

## N-Channel 200 V (D-S) MOSFET

PRODUCT SUMMARY	
$V_{DS}$ (V)	200
$R_{DS(on)}$ ( $\Omega$ )	$V_{GS} = 10\text{ V}$   0.8
$Q_g$ (Max.) (nC)	4.8
$Q_{gs}$ (nC)	0.56
$Q_{gd}$ (nC)	1.3
Configuration	Single

### FEATURES

- Low On-Resistance
- Secondary Breakdown Free
- Low Power/Voltage Driven
- Low Input and Output Leakage
- Excellent Thermal Stability



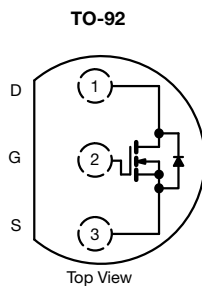
**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available

### APPLICATIONS

- High-Voltage Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Transistors, etc.
- Telephone Mute Switches, Ringer Circuits
- Power Supply, Converters
- Motor Control

### BENEFITS

- Low Offset Voltage
- Full-Voltage Operation
- Easily Driven Without Buffer
- Low Error Voltage
- No High-Temperature “Run-Away”



ABSOLUTE MAXIMUM RATINGS $T_C = 25\text{ }^\circ\text{C}$ , unless otherwise noted					
PARAMETER		SYMBOL	LIMIT	UNIT	
Drain-Source Voltage		$V_{DS}$	200	V	
Gate-Source Voltage		$V_{GS}$	$\pm 20$		
Continuous Drain Current	$V_{GS}$ at 10 V	$I_D$	$T_C = 25\text{ }^\circ\text{C}$	0.6	A
			$T_C = 70\text{ }^\circ\text{C}$	0.4	
Pulsed Drain Current <sup>a</sup>		$I_{DM}$	2.4	W/ $^\circ\text{C}$	
Linear Derating Factor			0.33		
Linear Derating Factor (PCB Mount)			0.020		
Single Pulse Avalanche Energy		$E_{AS}$	54	mJ	
Repetitive Avalanche Current		$I_{AR}$	1.0	A	
Repetitive Avalanche Energy		$E_{AR}$	2.2	mJ	
Maximum Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	$P_D$	1.6	W	
	$T_A = 75\text{ }^\circ\text{C}$		1.2		
Peak Diode Recovery $dV/dt$		$dV/dt$	3.0	V/ns	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	- 55 to + 150	$^\circ\text{C}$	
Soldering Recommendations (Peak Temperature)	for 10 s		260 <sup>d</sup>		

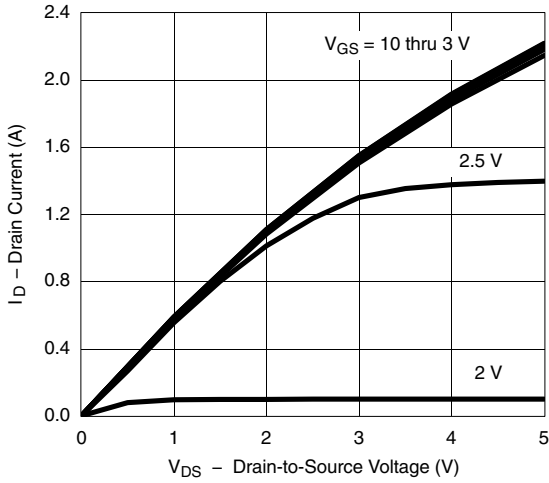
SPECIFICATIONS (T <sub>A</sub> = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Limits			
			Min.	Typ. <sup>a</sup>	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 100 μA	200			V
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	0.8	1.65	2	
Gate-Source Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 192 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 192 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C			10	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 10 V	0.8			A
		V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 4.5 V	0.5			
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.6 A		0.8		Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 0.5 A		1.0		
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 0.3 A		1.6		
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 0.6 A		1.6		S
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 0.6 A		0.8	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 192 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.5 A		4.87	8	nC
Gate-Source Charge	Q <sub>gs</sub>			0.56		
Gate-Drain Charge	Q <sub>gd</sub>			1.53		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 60 V, R <sub>L</sub> = 200 Ω I <sub>D</sub> ≅ 0.3 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 25 Ω		5	10	ns
Rise Time	t <sub>r</sub>			12	20	
Turn-Off Delay Time	t <sub>d(off)</sub>			35	60	
Fall Time	t <sub>f</sub>			16	25	

