

N-Channel 200 V (D-S) Power MOSFET



RoHS
COMPLIANT

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ) (Typ.)	I _D (A) ^a	Q _g (Typ.)
200	12 at V _{GS} = 10 V	130	72 nC

FEATURES

- DT-Trench Power MOSFET
- 175 °C Junction Temperature
- PWM Optimized
- 100 % R_g and UIS Tested

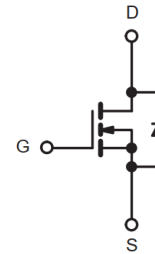
APPLICATIONS

- Primary Side Switch

TO-263



Top View



N-Channel MOSFET

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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	200	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 175 °C)	I _D	T _C = 25 °C	130
		T _C = 100 °C	97
Pulsed Drain Current	I _{DM}	390	A
Single Avalanche Energy	E _{AS}	155	mJ
Maximum Power Dissipation	P _D	T _C = 25 °C	380 ^a
		T _C = 100 °C	152 ^a
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) ^{b,c}	R _{thJA}	40	°C/W
Junction-to-Case (Drain)	R _{thJC}	0.4	

Notes:

a. Based on T_C = 25 °C.

b. Surface mounted on 1" x 1" FR4 board.

c. t = 10 s.

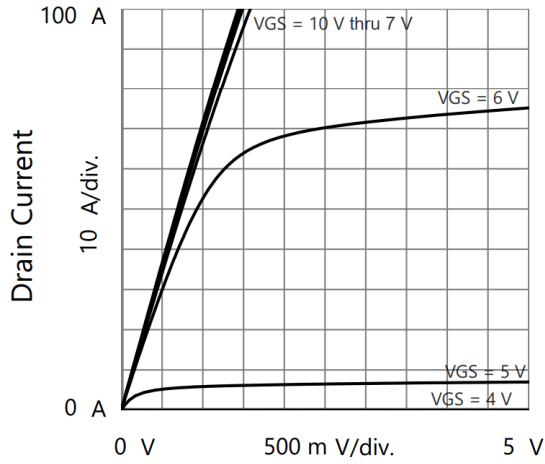
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	200	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2	-	4	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 200\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	μA
		$V_{DS} = 160\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$	-	-	100	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	130	-	-	A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 30\text{ A}$	-	12	16	m Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 30\text{ A}$	-	80	-	S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 100\text{ V}, f = 1\text{ MHz}$	-	5170	-	pF
Output Capacitance	C_{oss}		-	390	-	
Reverse Transfer Capacitance	C_{rss}		-	15	-	
Total Gate Charge ^c	Q_g	$V_{DS} = 100\text{ V}, V_{GS} = 10\text{ V}, I_D = 30\text{ A}$	-	72	-	nC
Gate-Source Charge ^c	Q_{gs}		-	23	-	
Gate-Drain Charge ^c	Q_{gd}		-	13	-	
Gate Resistance	R_g	$f = 1\text{ MHz}$	-	6	-	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 100\text{ V}, I_D = 30\text{ A}, R_g = 2.5\text{ }\Omega$ $V_{GS} = 10\text{ V}$	-	13	-	ns
Rise Time ^c	t_r		-	48	-	
Turn-Off Delay Time ^c	$t_{d(off)}$		-	27	-	
Fall Time ^c	t_f		-	58	-	
Drain-Source Body Diode Ratings and Characteristics ^b ($T_C = 25\text{ }^\circ\text{C}$)						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$	-	-	130	A
Pulsed Current ($t = 100\text{ }\mu\text{s}$)	I_{SM}		-	-	390	A
Forward Voltage ^a	V_{SD}	$I_F = 30\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.2	V
Reverse Recovery Time	t_{rr}	$I_F = 30\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	-	185	-	ns
Reverse Recovery Charge	Q_{rr}		-	120	-	nC

Notes

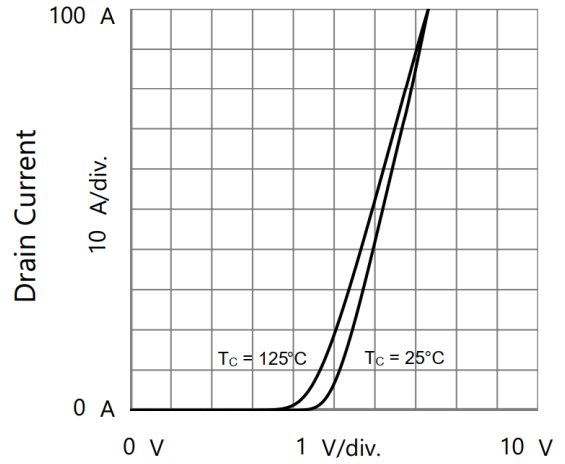
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

