

N-Channel 800 V (D-S) Super Junction Power MOSFET



RoHS
COMPLIANT

PRODUCT SUMMARY			
V _{DS} (V)@T _J (max)	R _{DS(on)} (mΩ)(Typ.)	I _D (A)	Q _g (Typ.)
850	150 at V _{GS} = 10 V	18	54.7 nC

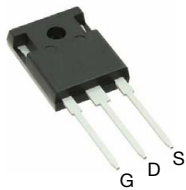
FEATURES

- DT-SJ Power MOSFET
- 100 % Rg and UIS tested
- Low R_{DS(ON)}×FOM
- Extremely low switching loss
- Excellent stability and uniformity

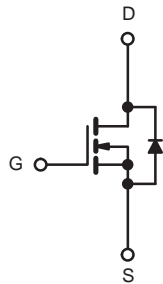
APPLICATIONS

- PC power
- Telecom power
- Server power
- LED Light
- EV Charger

TO-247 Pin Configuration



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	800	V
Gate-Source Voltage	V _{GS}	± 30	
Continuous Drain Current (T _J = 150 °C) ^a	I _D	T _C = 25 °C	A
		T _C = 100 °C	
Pulsed Drain Current ^b	I _{DM}	54	
Single Avalanche Energy ^e	E _{AS}	662	mJ
Maximum Power Dissipation ^c	P _D	T _C = 25 °C	W
		T _C = 100 °C	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to +150	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^d	R _{thJA}	62	°C/W
Junction-to-Case (Drain)	R _{thJC}	0.57	

Notes

- Calculated continuous current based on maximum allowable junction temperature.
- Repetitive rating; pulse width limited by max. junction temperature.
- P_d is based on max. junction temperature, using junction-case thermal resistance.
- The value of R_{thJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 °C.
- V_{DS}=100 V, V_{GS}=10 V, L=75mH, starting T_J=25 °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	800	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.9	-	4	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 30 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 800 V, V _{GS} = 0 V	-	-	10	μA
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 9 A	-	150	190	mΩ
		V _{GS} = 10 V, I _D = 9 A, T _J = 150 °C	-	434	-	
Forward Transconductance ^a	g _{fs}	V _{DS} = 50 V, I _D = 9 A	-	15	-	S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 50 V, f = 100 KHz	-	2718	-	pF
Output Capacitance	C _{oss}		-	120	-	
Reverse Transfer Capacitance	C _{rss}		-	5.2	-	
Total Gate Charge ^c	Q _g	V _{DS} = 400 V, V _{GS} = 10 V, I _D = 10 A	-	54.7	-	nC
Gate-Source Charge ^c	Q _{gs}		-	14	-	
Gate-Drain Charge ^c	Q _{gd}		-	5.5	-	
Gate Resistance	R _g	f = 1 MHz	-	1.6	-	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 400 V, I _D = 10 A, V _{GEN} = 10 V, R _g = 2 Ω	-	47	-	ns
Rise Time ^c	t _r		-	26	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	147	-	
Fall Time ^c	t _f		-	18	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T_C = 25 °C)						
Continuous Source Current	I _S	T _C = 25 °C	-	-	18	A
Pulsed Current (t = 100 μs)	I _{SM}		-	-	54	A
Forward Voltage ^a	V _{SD}	I _S = 18 A, V _{GS} = 0 V	-	-	1.3	V
Reverse Recovery Time	t _{rr}	I _S = 10 A, di/dt = 100 A/μs	-	374	-	ns
Reverse Recovery Charge	Q _{rr}		-	5.9	-	μC
Peak reverse recovery current	I _{rrm}		-	28.6	-	A

Notes

- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 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)

