

N-Channel 80 V (D-S) Super Junction Power MOSFET

PRODUCT SUMMARY

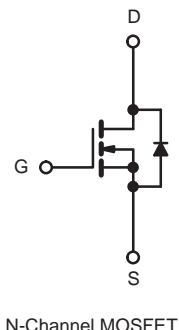
V _{DS} (V)	R _{DS(on)} (Ω) MAX.	I _D (A)	Q _g (TYP.)
80	0.0021 at V _{GS} = 10 V	200	168 nC
	0.0027 at V _{GS} = 4.5 V	180	

FEATURES

- Maximum 175 °C junction temperature
- 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


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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	80	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C 200	A
		T _C = 125 °C 140	
Pulsed Drain Current (t = 100 μs)	I _{DM}	800	
Avalanche Current	I _{AS}	190	
Single Avalanche Energy ^a	E _{AS}	1925	mJ
Maximum Power Dissipation ^a	P _D	T _C = 25 °C 300 ^b	W
		T _C = 125 °C 125 ^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	R _{thJA}	2.1	°C/W
Junction-to-Case (Drain)	R _{thJC}	0.5	

Notes

- Duty cycle ≤ 1 %.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR4 material).

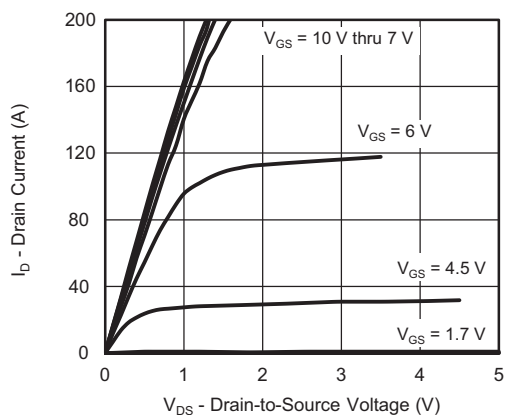
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	80	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1	-	3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 80 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 80 V, V _{GS} = 0 V, T _J = 125 °C	-	-	100	
		V _{DS} = 80 V, V _{GS} = 0 V, T _J = 175 °C	-	-	2	mA
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 10 V, V _{GS} = 10 V	200	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 30 A	-	0.0021	0.0027	Ω
		V _{GS} = 4.5 V, I _D = 30 A	-	0.0028	0.0036	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	-	90	-	S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 50 V, f = 1 MHz	-	10500	-	pF
Output Capacitance	C _{oss}		-	1650	-	
Reverse Transfer Capacitance	C _{rss}		-	75	-	
Total Gate Charge ^c	Q _g	V _{DS} = 50 V, V _{GS} = 10 V, I _D = 30 A	-	168	-	nC
Gate-Source Charge ^c	Q _{gs}		-	55	-	
Gate-Drain Charge ^c	Q _{gd}		-	23	-	
Gate Resistance	R _g	f = 1 MHz	-	2.3	-	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 50 V, R _L = 1.67 Ω I _D ≅ 30 A, V _{GEN} = 10 V, R _g = 1 Ω	-	28	-	ns
Rise Time ^c	t _r		-	75	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	88	-	
Fall Time ^c	t _f		-	32	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T _C = 25 °C)						
Pulsed Current (t = 100 μs)	I _{SM}		-	-	800	A
Forward Voltage ^a	V _{SD}	I _F = 30 A, V _{GS} = 0 V	-	0.7	1.2	V
Reverse Recovery Time	t _{rr}	I _F = 30 A, di/dt = 100 A/μs	-	118	-	ns
Peak Reverse Recovery Charge	I _{RM(REC)}		-	5	10	A
Reverse Recovery Charge	Q _{rr}		-	305	-	μC

Notes

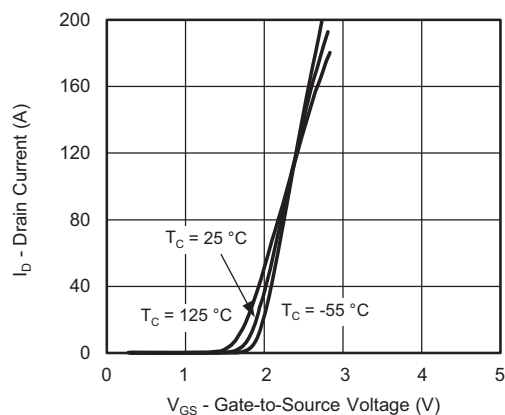
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

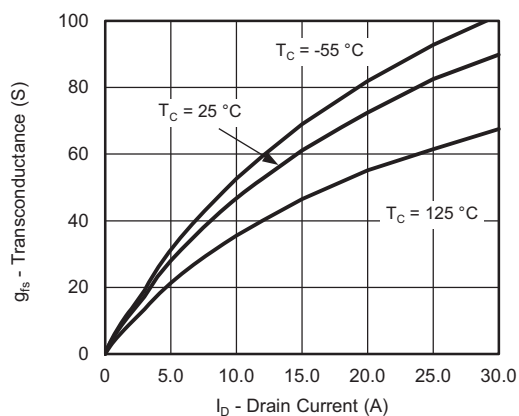
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