Notes:

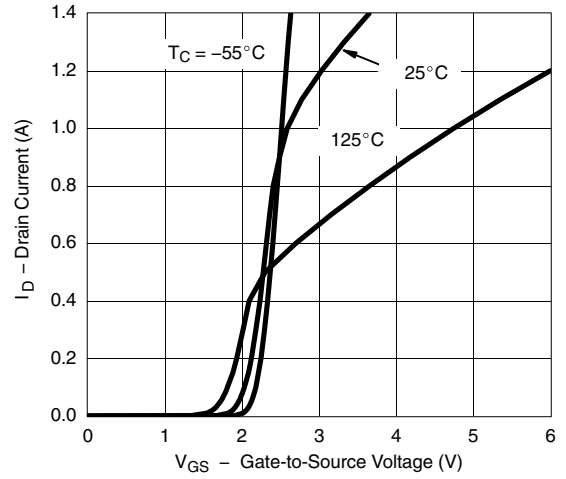
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

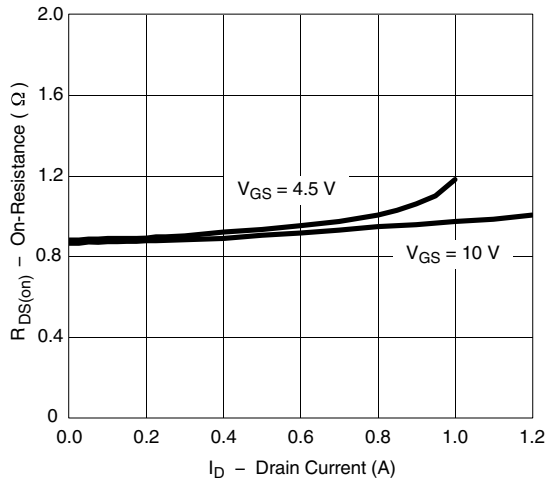
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



