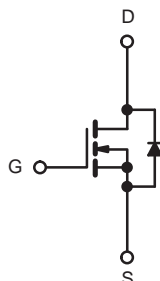
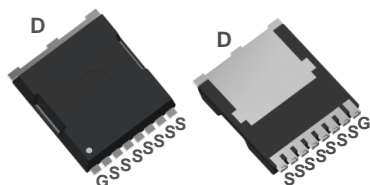


N-Channel 40 V (D-S) MOSFET

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ) TYP.	I _D (A)	Q _g (TYP.)
40	0.8 at V _{GS} = 10 V	320	245 nC

TOLL Pin Configuration



N-Channel MOSFET

FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS tested

APPLICATIONS

- Power supplies:
 - Uninterruptible power supplies
 - AC/DC switch-mode power supplies
 - Lighting
- Synchronous rectification
- DC/DC converter
- Motor drive switch
- DC/AC inverter
- Battery management



RoHS
COMPLIANT
HALOGEN
FREE

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

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V _{DS}	40	V
Gate-Source Voltage		V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	T _C = 25 °C	I _D	320	A
	T _C = 100 °C		225	
Pulsed Drain Current (t = 100 μs)		I _{DM}	1280	
Avalanche Current ^d		I _{AS}	115	
Single Avalanche Energy ^a		E _{AS}	1230	mJ
Maximum Power Dissipation ^a	T _C = 25 °C	P _D	303 ^b	W
	T _C = 100 °C		151 ^b	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS

PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^c	t ≤ 10 s	R _{thJA}	15	°C/W
Junction-to-Case (Drain)	Steady State	R _{thJC}	0.5	

Notes

- Duty cycle ≤ 1 %.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR4 material).
- Single pulse width limited by junction temperature T_J(MAX)=150°C.

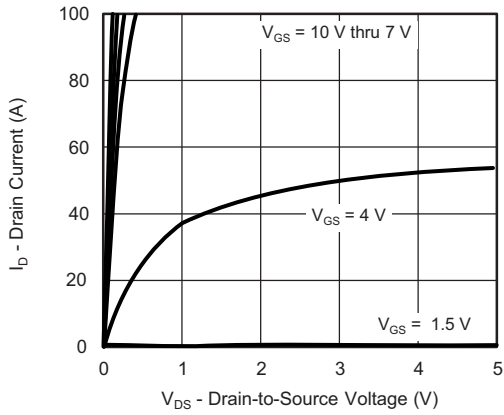
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	40	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.5	-	3.5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 32 V, V _{GS} = 0 V, T _J = 85 °C	-	-	10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 10 V, V _{GS} = 10 V	320	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 30 A	-	0.8	0.98	mΩ
		V _{GS} = 4.5 V, I _D = 30 A	-	1.5	2.2	
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 30 A	-	108	-	S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 20 V, f = 1 MHz	-	7870	-	pF
Output Capacitance	C _{oss}		-	1380	-	
Reverse Transfer Capacitance	C _{rss}		-	855	-	
Total Gate Charge ^c	Q _g	V _{DS} = 20 V, V _{GS} = 10 V, I _D = 30 A	-	245	-	nC
Gate-Source Charge ^c	Q _{gs}		-	48	-	
Gate-Drain Charge ^c	Q _{gd}		-	52	-	
Gate Resistance	R _g	f = 1 MHz	-	2.8	-	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 20 V, I _D =30 A, R _g = 3 Ω V _{GEN} = 10 V	-	38	-	ns
Rise Time ^c	t _r		-	45	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	152	-	
Fall Time ^c	t _f		-	62	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T _C = 25 °C)						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	-	-	320	A
Pulsed Current (t = 100 μs)	I _{SM}		-	-	1280	A
Forward Voltage ^a	V _{SD}	I _F = 1 A, V _{GS} = 0 V	-	-	1	V
Reverse Recovery Time	t _{rr}	I _F = 30 A, di/dt = 500 A/μs	-	49	-	ns
Reverse Recovery Charge	Q _{rr}		-	175	-	nC

Notes

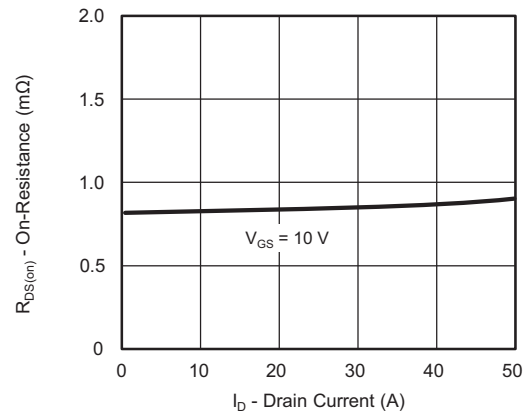
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.
 c. Independent of operating temperature.