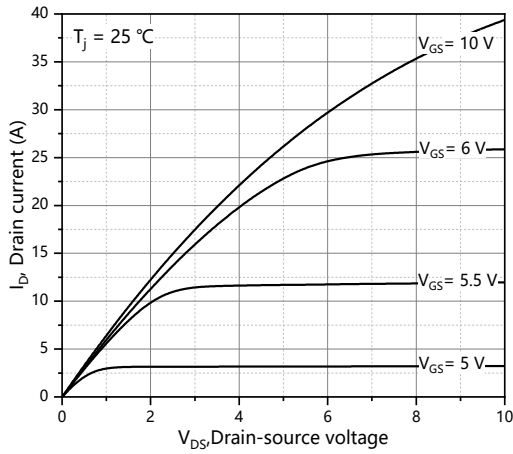


Figure 1. Typ. output characteristics

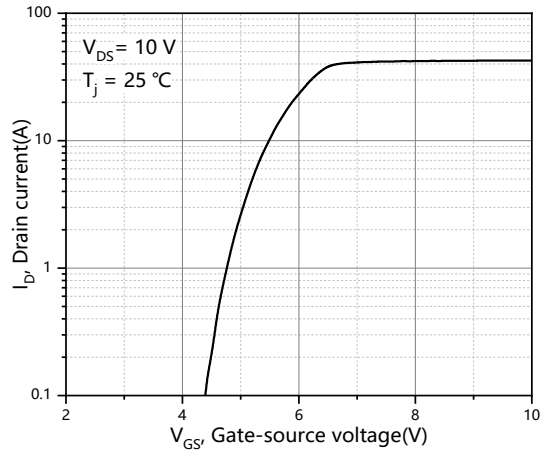


Figure 2. Typ. transfer characteristics

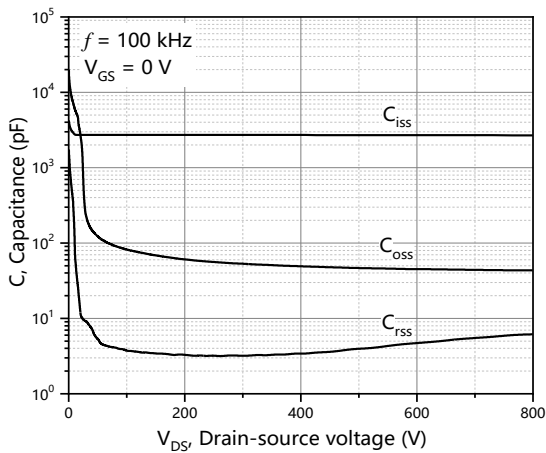


Figure 3. Typ. capacitances

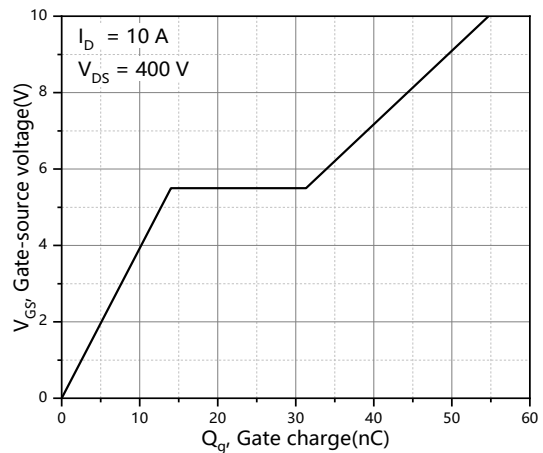


Figure 4. Typ. gate charge

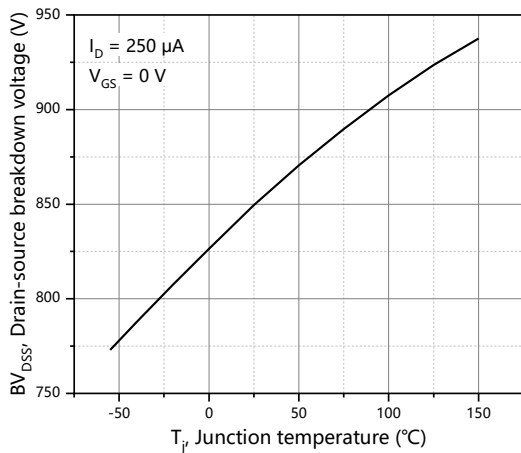


Figure 5. Drain-source breakdown voltage

