

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


RoHS
 COMPLIANT

PRODUCT SUMMARY

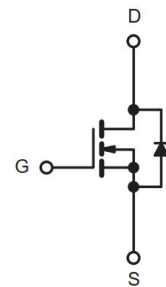
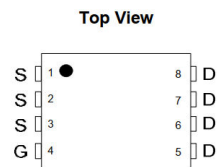
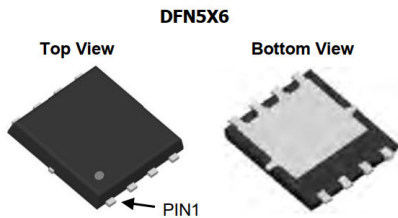
V_{DS} (V)	$R_{DS(on)}$ (m Ω) (TYP.)	I_D (A) ^d	Q_g (TYP.)
80	3.5 at $V_{GS} = 10$ V	120	48 nC

FEATURES

- DT-SJ Power MOSFET
- 100 % R_g and UIS Tested
- Low $R_{DS(ON)}$

APPLICATIONS

- Load Switch
- DC Motor Drive and BMS industrial application.
- Synchronous Rectification in DC/DC and AC/DC Converters.



N-Channel MOSFET

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)	$T_C = 25$ °C	I_D 120	A
	$T_C = 100$ °C	90	
Pulsed Drain Current ($t = 100$ μ s)	I_{DM}	420	
Avalanche Current	I_{AS}	90	mJ
Single Avalanche Energy ^a	E_{AS}	670	
Maximum Power Dissipation ^a	$T_C = 25$ °C	P_D 173 ^b	W
	$T_C = 100$ °C	110 ^b	
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) ^c	R_{thJA}	50	°C/W
Junction-to-Case (Drain)	R_{thJC}	0.72	

Notes

- Duty cycle 1 %.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR4 material).
- Based on $T_C = 25$ °C.

SPECIFICATIONS ($T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

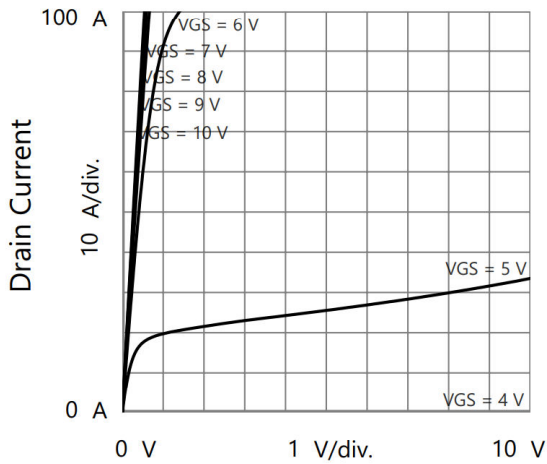
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	80	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	2	-	4	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{ V}$, $V_{GS} = 0\text{ V}$	-	-	1	μA
		$V_{DS} = 64\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 85\text{ }^{\circ}\text{C}$	-	-	10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}$, $V_{GS} = 10\text{ V}$	120	-	-	A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$	-	3.5	4.2	m Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = 5\text{ V}$, $I_D = 20\text{ A}$	-	90	-	S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 40\text{ V}$, $f = 1\text{ MHz}$	-	2890	-	pF
Output Capacitance	C_{oss}		-	715	-	
Reverse Transfer Capacitance	C_{rss}		-	26	-	
Total Gate Charge ^c	Q_g	$V_{DS} = 40\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$	-	48	-	nC
Gate-Source Charge ^c	Q_{gs}		-	12	-	
Gate-Drain Charge ^c	Q_{gd}		-	9.7	-	
Gate Resistance	R_g	$f = 1\text{ MHz}$	-	1.9	-	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 40\text{ V}$, $R_g = 3\text{ }\Omega$ $I_D = 20\text{ A}$, $V_{GEN} = 10\text{ V}$	-	18	-	ns
Rise Time ^c	t_r		-	11	-	
Turn-Off Delay Time ^c	$t_{d(off)}$		-	35	-	
Fall Time ^c	t_f		-	10	-	
Drain-Source Body Diode Ratings and Characteristics ^b ($T_C = 25\text{ }^{\circ}\text{C}$)						
Continuous Source Current	I_S	$T_C = 25\text{ }^{\circ}\text{C}$	-	-	120	A
Pulsed Source Current	I_{SM}		-	-	480	A
Forward Voltage ^a	V_{SD}	$I_F = 1\text{ A}$, $V_{GS} = 0\text{ V}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$I_F = 20\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$	-	60	-	ns
Reverse Recovery Charge	Q_{rr}		-	136	-	nC