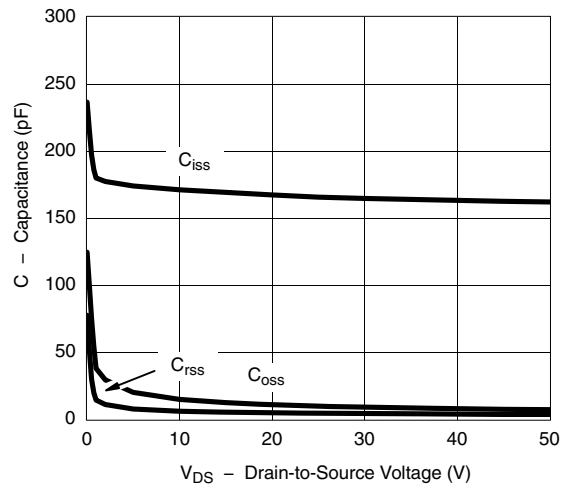
**Output Characteristics**



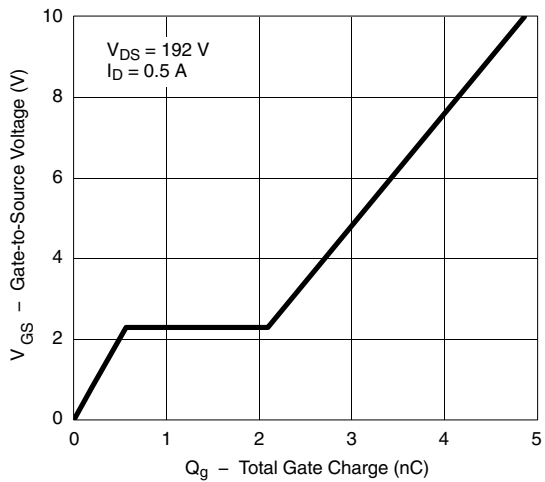
**Transfer Characteristics**



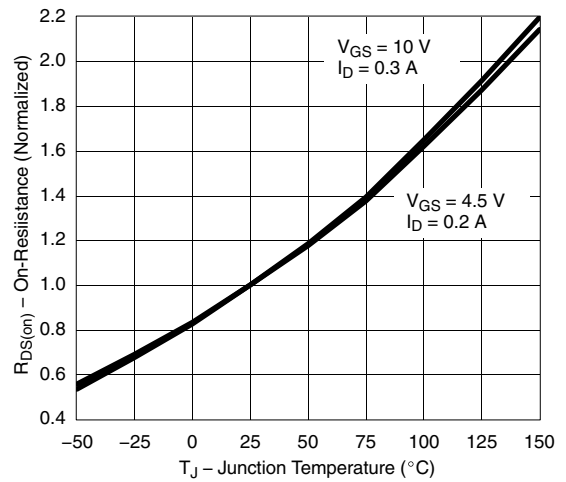
**On-Resistance vs. Drain Current**



**Capacitance**

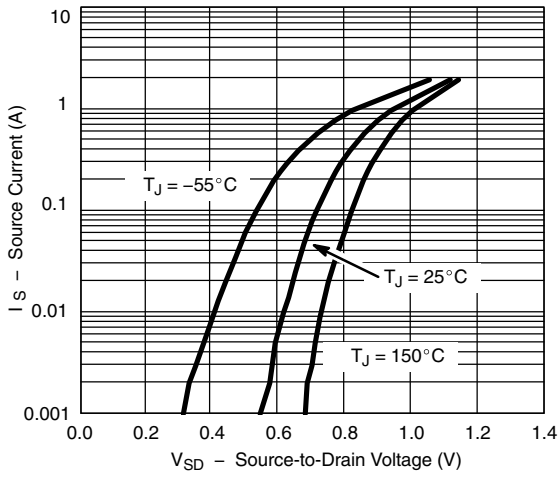


**Gate Charge**

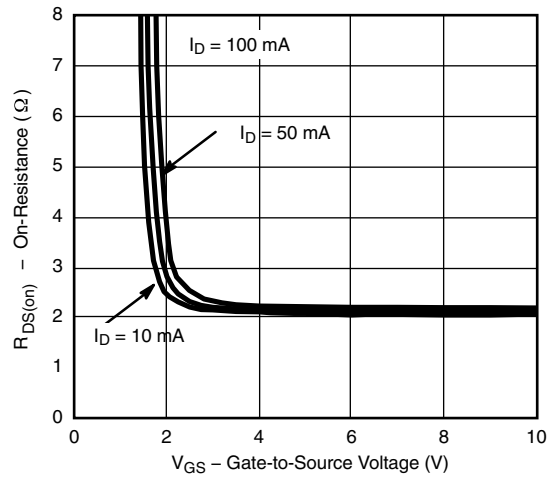


**On-Resistance vs. Junction Temperature**

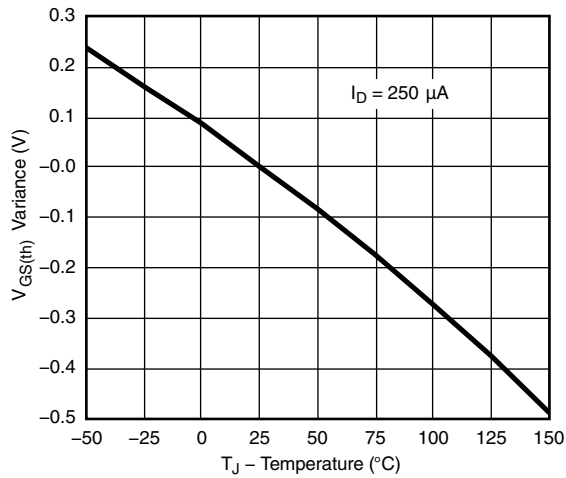
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



