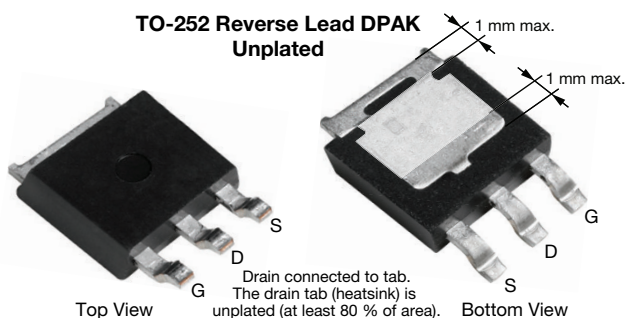


Automotive N-Channel 100 V (D-S) 175 °C MOSFET

TO-252 Reverse Lead DPAK Unplated



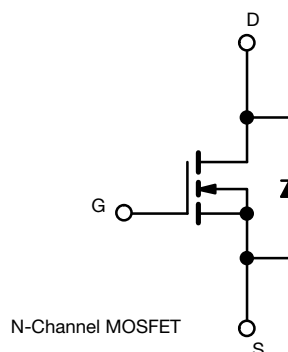
FEATURES

- TrenchFET® power MOSFET
- Unplated drain tab (heatsink)
- Package with low thermal resistance
- AEC-Q101 qualified
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE
GRADE



RoHS
COMPLIANT
HALOGEN
FREE



PRODUCT SUMMARY

V_{DS} (V)	100
$R_{DS(on)}$ (Ω) at $V_{GS} = 10$ V	0.0087
$R_{DS(on)}$ (Ω) at $V_{GS} = 4.5$ V	0.0106
I_D (A)	86
Configuration	Single
Package	TO-252 Reverse Lead DPAK

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	86	A
		50	
Continuous Source Current (Diode conduction) ^a	I_S	100	
Pulsed Drain Current ^b	I_{DM}	150	
Single Pulse Avalanche Current	I_{AS}	45	
Single Pulse Avalanche Energy	E_{AS}	101	mJ
Maximum Power Dissipation ^b	P_D	136	W
		45	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient	R_{thJA}	50	°C/W
Junction-to-Case (Drain)	R_{thJC}	1.1	

Notes

- Package limited.
- Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %.
- When mounted on 1" square PCB (FR4 material).

