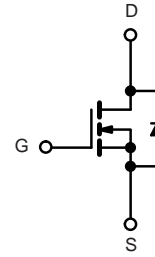


**PRODUCT SUMMARY**

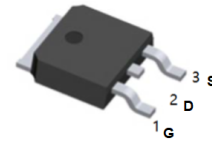
<b>V<sub>DS</sub> (V)</b>	<b>R<sub>DS(on)</sub> (Ω)</b>	<b>I<sub>D</sub> (A)</b>
100	0.114 at V <sub>GS</sub> 10 V	15



N-Channel MOSFET

**APPLICATIONS**

- Primary Side Switch



TO-252(DPAK) top view

**ABSOLUTE MAXIMUM RATINGS** (T<sub>A</sub> = 25 °C, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	100	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	
Continuous Drain Current (T <sub>J</sub> = 175 °C) <sup>b</sup>	I <sub>D</sub>	T <sub>C</sub> = 25 °C	15
		T <sub>C</sub> = 125 °C	13
Pulsed Drain Current	I <sub>DM</sub>	40	A
Continuous Source Current (Diode Conduction)	I <sub>S</sub>	3	
Avalanche Current	I <sub>AS</sub>	3	
Single Pulse Avalanche Energy	E <sub>AS</sub>	18	mJ
Maximum Power Dissipation	P <sub>D</sub>	T <sub>C</sub> = 25 °C	96 <sup>b</sup>
		T <sub>A</sub> = 25 °C	3 <sup>a</sup>
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	- 55 to 175	°C

**THERMAL RESISTANCE RATINGS**

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient <sup>a</sup>	R <sub>thJA</sub>	t ≤ 10 s	15	°C/W
		Steady State	40	
Junction-to-Case (Drain)	R <sub>thJC</sub>	0.85	1.1	

Notes:

- a. Surface mounted on 1" x 1" FR4 board.  
b. See SOA curve for voltage derating.

**N-Channel 100 V (D-S) MOSFET**

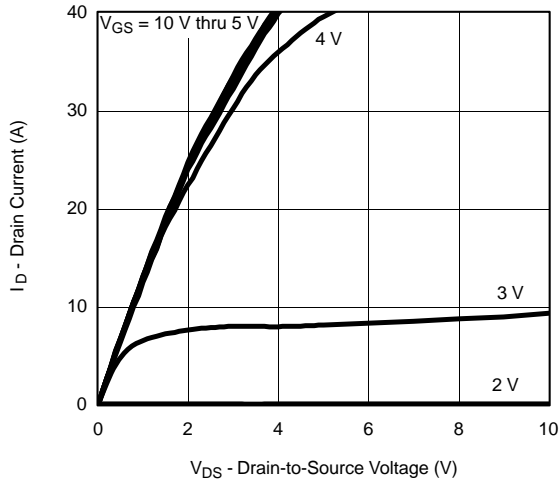
**SPECIFICATIONS** ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ. <sup>a</sup>	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1.0		2.5	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			50	
		$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			250	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	40			A
Drain-Source On-State Resistance <sup>b</sup>	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 3\text{ A}$		114		m $\Omega$
		$V_{GS} = 10\text{ V}, I_D = 3\text{ A}, T_J = 125\text{ }^\circ\text{C}$		120		
		$V_{GS} = 10\text{ V}, I_D = 3\text{ A}, T_J = 175\text{ }^\circ\text{C}$		140		
		$V_{GS} = 4.5\text{ V}, I_D = 3\text{ A}$		120		
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 3\text{ A}$		35		S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, F = 1\text{ MHz}$		950		pF
Output Capacitance	$C_{oss}$			120		
Reverse Transfer Capacitance	$C_{rss}$			60		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = 50\text{ V}, V_{GS} = 10\text{ V}, I_D = 3\text{ A}$		24	41	nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$					
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			12		
Gate Resistance	$R_g$		0.5		2.9	$\Omega$
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = 50\text{ V}, R_L = 5.2\text{ }\Omega$ $I_D = 3\text{ A}, V_{GEN} = 10\text{ V}, R_g = 2.5\text{ }\Omega$		15	25	ns
Rise Time <sup>c</sup>	$t_r$			50	75	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			30	45	
Fall Time <sup>c</sup>	$t_f$			60	90	
<b>Source-Drain Diode Ratings and Characteristics (<math>T_C = 25\text{ }^\circ\text{C}</math>)</b>						
Pulsed Current	$I_{SM}$				5	A
Diode Forward Voltage <sup>b</sup>	$V_{SD}$	$I_F = 3\text{ A}, V_{GS} = 0\text{ V}$		0.9	1.5	V
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = 3\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		180	250	ns