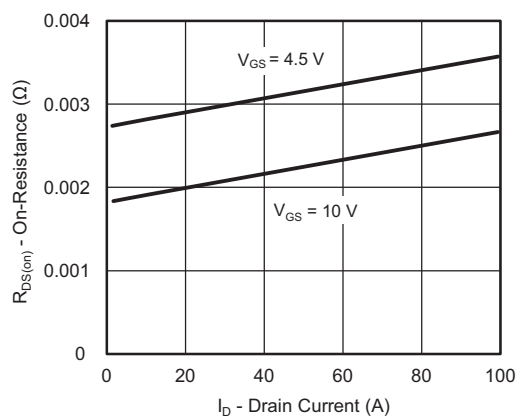
Output Characteristics



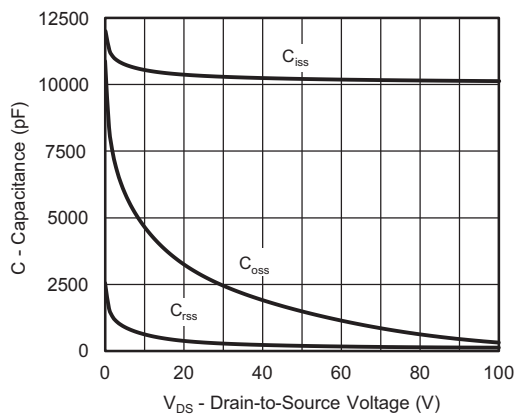
Transfer Characteristics



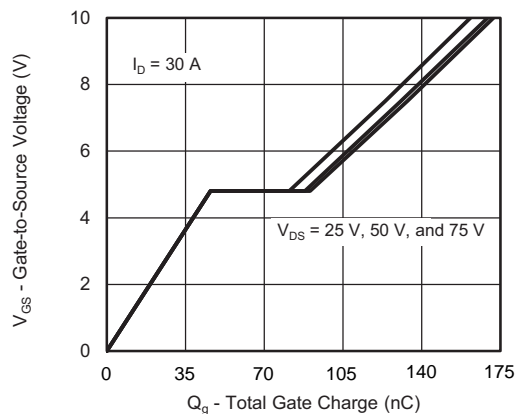
Transconductance



On-Resistance vs. Drain Current

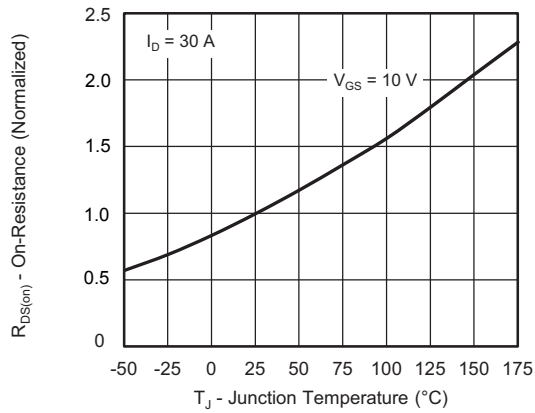


Capacitance

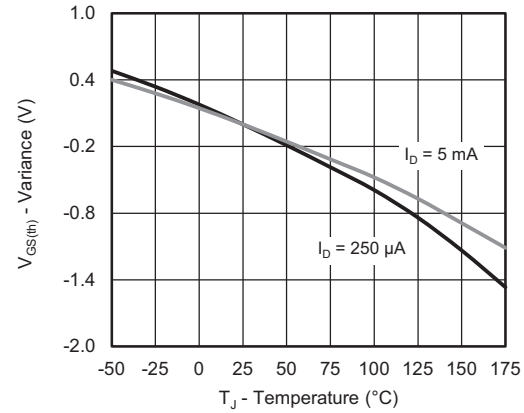


Gate Charge

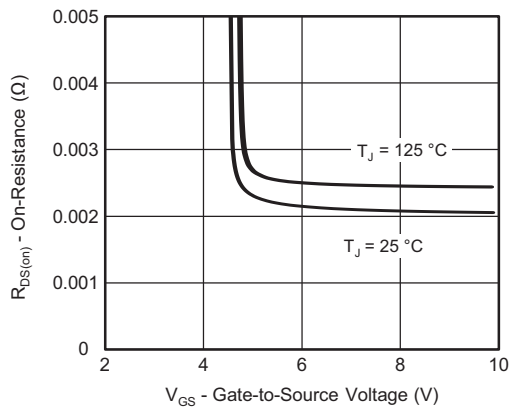
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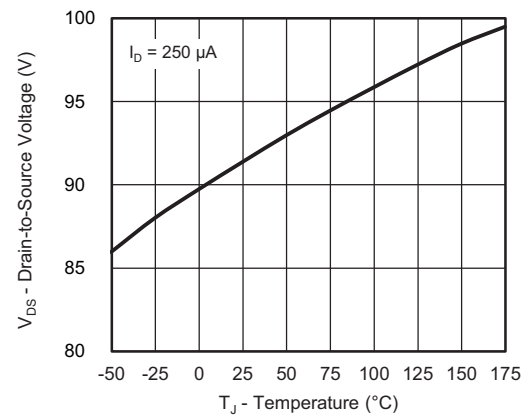
On-Resistance vs. Junction Temperature