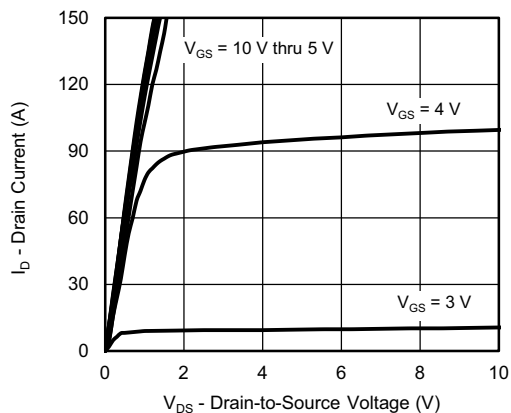
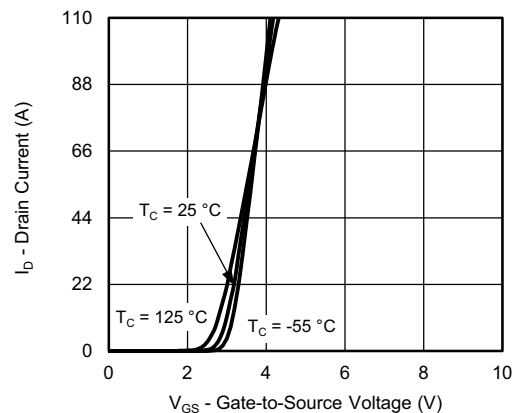
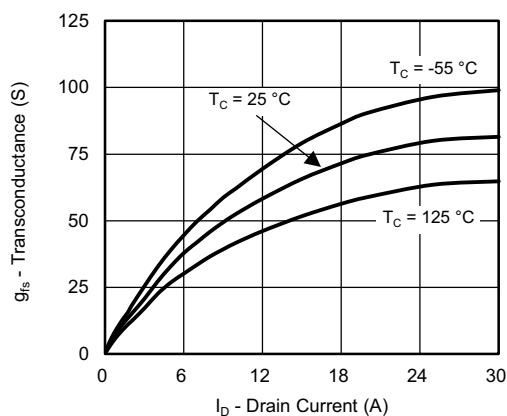
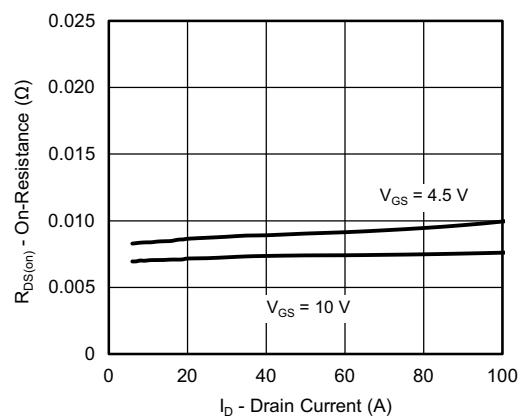
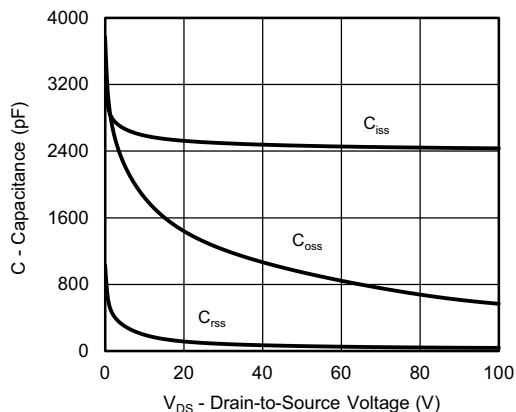
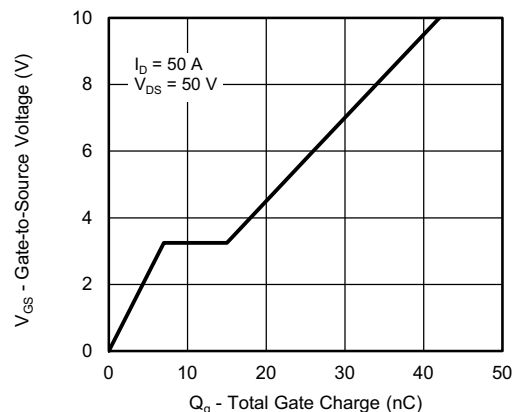


SPECIFICATIONS (T _C = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA		100	-	-	V
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA		1.5	2.0	2.5	
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V		-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0 V	V _{DS} = 100 V	-	-	1	μA
		V _{GS} = 0 V	V _{DS} = 100 V, T _J = 125 °C	-	-	50	
		V _{GS} = 0 V	V _{DS} = 100 V, T _J = 175 °C	-	-	250	
On-State Drain Current ^a	I _{D(on)}	V _{GS} = 10 V	V _{DS} ≥ 5 V	50	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V	I _D = 25 A	-	0.0072	0.0087	Ω
		V _{GS} = 4.5 V	I _D = 20 A	-	0.0087	0.0106	
		V _{GS} = 10 V	I _D = 25 A, T _J = 125 °C	-	-	0.0144	
		V _{GS} = 10 V	I _D = 25 A, T _J = 175 °C	-	-	0.0177	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 25 A		-	80	-	S
Dynamic ^b							
Input Capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = 25 V, f = 1 MHz	-	2550	3500	pF
Output Capacitance	C _{oss}			-	1350	1900	
Reverse Transfer Capacitance	C _{rss}			-	101	140	
Total Gate Charge ^c	Q _g	V _{GS} = 10 V	V _{DS} = 50 V, I _D = 50 A	-	42	65	nC
Gate-Source Charge ^c	Q _{gs}			-	7	-	
Gate-Drain Charge ^c	Q _{gd}			-	8	-	
Gate Resistance	R _g	f = 1 MHz		1.4	2.9	4.4	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 50 V, R _L = 1 Ω I _D ≅ 50 A, V _{GEN} = 10 V, R _g = 1 Ω		-	12	20	ns
Rise Time ^c	t _r			-	5	10	
Turn-Off Delay Time ^c	t _{d(off)}			-	35	60	
Fall Time ^c	t _f			-	6	15	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed Current ^a	I _{SM}			-	-	150	A
Forward Voltage	V _{SD}	I _F = 25 A, V _{GS} = 0 V		-	0.88	1.5	V