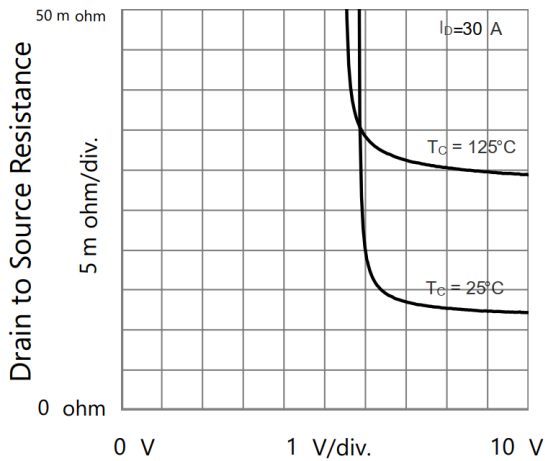
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



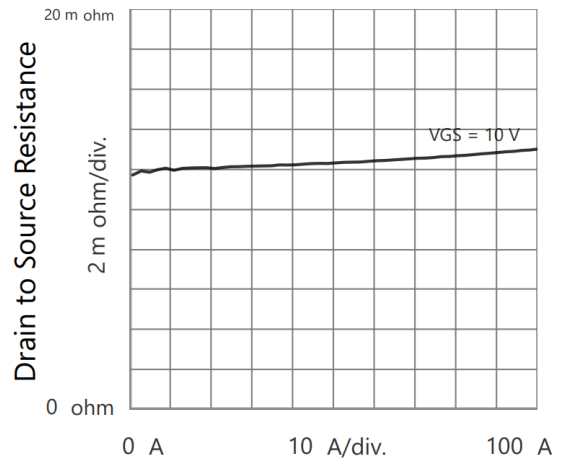
Drain to Source Voltage Output Characteristics



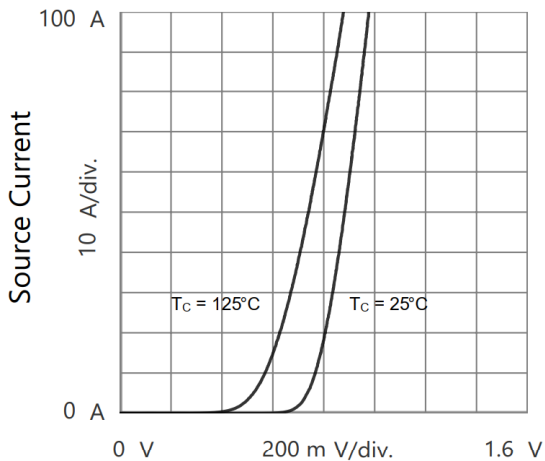
Gate to Source Voltage Transfer Characteristics



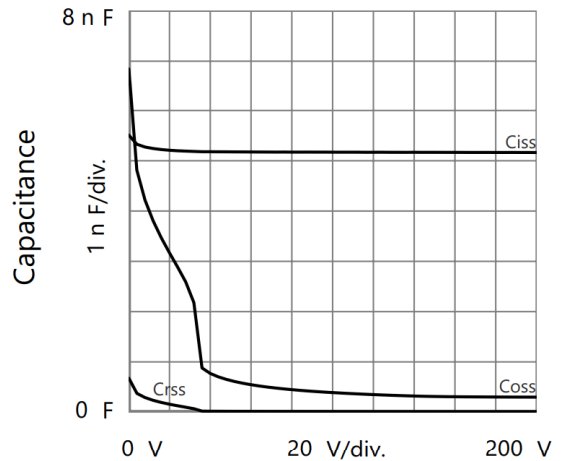
Gate to Source Voltage Drain to Source Resistance vs. Gate to Source Voltage