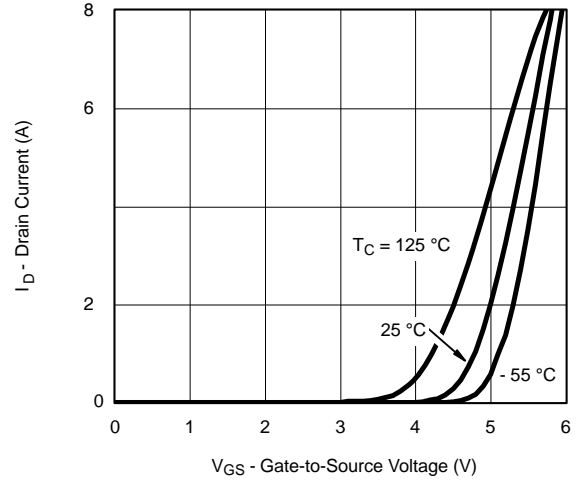
Notes:

- a. Guaranteed by design, not subject to production testing.
- b. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- c. Independent of operating temperature.

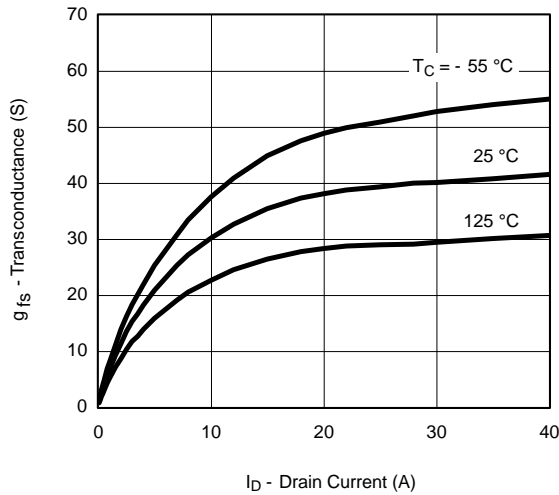
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