Notes

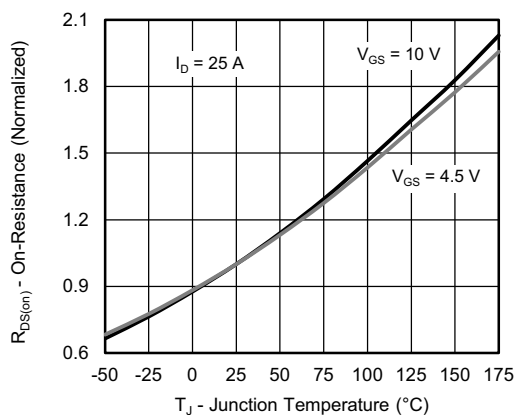
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

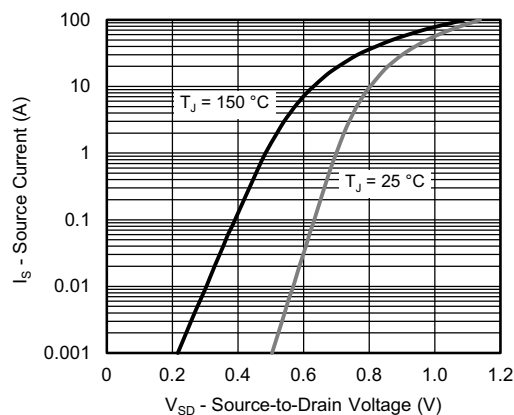
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Output Characteristics

Transfer Characteristics

Transconductance

On-Resistance vs. Drain Current

Capacitance

Gate Charge



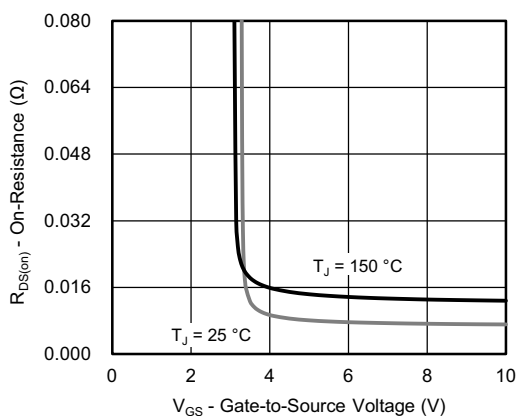
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



