N-Channel 40 V (D-S) Super Junction Power MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (mΩ) (TYP.)	I_D (A)[a,d]	Q_g (TYP.)
40	0.85 at V_{GS} = 10 V	255	97 nC

RoHS COMPLIANT

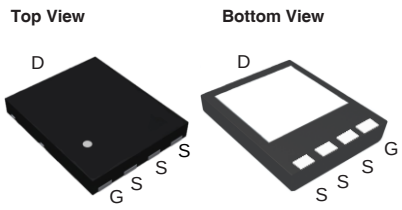
FEATURES

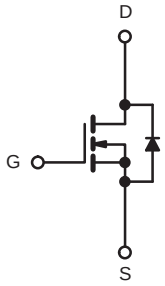
- DT-SJ Power MOSFET
- 100 % R_g and UIS Tested
- Excellent Gate Charge x RDS(ON) Product (FOM)

APPLICATIONS

- Power Management
- Motor Drivers
- DC-DC Converters

DFN8X8 Pin Configuration





N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 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)[a]	T_C = 25 °C	I_D	255	A
	T_C = 100 °C		171	
Pulsed Drain Current[b]		I_{DM}	900	
Single Pulse Avalanche Energy		E_{AS}	802	mJ
Maximum Power Dissipation[c]	T_C = 25 °C	P_D	345	W
	T_C = 100 °C		125	
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[d]	t ≤ 10 s	R_{thJA}	-	32	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	-	0.36	

Notes

a. Calculated continuous current based on maximum allowablejunction temperature.
b. Repetitive rating; pulse width limited by max. junction temperature.
c. Pd is based on max. junction temperature, using junction-case thermal resistance.
d. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper,in a still air environment with Ta=25 °C.

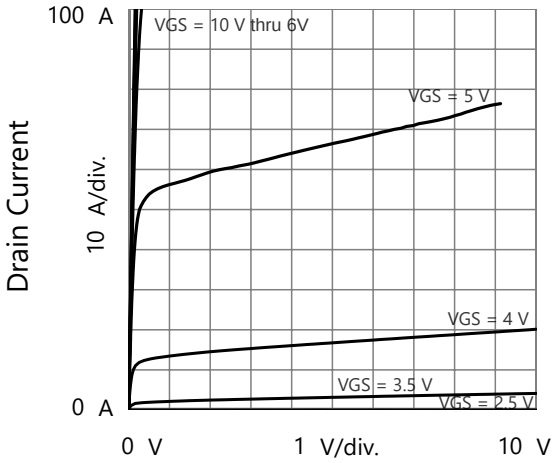
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	40	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2	-	4	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 36 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	255	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 30 A	-	0.85	1.05	mΩ
Forward Transconductance [a]	g_{fs}	V_{DS} = 15 V, I_D = 30 A	-	85	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 20 V, f = 1 MHz	-	6890	-	pF
Output Capacitance	C_{oss}		-	2015	-	
Reverse Transfer Capacitance	C_{rss}		-	277	-	
Total Gate Charge [c]	Q_g	V_{DS} = 20 V, V_{GS} = 10 V, I_D = 30 A	-	97	-	nC
Gate-Source Charge [c]	Q_{gs}		-	20	-	
Gate-Drain Charge [c]	Q_{gd}		-	12	-	
Gate Resistance	R_g	f = 1 MHz	-	2	-	Ω
Turn-On Delay Time [c]	$t_{d(on)}$	V_{DD} = 20 V, R_L = 2 Ω I_D = 30 A, V_{GEN} = 10 V, R_g = 3 Ω	-	16	-	ns
Rise Time [c]	t_r		-	11	-	
Turn-Off Delay Time [c]	$t_{d(off)}$		-	57	-	
Fall Time [c]	t_f		-	10	-	
Drain-Source Body Diode Ratings and Characteristics [b] (T_C = 25 °C)						
Continuous Source Current	I_S	T_C = 25 °C	-	-	255	A
Pulsed Source Current	I_{SM}		-	-	900	A
Forward Voltage [a]	V_{SD}	I_F = 1 A, V_{GS} = 0 V	-	-	1.2	V
Reverse Recovery Time	t_{rr}	I_F = 30 A, di/dt = 100 A/µs	-	40	-	ns
Reverse Recovery Charge	Q_{rr}		-	120	-	nC

