N-Channel 100 V (D-S) Super Junction MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (mΩ)(Typ.)	I_D (A)[a]	Q_g (Typ.)
100	2.3 at V_{GS} = 10 V	250	127 nC

FEATURES

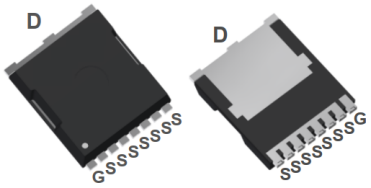
- DT-SJ Power MOSFET
- Very low on-resistance
- Excellent gate charge x $R_{DS(on)}$ product(FOM)

RoHS COMPLIANT

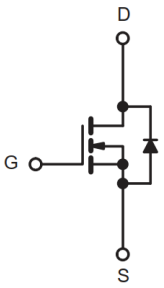
APPLICATIONS

- Power Management
- Motor Drivers
- DC-DC Converters

TOLL Pin Configuration



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 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 (T_J = 150 °C)	T_C = 25 °C	I_D	250	A
	T_C = 100 °C		187	
Pulsed Drain Current		I_{DM}	1000	
Single Pulse Avalanche Energy	L = 0.5 mH	E_{AS}	1800	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	360[c]	W
	T_C = 100 °C		144	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature)			260	

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[b]	t ≤ 10 s	R_{thJA}	35	45	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	0.3	0.35	

Notes:
a. Based on T_C = 25 °C.
b. Surface mounted on 1" x 1" FR4 board.
c. See SOA curve for voltage derating

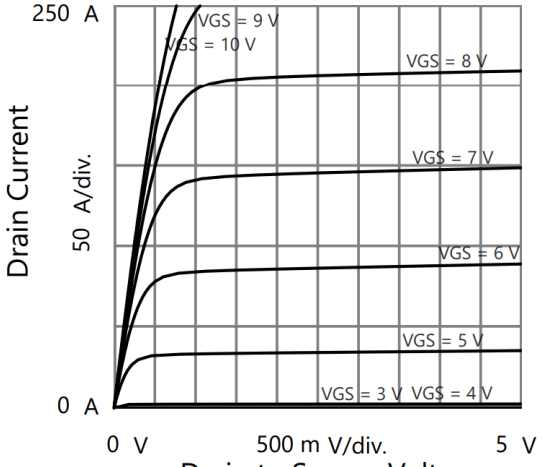
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2	-	4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 80 V, V_{GS} = 0 V, T_J= 55°C	-	-	10	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} ≥ 10 V, V_{GS} = 10 V	250	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 50 A	-	2.3	2.8	mΩ
Forward Transconductance [a]	g_{fs}	V_{DS} = 5 V, I_D = 50 A	100	-	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 50 V, f = 1MHz	-	7500	-	pF
Output Capacitance	C_{oss}		-	906	-	
Reverse Transfer Capacitance	C_{rss}		-	32	-	
Total Gate Charge [c]	Q_g	V_{DS} = 50 V, V_{GS} = 10 V, I_D = 50 A	-	127	-	nC
Gate-Source Charge [c]	Q_{gs}		-	45	-	
Gate-Drain Charge [c]	Q_{gd}		-	47	-	
Gate Resistance	R_g	f = 1 MHz	-	1	-	Ω
Turn-On Delay Time [c]	$t_{d(on)}$	V_{DD} = 50 V, R_g = 3 Ω, V_{GEN} = 10 V	-	45	-	ns
Rise Time [c]	t_r		-	53	-	
Turn-Off Delay Time [c]	$t_{d(off)}$		-	76	-	
Fall Time [c]	t_f		-	30	-	
Drain-Source Body Diode Ratings and Characteristics [b] (T_C = 25 °C)						
Continuous Source Current	I_S	T_C = 25 °C	-	-	250	A
Pulsed Source Current	I_{SM}		-	-	1000	A
Forward Voltage [a]	V_{SD}	I_F = 50 A, V_{GS} = 0 V	-	-	1.2	V
Reverse Recovery Time	t_{rr}	I_F = 50 A, di/dt = 500 A/µs	-	112	-	ns
Reverse Recovery Charge	Q_{rr}		-	313	-	nC

