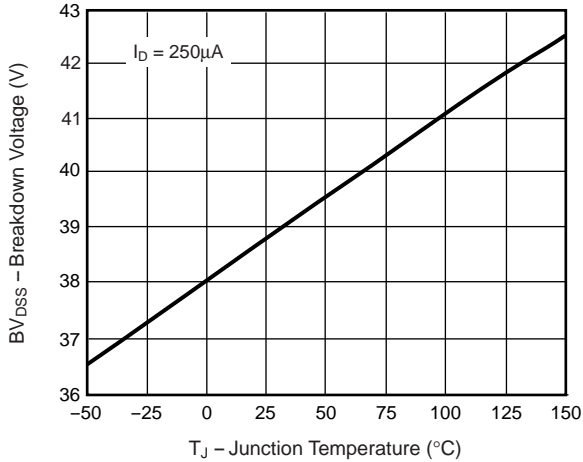
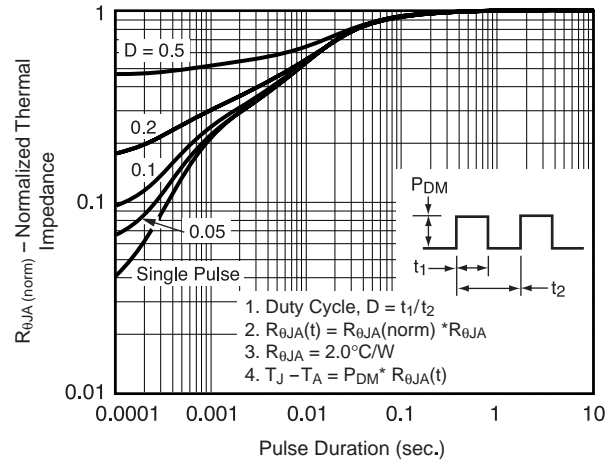
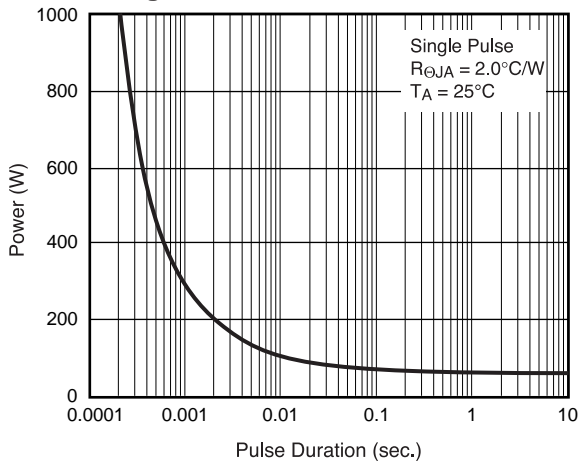
**Fig. 8 – Capacitance**



**Fig. 9 – Source-Drain Diode Forward Voltage**



## Ratings and Characteristic Curves ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

**Fig. 10 – Breakdown Voltage vs. Junction Temperature**

**Fig. 11 – Transient Thermal Impedance**

**Fig. 12 – Power vs. Pulse Duration**

**Fig. 13 – Maximum Safe Operating Area**