Drain Current Drain to Source Resistance vs. Drain Current

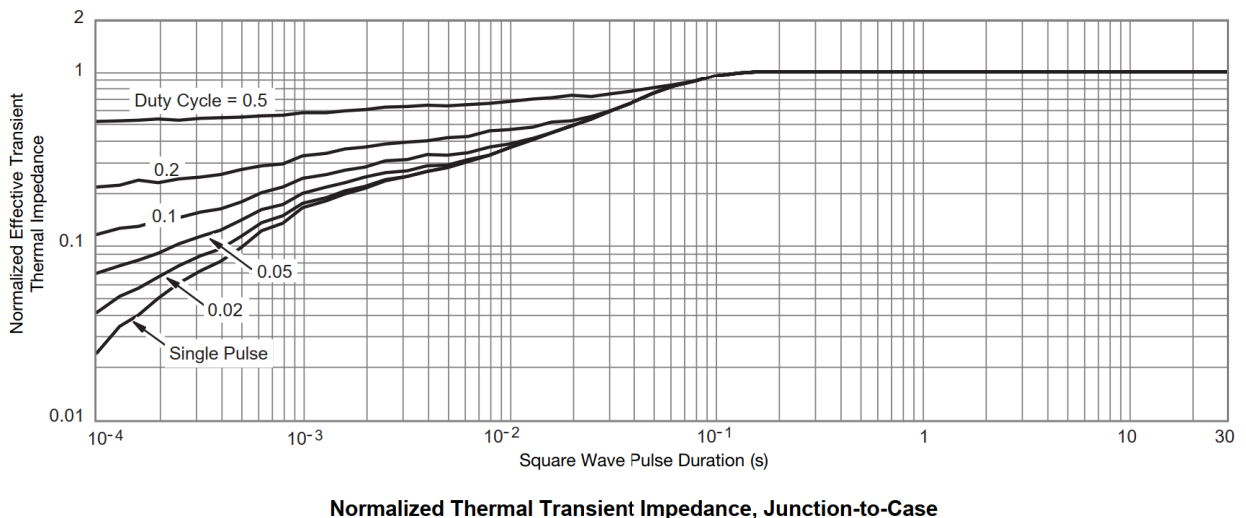
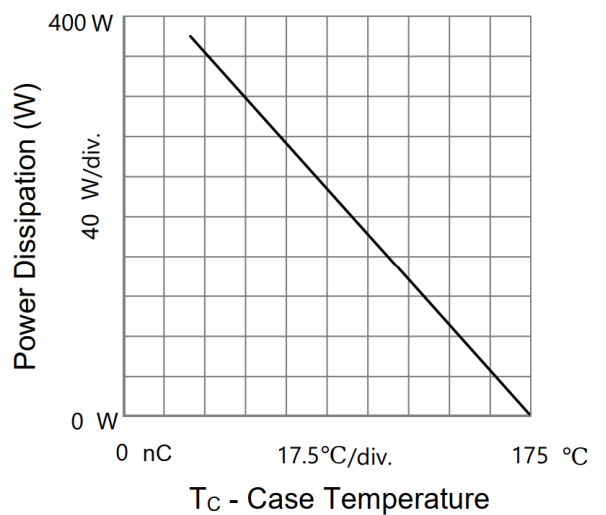
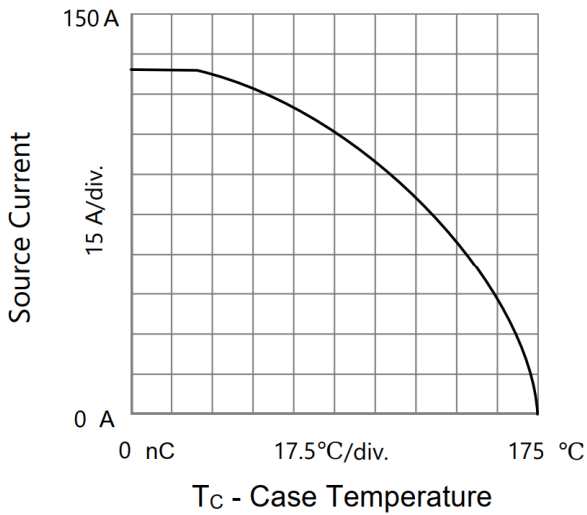
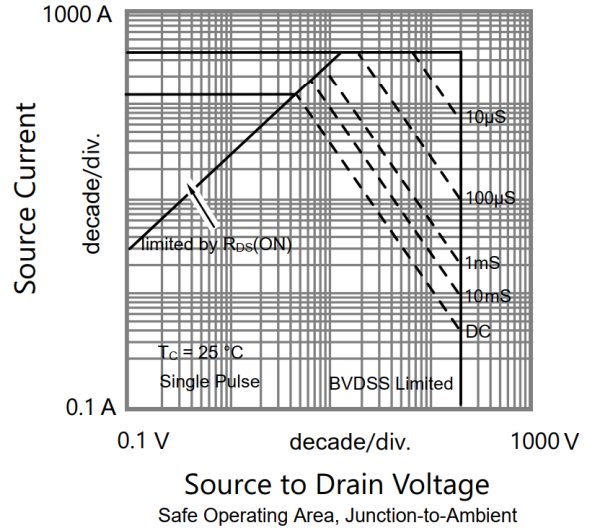
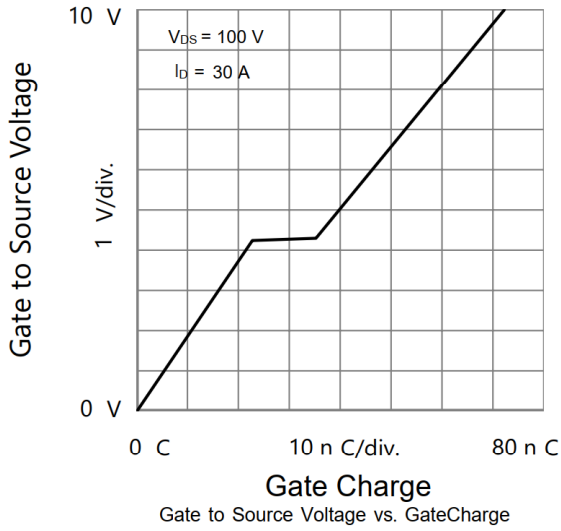