Notes

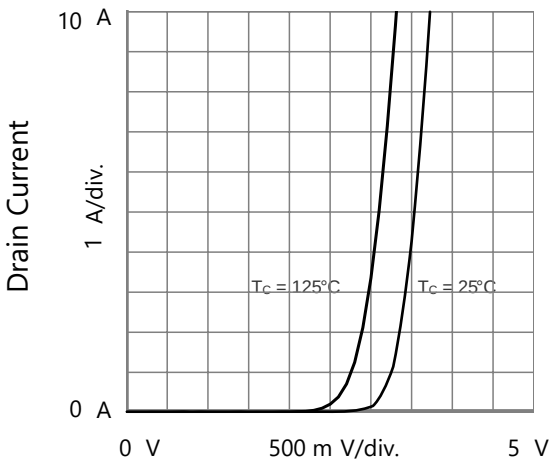
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

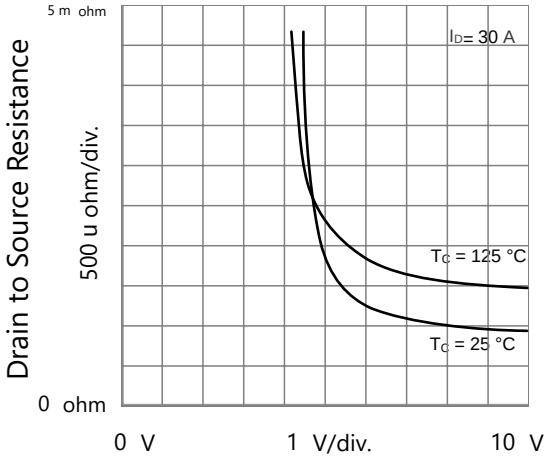
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



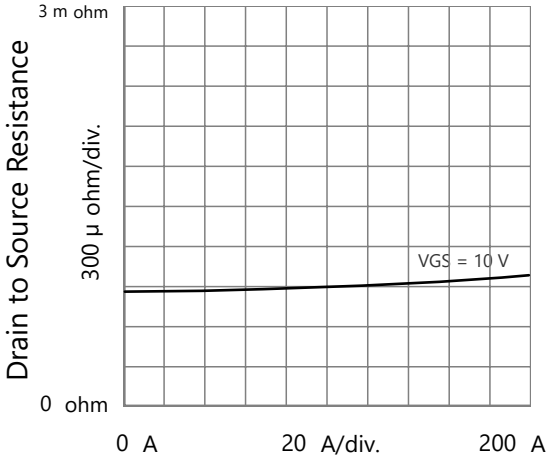
Drain to Source Voltage
Output Characteristics



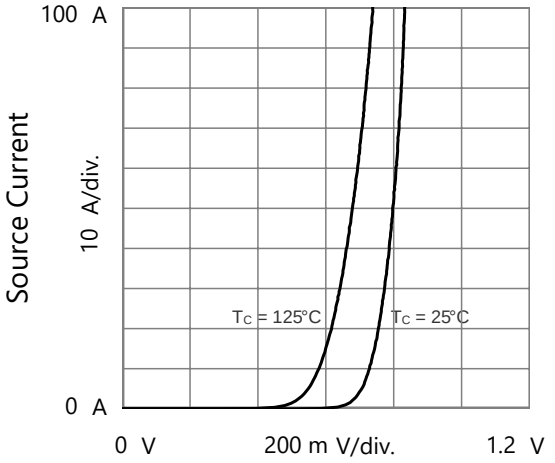
Gate to Source Voltage
Transfer Characteristics



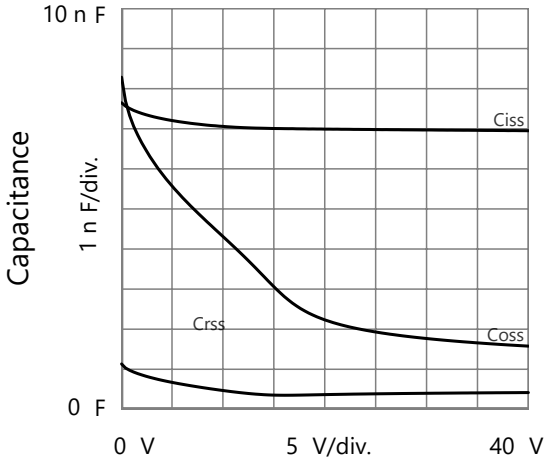
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