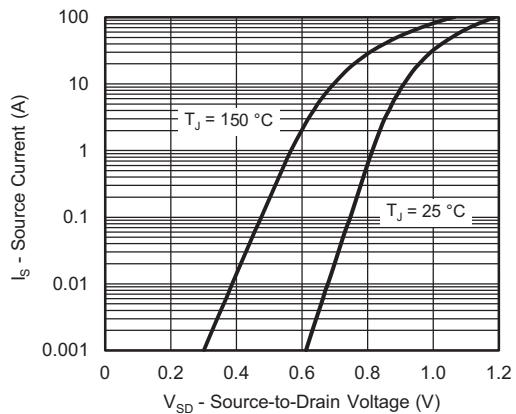
Threshold Voltage



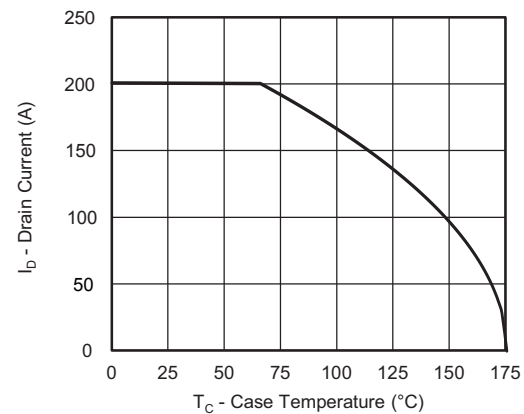
On-Resistance vs. Gate-to-Source Voltage



Drain Source Breakdown vs. Junction Temperature

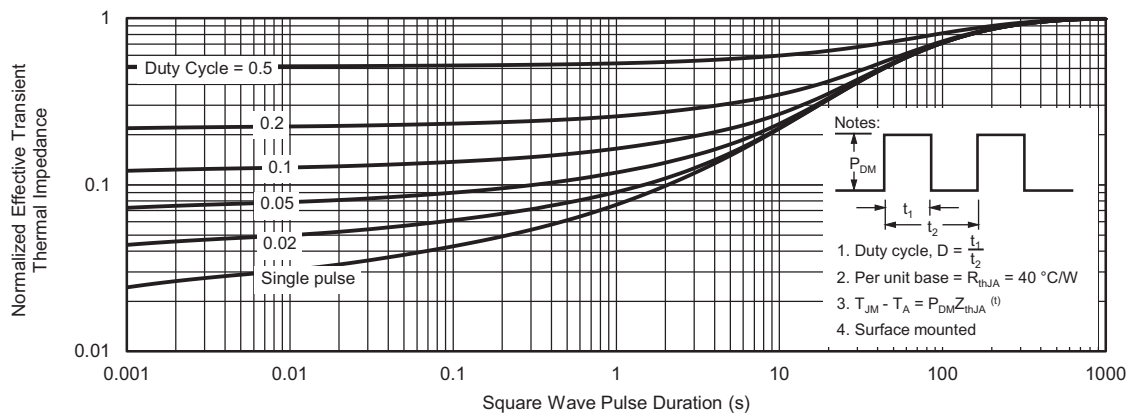
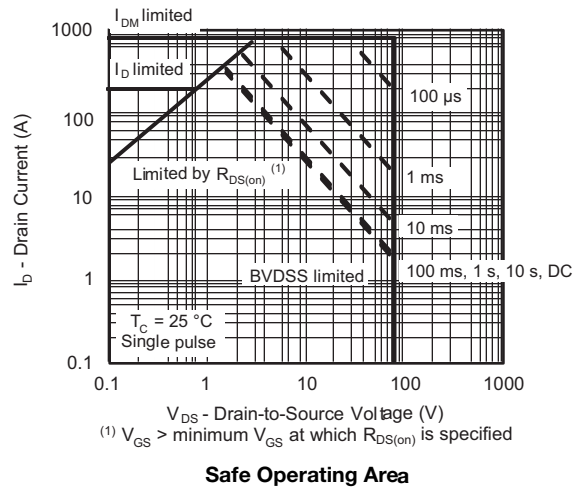


Source Drain Diode Forward Voltage



Current De-Rating

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



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