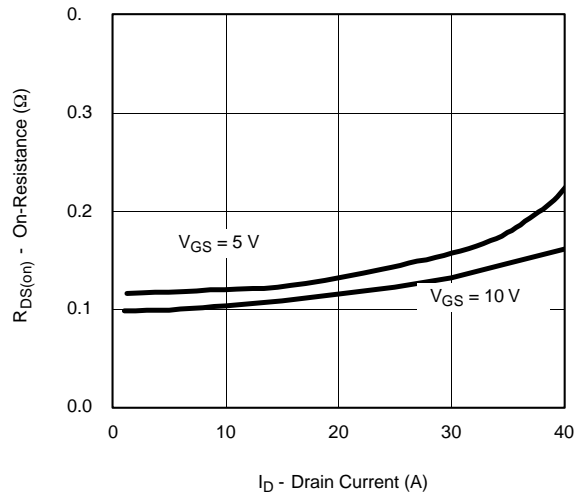
**Output Characteristics**



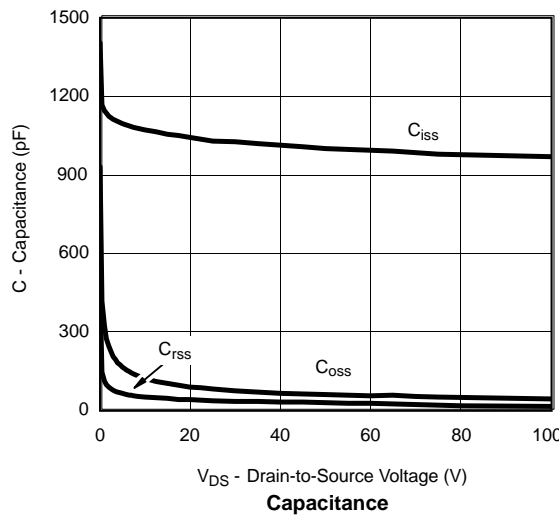
**Transfer Characteristics**



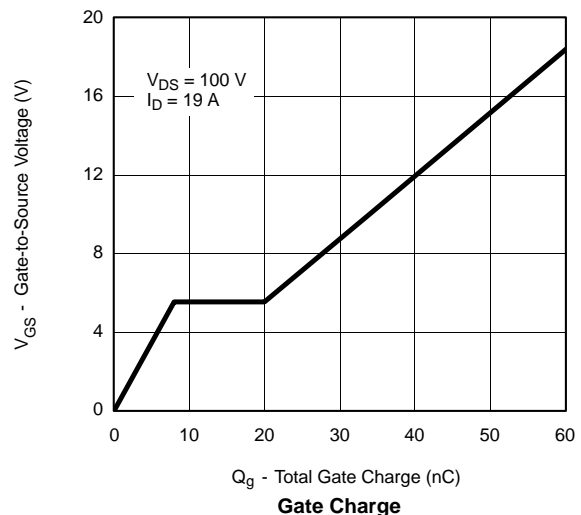
**Transconductance**



**On-Resistance vs. Drain Current**



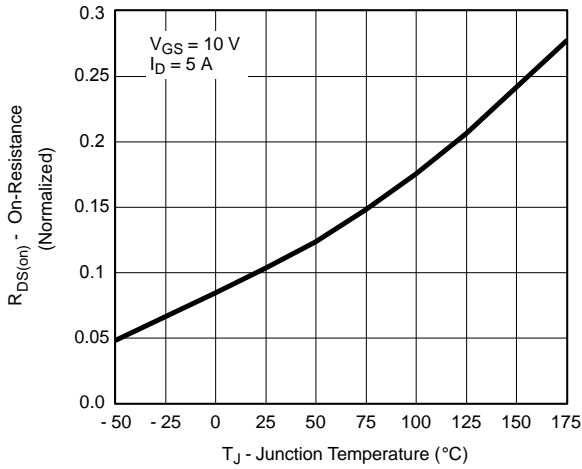
**Capacitance**



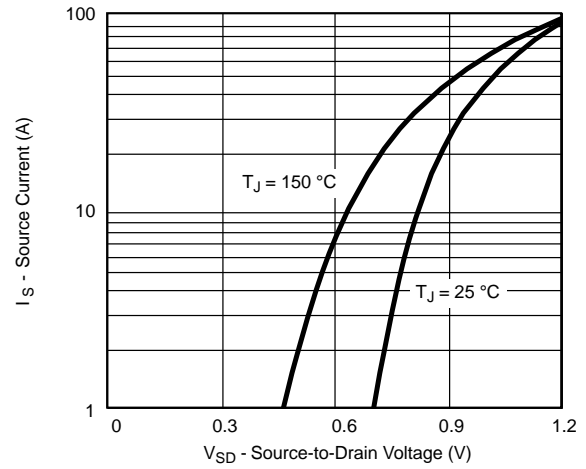
**Gate Charge**

**N-Channel 100 V (D-S) MOSFET**

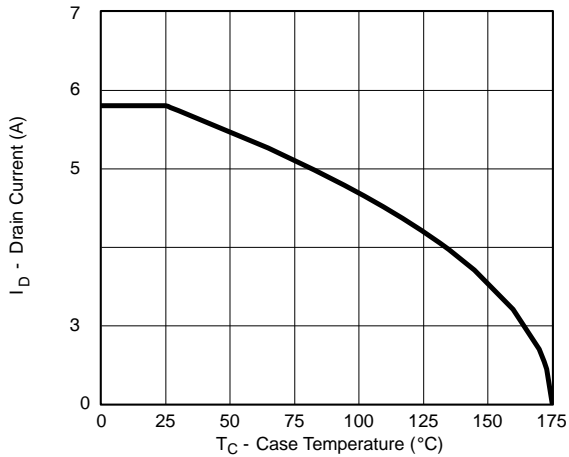
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