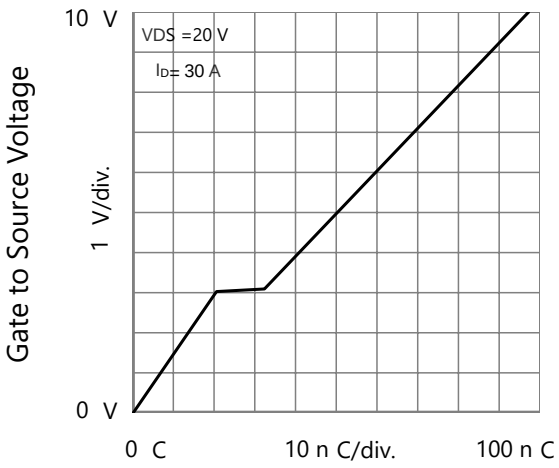


Source to Drain Voltage
Body Diode Forward Characteristics

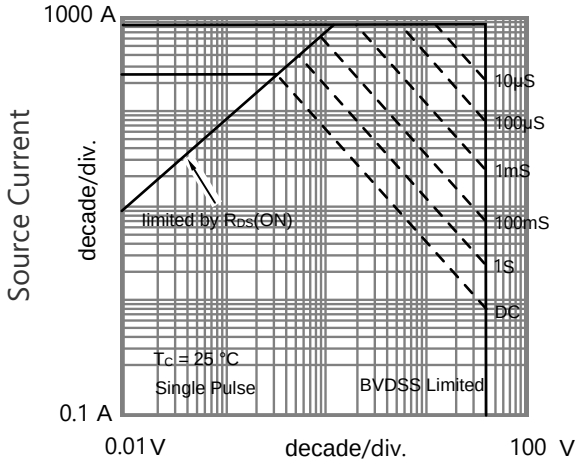


Drain to Source Voltage
Capacitances

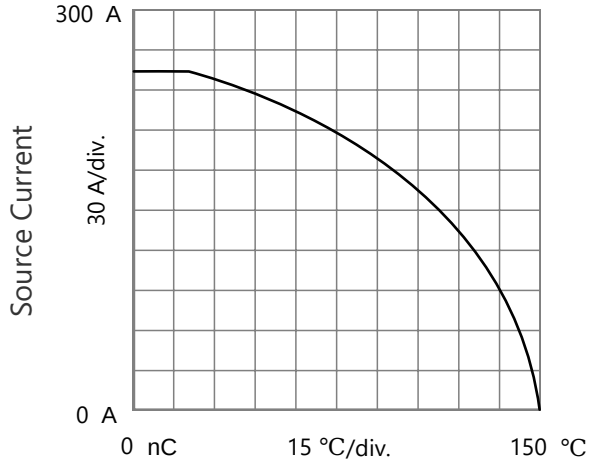
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