Notes

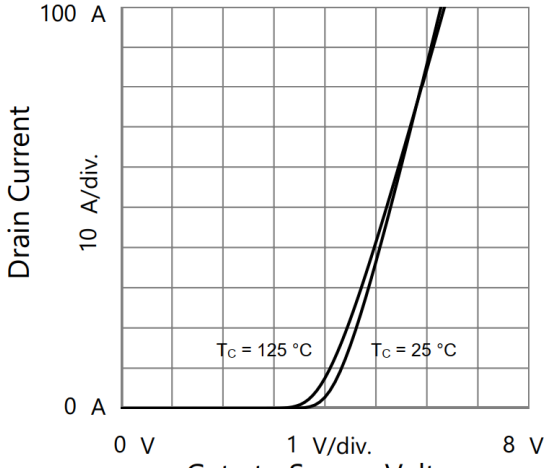
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

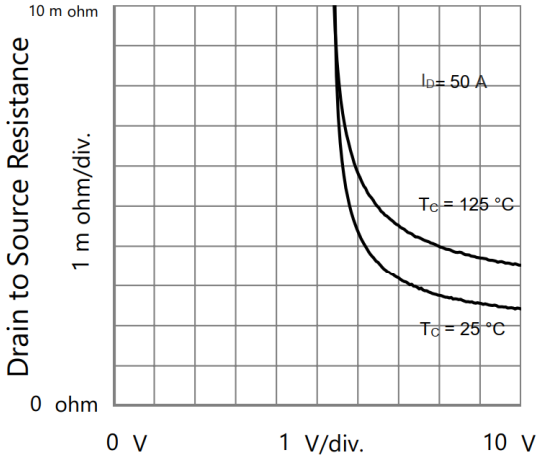
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



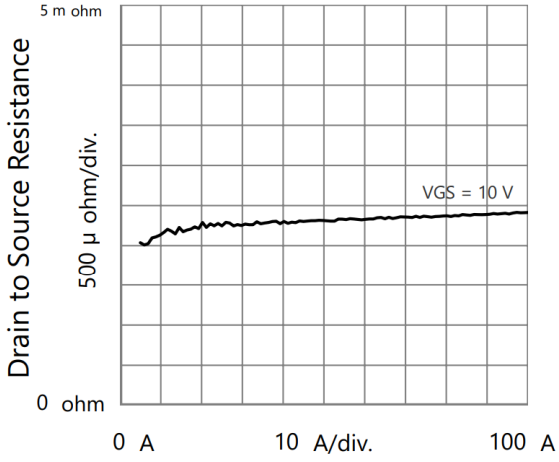
Output Characteristics



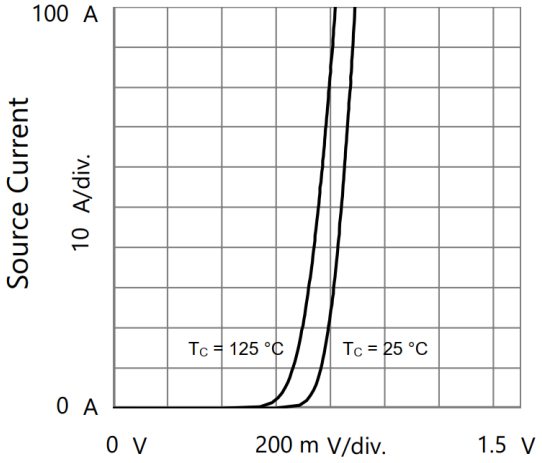
Transfer Characteristics



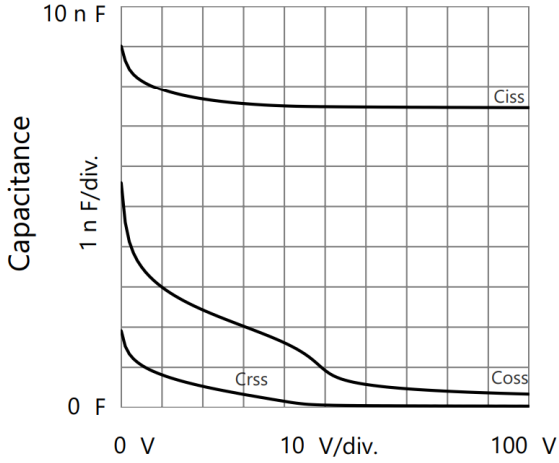
Drain to Source Resistance vs. Gate to Source Voltage