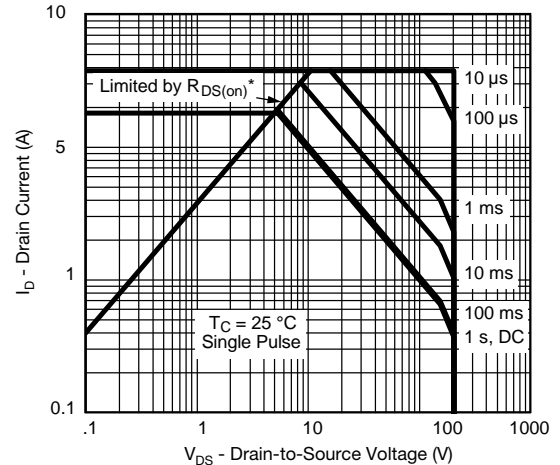
**On-Resistance vs. Junction Temperature**



**Source-Drain Diode Forward Voltage**

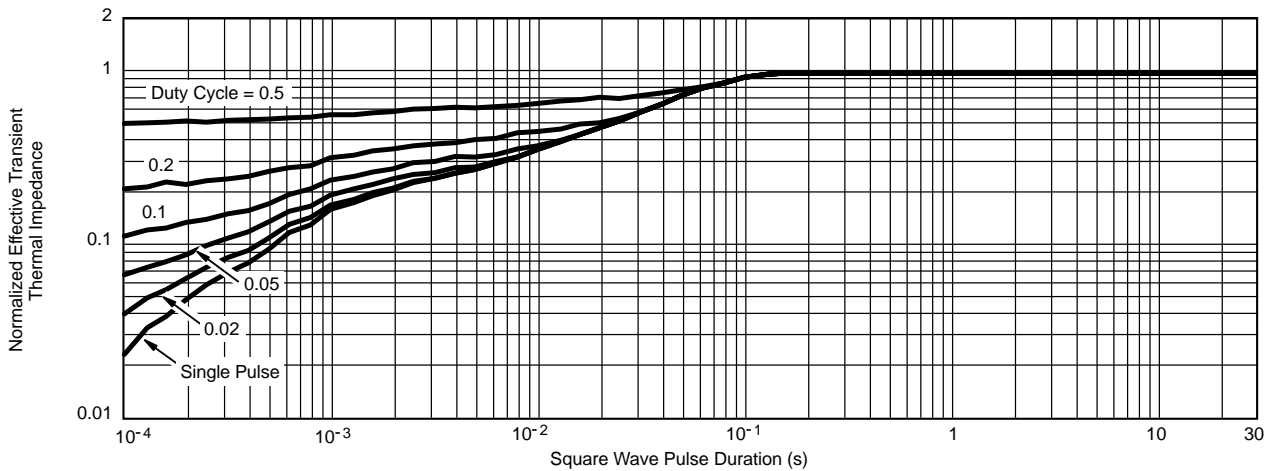


**Maximum Avalanche Drain Current vs. Case Temperature**



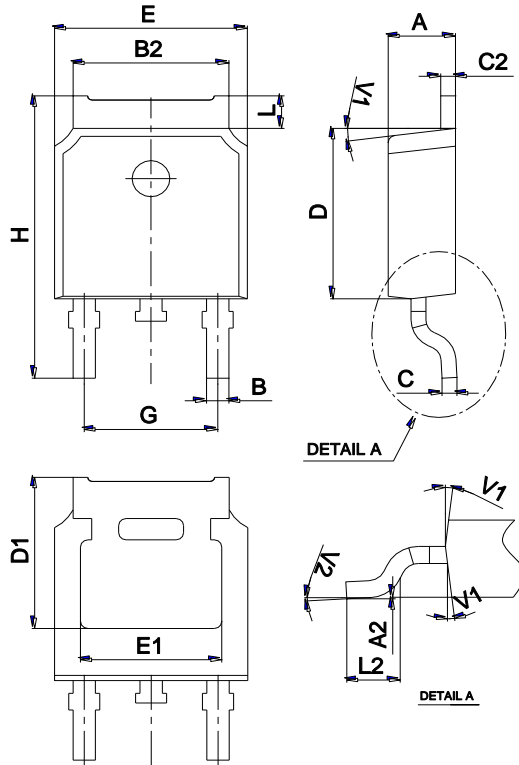
\*  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

**Safe Operating Area**



**Normalized Thermal Transient Impedance, Junction-to-Case**

**Package Mechanical Data TO-252**



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

**Ordering information**

Order code	Package	Baseqty	Delivery mode
12N10	TO-252	2500	Tape and reel