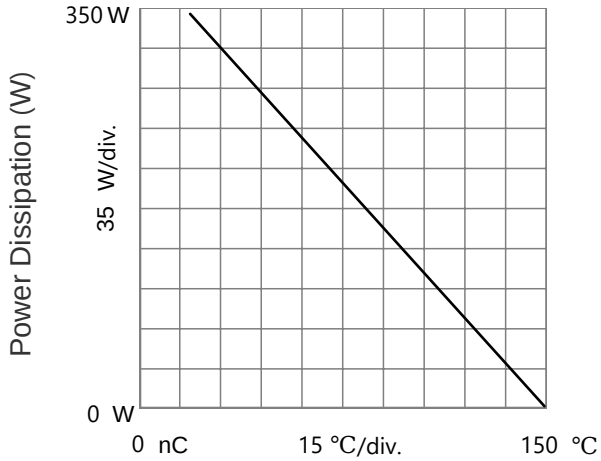
Gate to Source Voltage vs. GateCharge



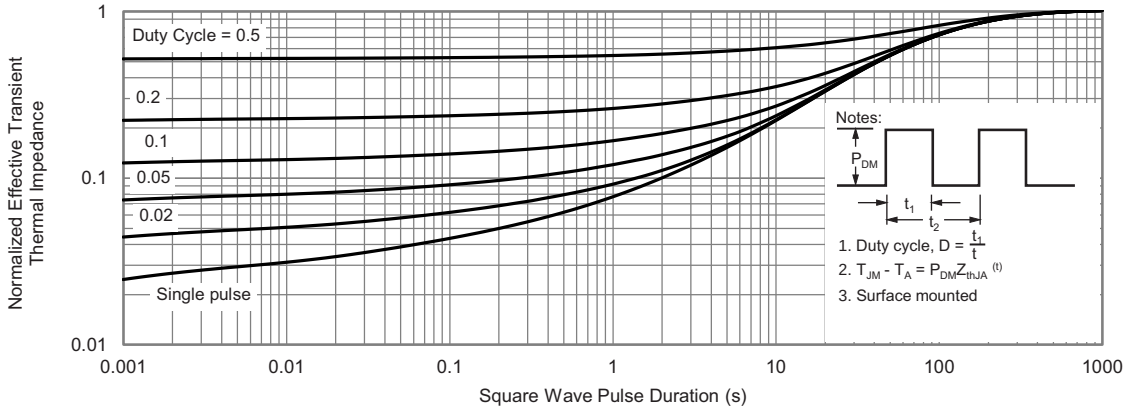
Safe Operating Area, Junction-to-Ambient



Current Derating

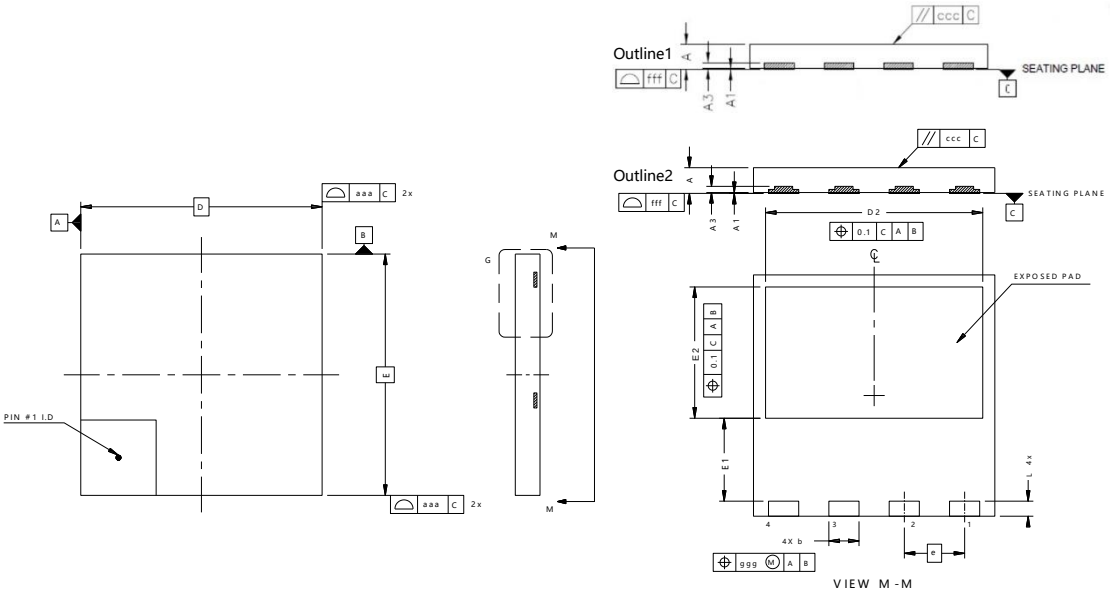


Current Derating



Normalized Thermal Transient Impedance, Junction-to-Ambient

DFN8*8 PACKAGE OUTLINE



Symbol	mm	
	Min	Max
A	0.75	1.15
A1	0.00	0.05
A3	0.10	0.30
b	0.90	1.10
D	7.85	8.15
E	7.85	8.15
D2	7.10	7.30
E1	2.65	2.85
E2	4.25	4.45
e	2.0 BSC	
L	0.40	0.60
aaa	0.1	
ggg	0.05	
ccc	0.05	
fff	0.05	

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