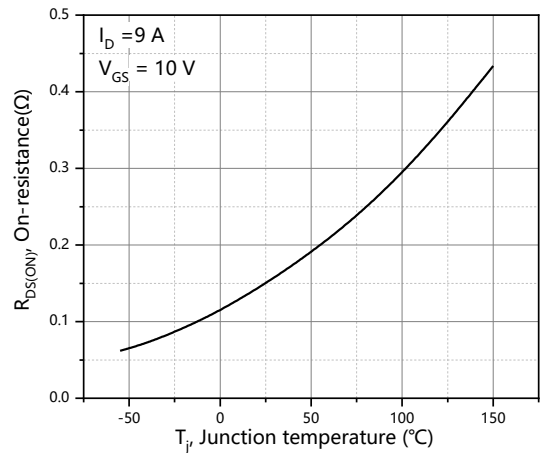


Figure 6. Drain-source on-state resistance

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

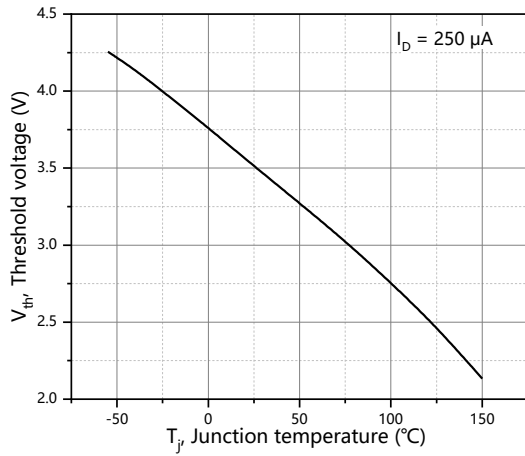


Figure 7. Threshold voltage

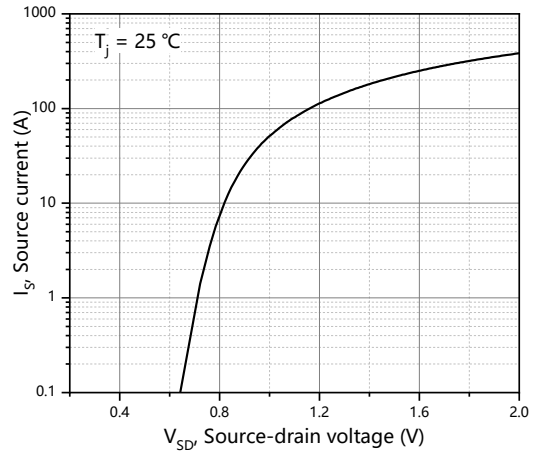


Figure 8. Forward characteristic of body diode

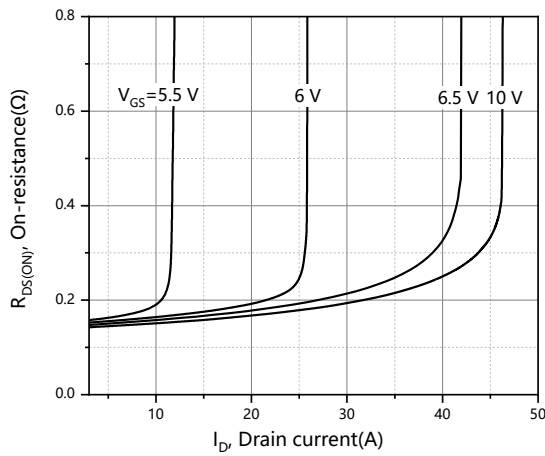


Figure 9. Drain-source on-state resistance