**Source-Drain Diode Forward Voltage**

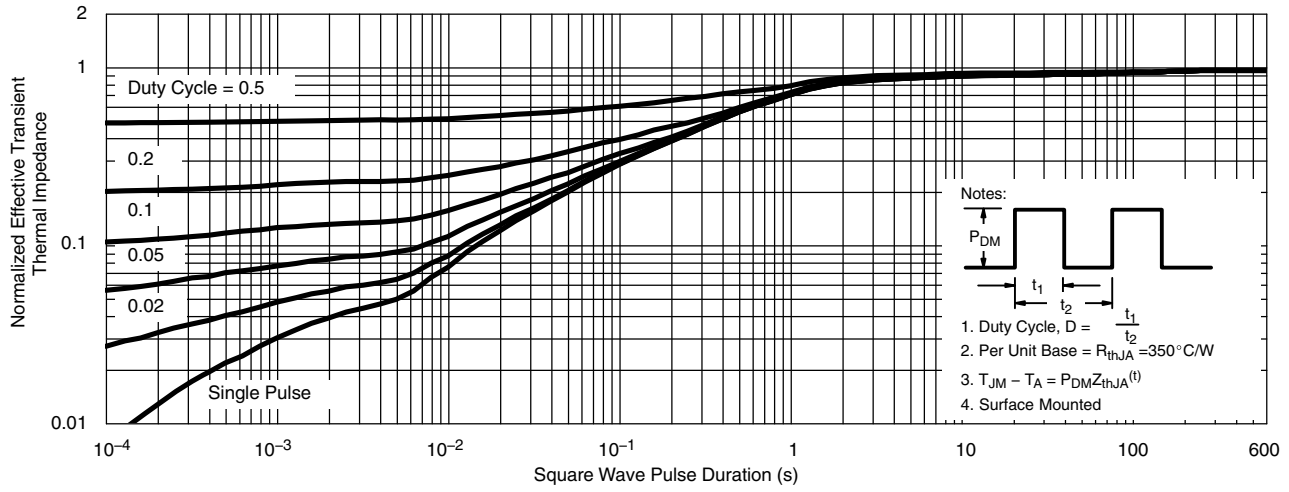


**On-Resistance vs. Gate-to-Source Voltage**

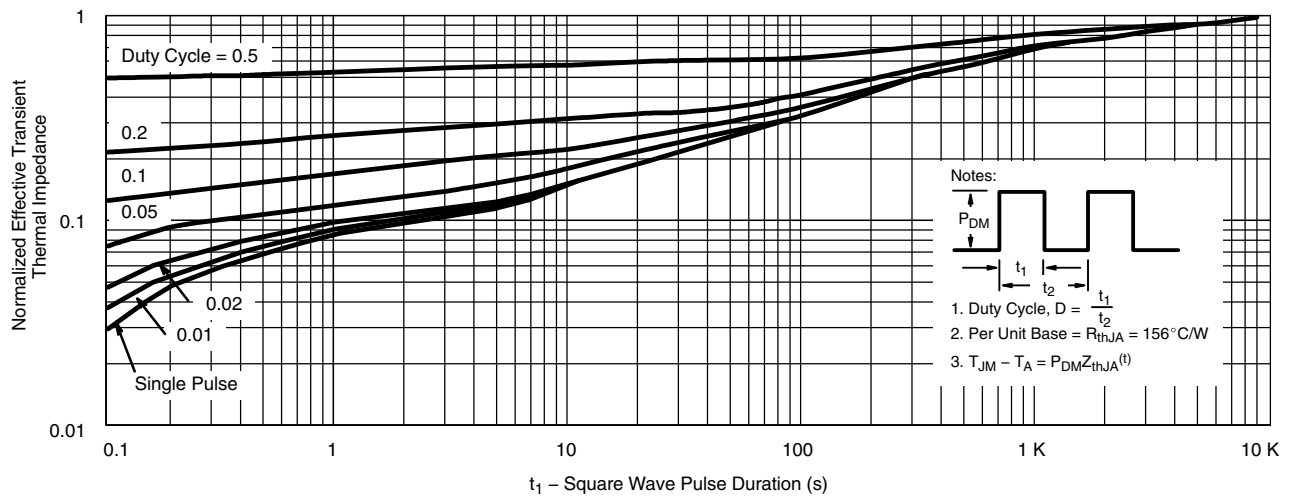


**Threshold Voltage**

**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



**Normalized Thermal Transient Impedance, Junction-to-Ambient**  
(TO-236, TN2404K only)



**Normalized Thermal Transient Impedance, Junction-to-Ambient**  
(TO-226AA, TN2404KL and TO-92-18RM, BS107KL only)

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