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.

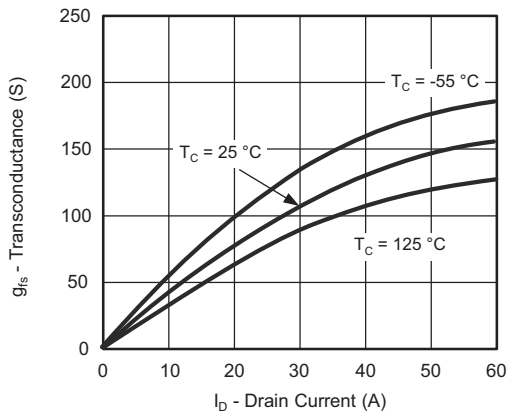
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)



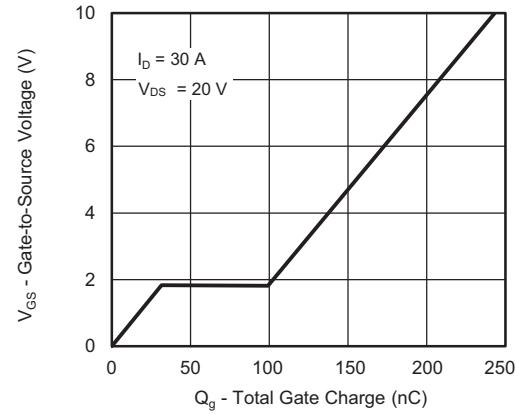
Output Characteristics



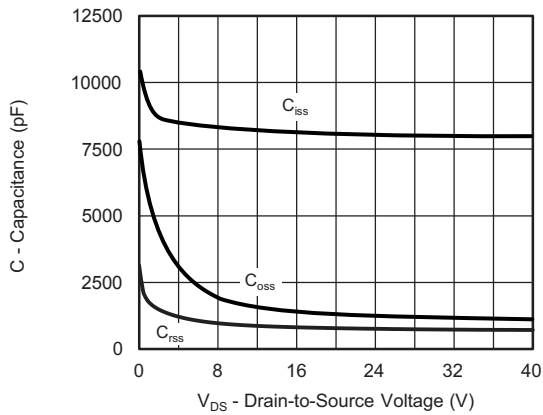
On-Resistance vs. Drain Current



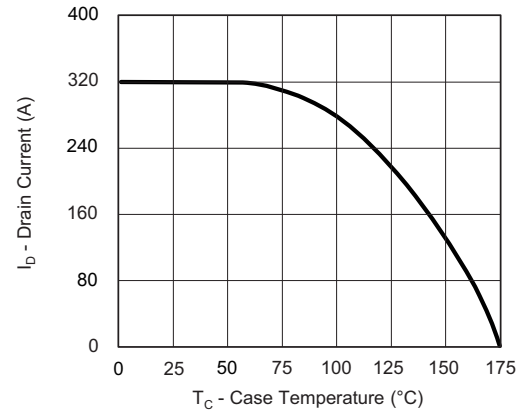
Transconductance



Gate Charge

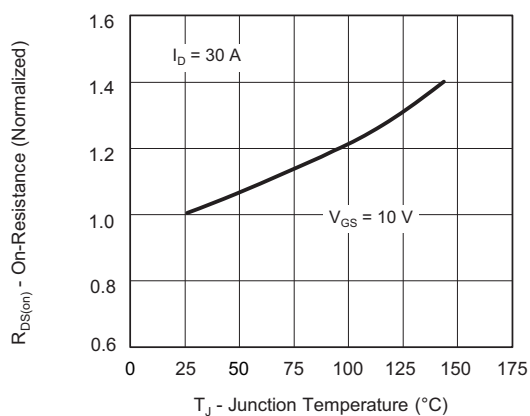


Capacitance

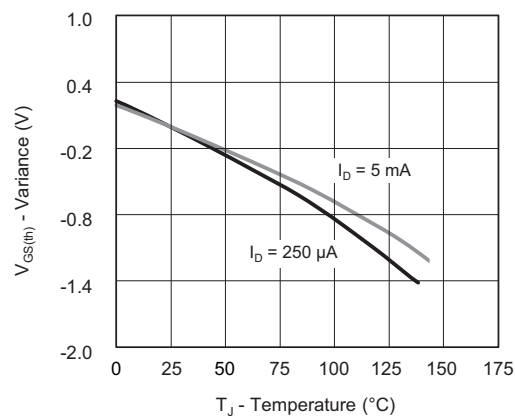


Current De-Rating

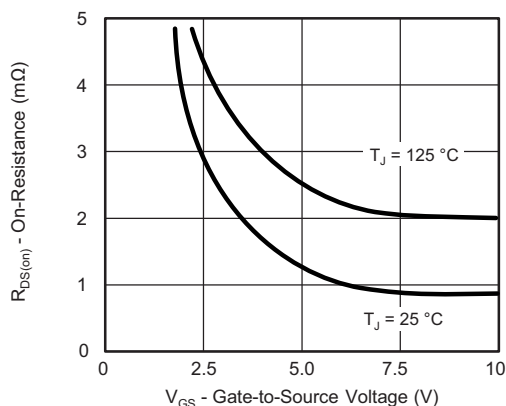
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)