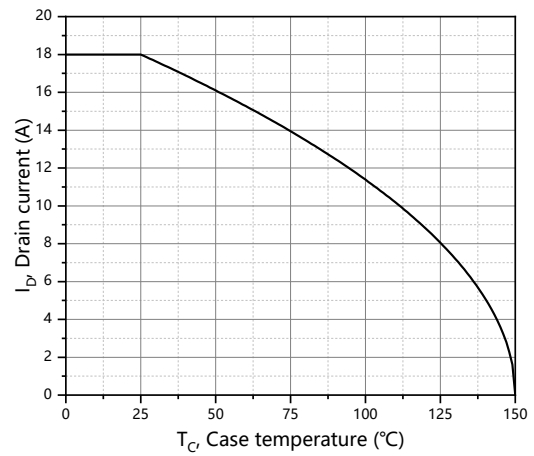


Figure 10. Drain current

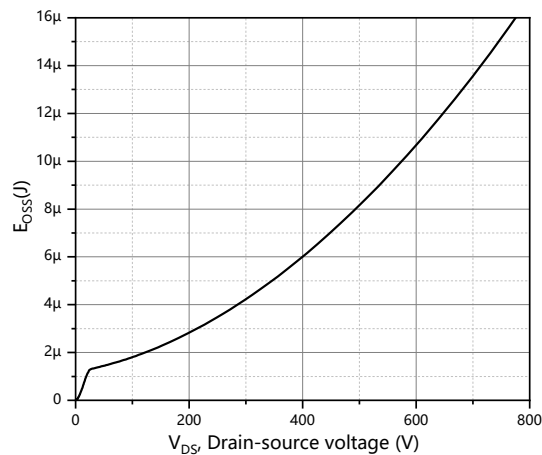


Figure 11. Typ. coss stored energy

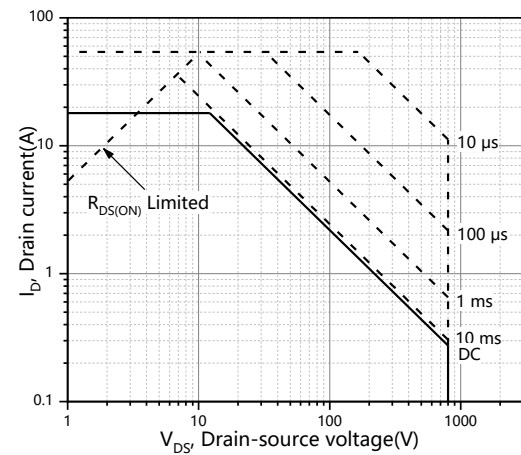


Figure 12. Safe operation area $T_C=25\text{ }^\circ\text{C}$

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

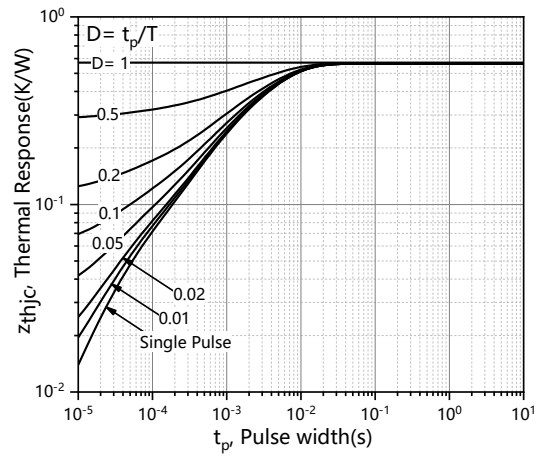
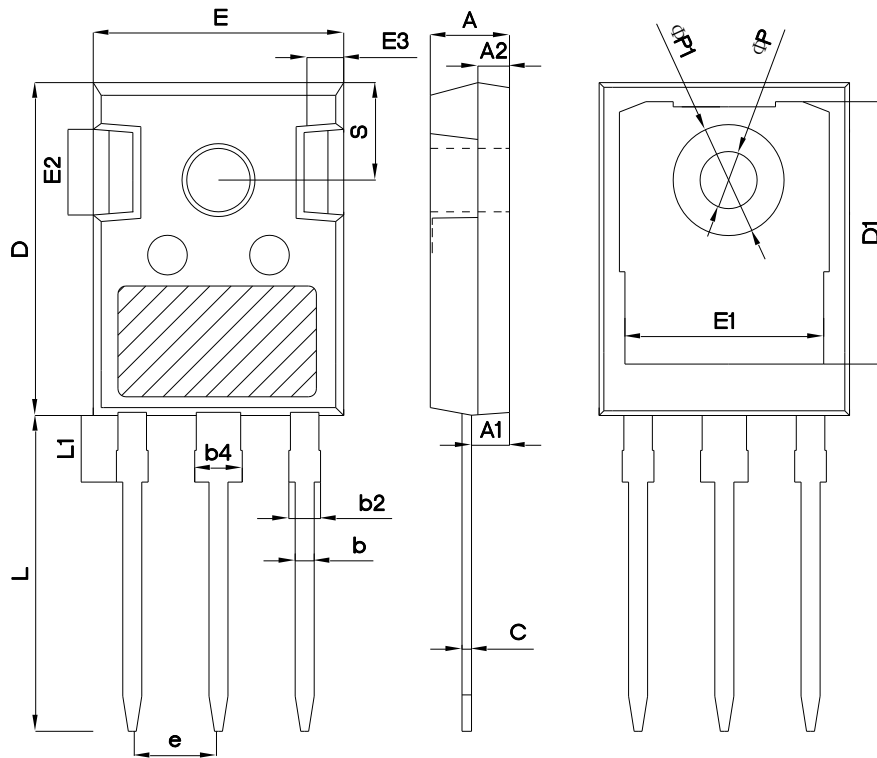