Drain to Source Resistance vs. Drain Current

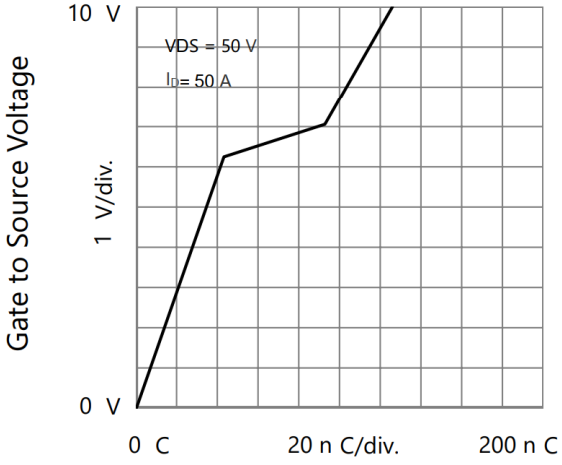


Body Diode Forward Characteristics

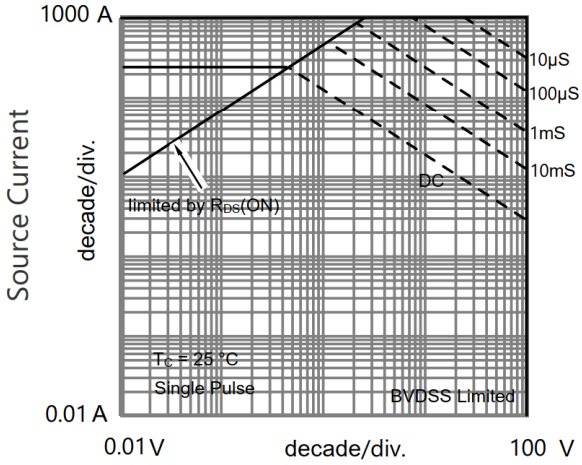


Capacitances

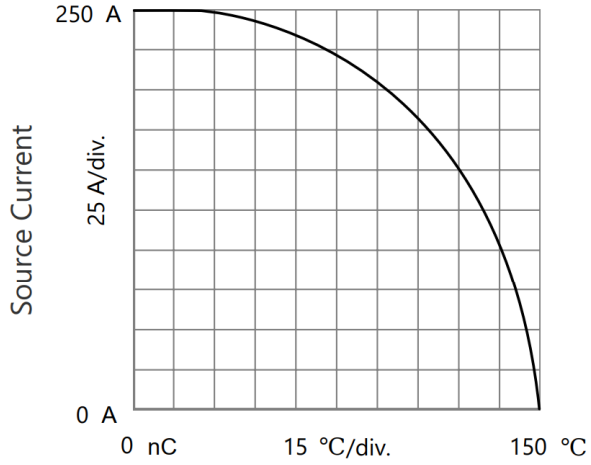
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