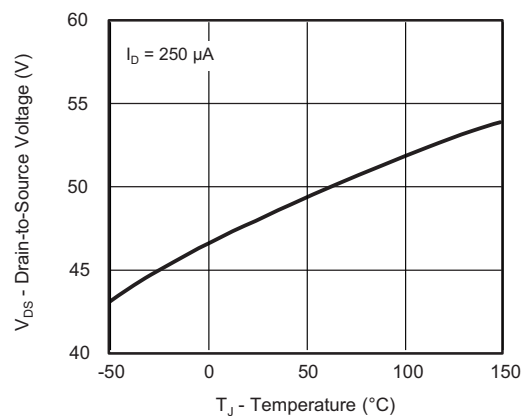
On-Resistance vs. Junction Temperature



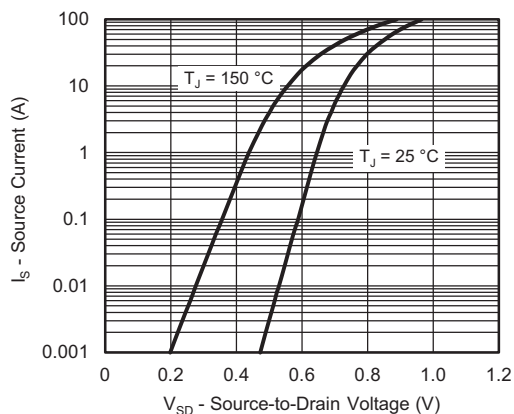
Threshold Voltage



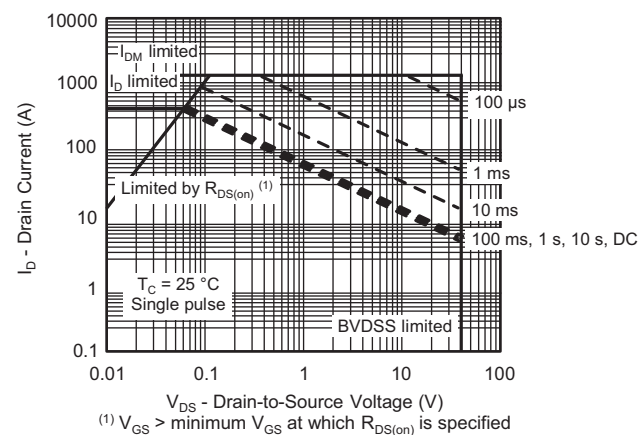
On-Resistance vs. Gate-to-Source Voltage



Drain Source Breakdown vs. Junction Temperature

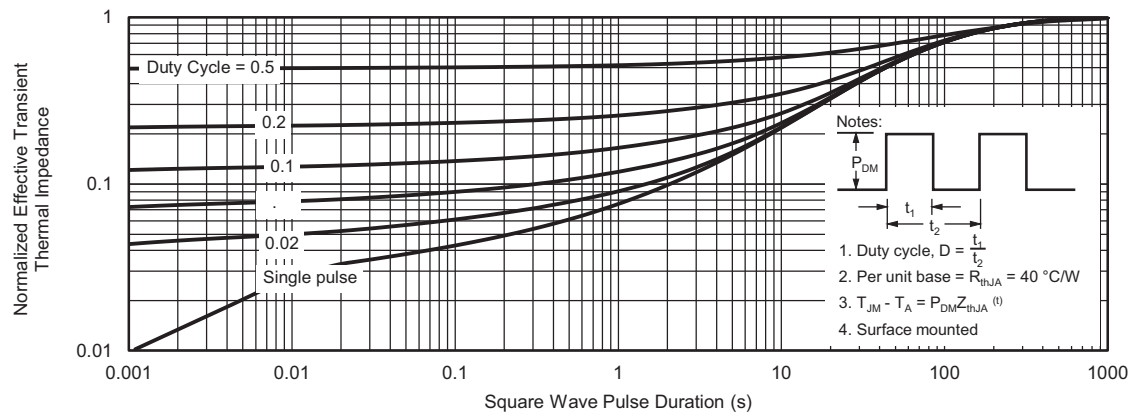


Source Drain Diode Forward Voltage



Safe Operating Area

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



Normalized Thermal Transient Impedance, Junction-to-Ambient

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