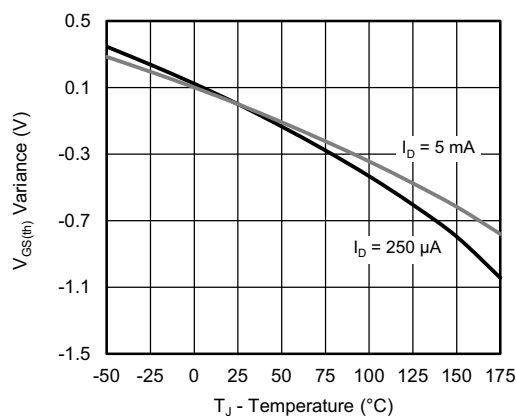
On-Resistance vs. Junction Temperature



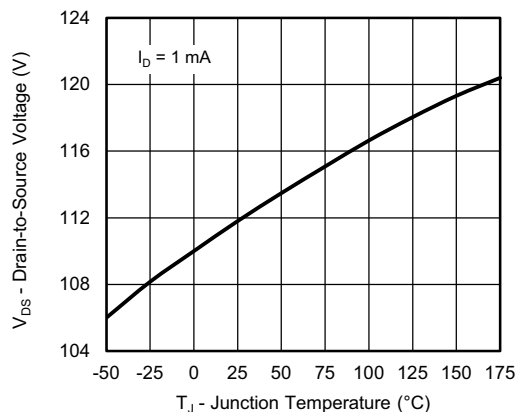
Source Drain Diode Forward Voltage



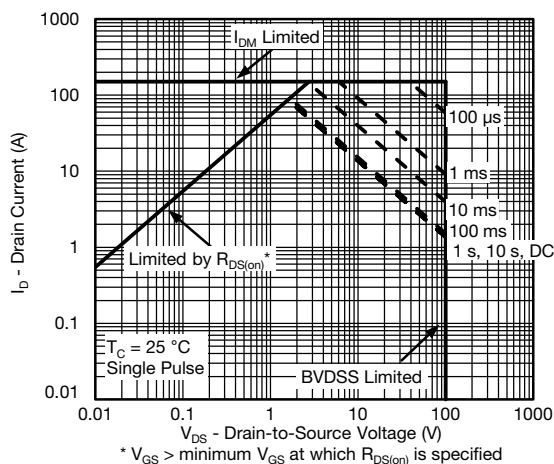
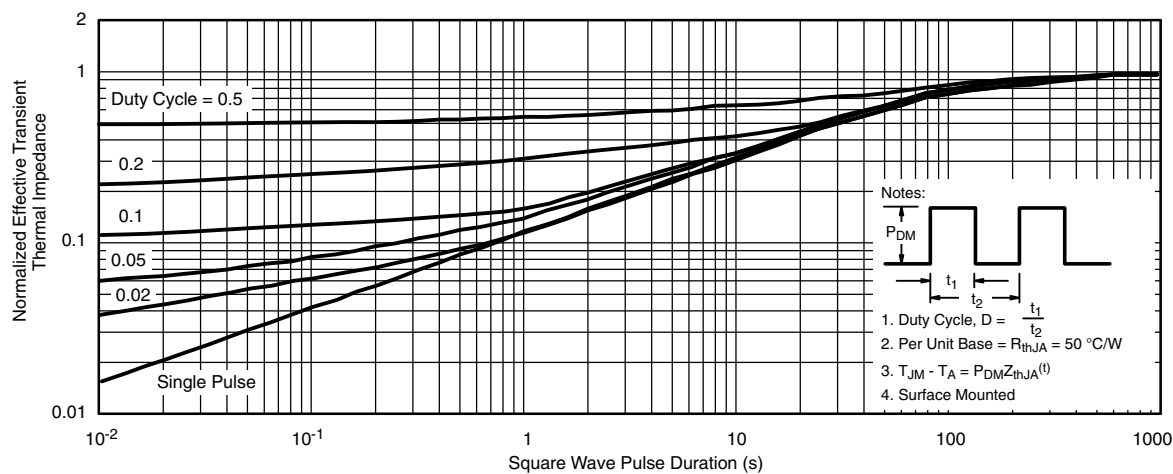
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

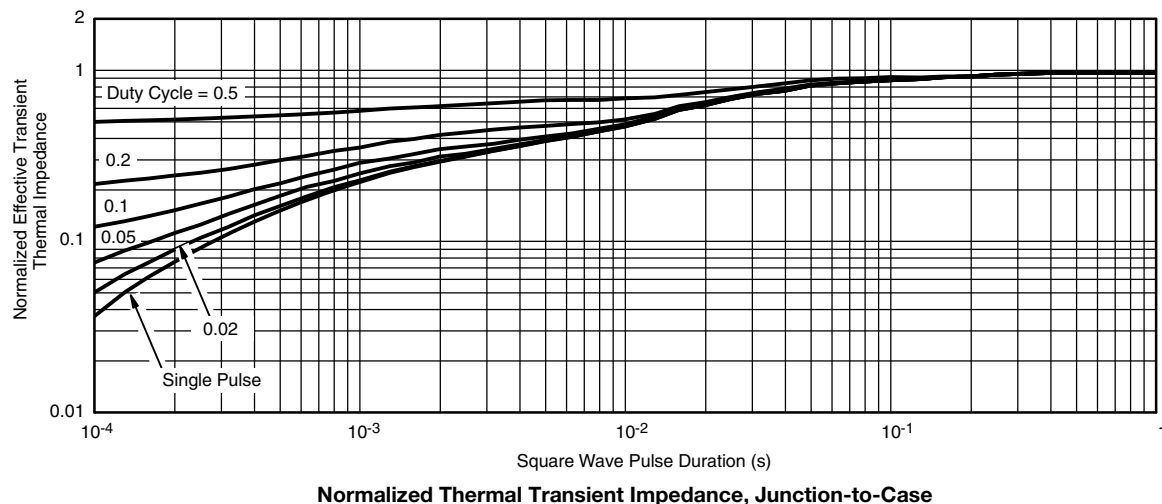


Drain Source Breakdown vs. Junction Temperature

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

Safe Operating Area

Normalized Thermal Transient Impedance, Junction-to-Ambient



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



Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient ($25\text{ }^{\circ}\text{C}$)
 - Normalized Transient Thermal Impedance Junction-to-Case ($25\text{ }^{\circ}\text{C}$)are given for general guidelines only to enable the user to get a “ball park” indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

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