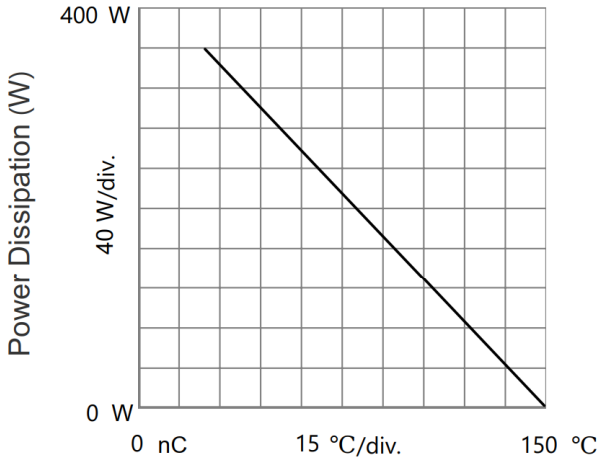
Gate to Source Voltage vs. GateCharge



Safe Operating Area, Junction-to-Ambient



Current Derating



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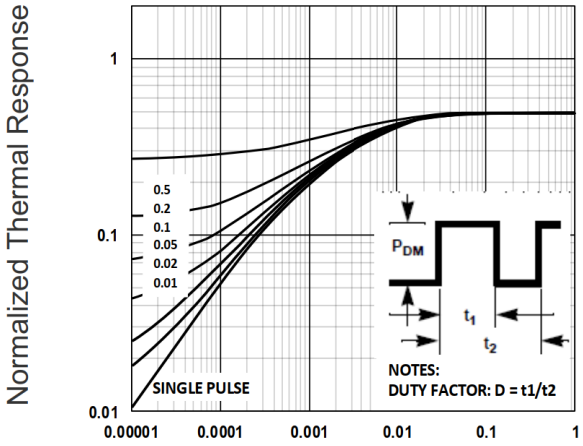
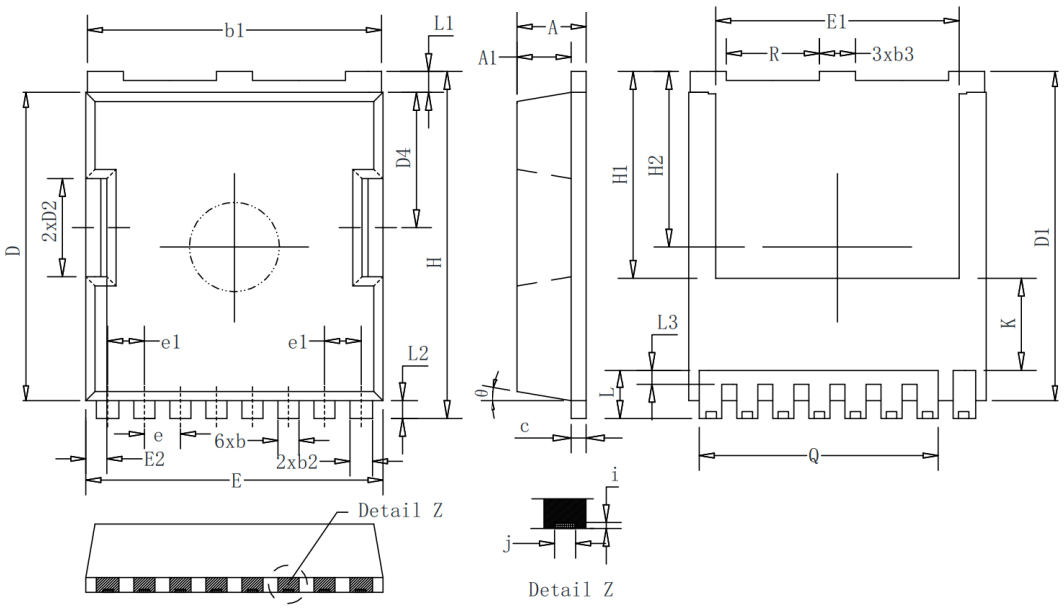


Normalized Thermal Transient Impedance, Junction-to-Ambient

TOLL PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Typ	Max		Symbol	Min	Typ	Max
A	2.05	2.30	2.65		E2	0.40	0.70	0.90
A1	1.50	1.80	2.10		H	11.30	11.70	12.10
b	0.50	0.70	0.90		H1	6.95 BSC		
b1	9.50	9.80	10.05		H2	5.90 BSC		
b2	0.50	0.75	1.00		i	0.10 REF		
b3	1.00	1.20	1.45		j	0.35 REF		
c	0.30	0.50	0.75		K	3.10 REF		
D	10.10	10.40	10.70		L	1.45	1.65	1.85
D1	10.80	11.10	11.40		L1	0.50	0.70	0.90
D2	3.10	3.30	3.50		L2	0.40	0.60	0.80
D4	4.35	4.55	4.80		L3	0.30	0.50	0.70
e	1.20 BSC				Q	7.95 REF		
e1	1.225 BSC				R	2.80	3.10	3.35
E	9.65	9.90	10.15		θ	10°REF		
E1	7.80	8.10	8.50					

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