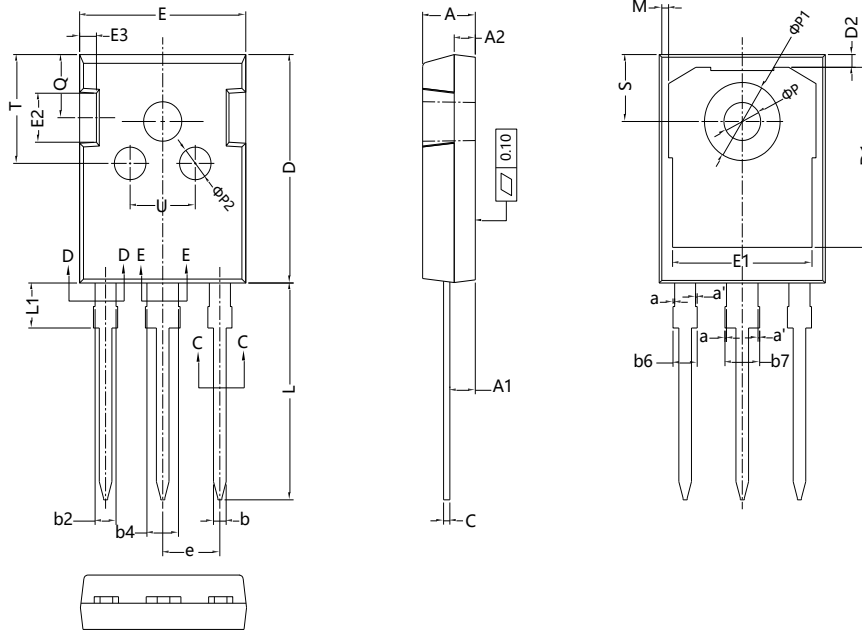
Figure 13. Max. transient thermal impedance

TO-247-P PACKAGE OUTLINE



Symbol	mm		
	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.80	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44BSC		
L	19.82	19.92	20.22
L1	-	-	4.30
ΦP	3.40	3.60	3.80
ΦP1	-	-	7.30
S	6.15BSC		

TO-247-J PACKAGE OUTLINE



Symbol	mm		
	Min	Nom	Max
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
a	0.00	-	0.15
a'	0.00	-	0.15
b	1.16	-	1.26
b2	1.96	-	2.06
b4	2.96	-	3.06
b6	-	-	2.25
b7	-	-	3.25
c	0.59	-	0.66
c1	0.58	0.60	0.62
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.17	1.35
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	4.40	4.50	4.60
E3	1.50	1.60	1.70
e	5.436 BSC		
L	19.80	19.92	20.10
L1	-	-	4.30
M	0.35	-	0.95
P	3.40	3.50	3.60
P1	7.00	-	7.40
P2	2.40	2.5	2.6
Q	5.60	-	6.0
S	6.05	6.15	6.25
T	9.8	-	10.20
U	6.00	-	6.40

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