Source to Drain Voltage Body Diode Forward Characteristics

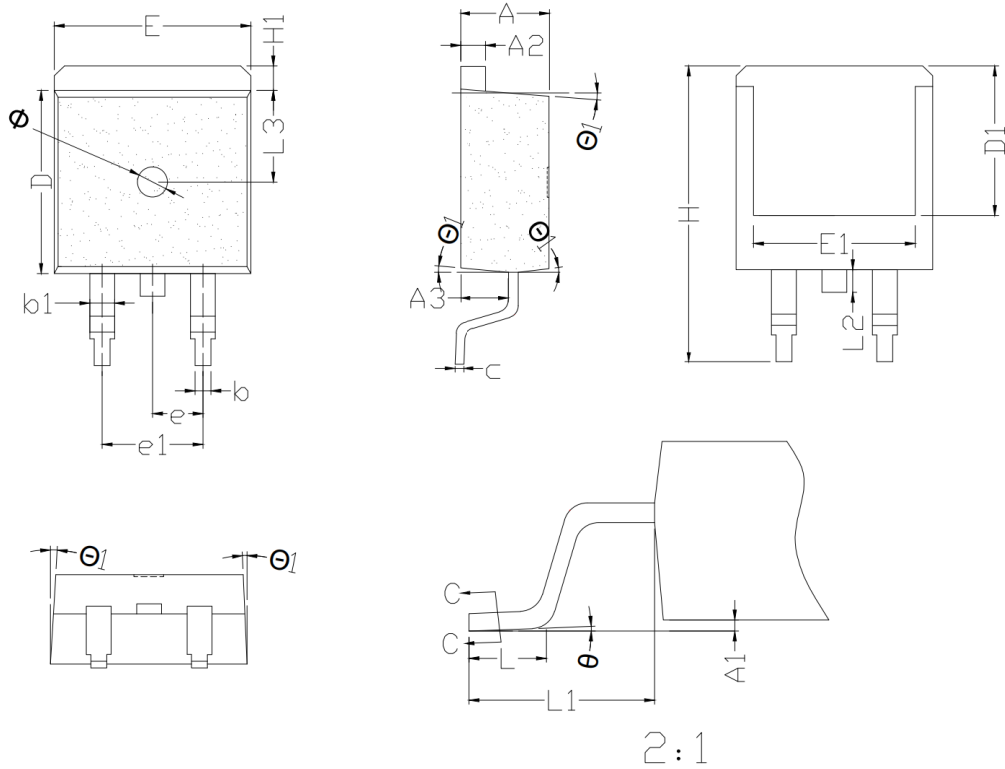


Drain to Source Voltage Capacitances

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



TO-263 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX	SYMBOL	MIN	TYP	MAX
A	4.10	4.50	4.80	e	2.35	2.54	2.75
A1	0.00	0.10	0.30	e1	5.08REF		
A2	1.10	1.30	1.50	H	14.50	15.15	16.00
A3	2.15	2.50	3.10	H1	1.00	1.28	1.75
b	0.60	0.80	1.05	L	1.80	2.23	2.90
b1	1.05	1.33	1.50	L1	4.30	4.75	5.50
c	0.33	0.50	0.66	L2	1.00	1.30	1.85
D	8.40	9.20	9.60	L3	0.90	4.65	9.00
D1	7.50REF			phi	0°	2°	5°
E	9.60	10.02	10.80	phi1	2°	-	7°
E1	7.60	9.88	10.30	Phi	1.5BSC		

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