Notes

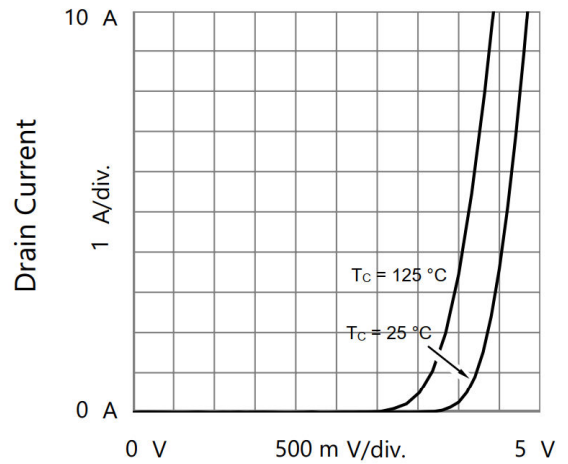
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

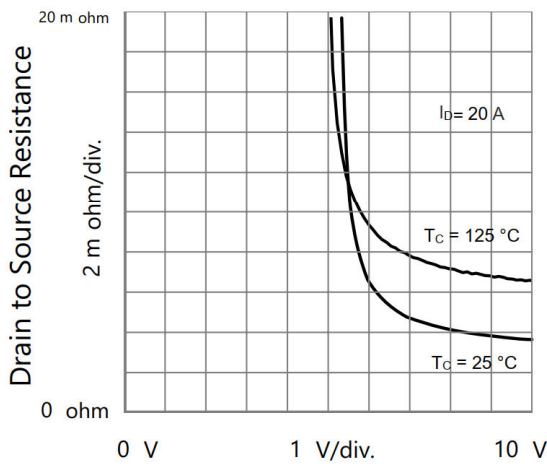
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)



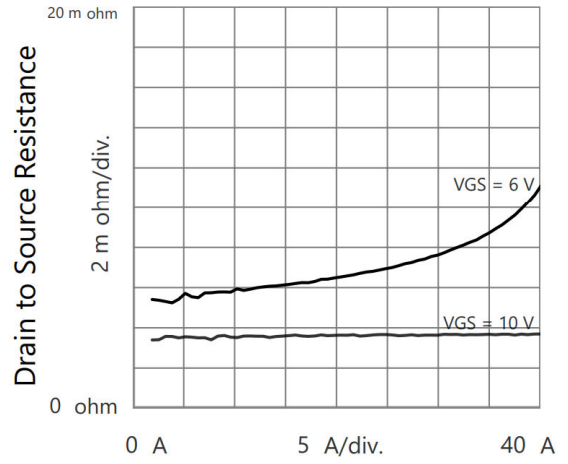
Drain to Source Voltage
Output Characteristics



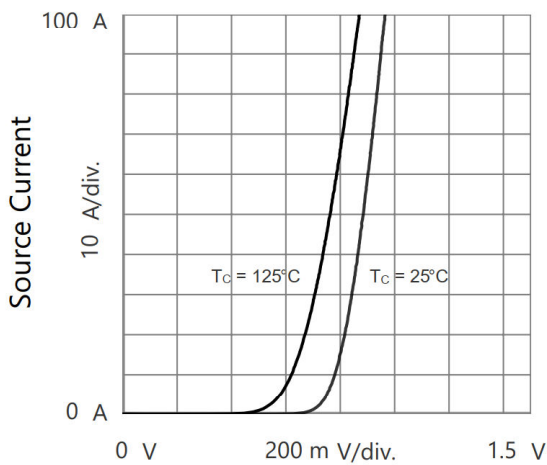
Gate to Source Voltage
Transfer Characteristics



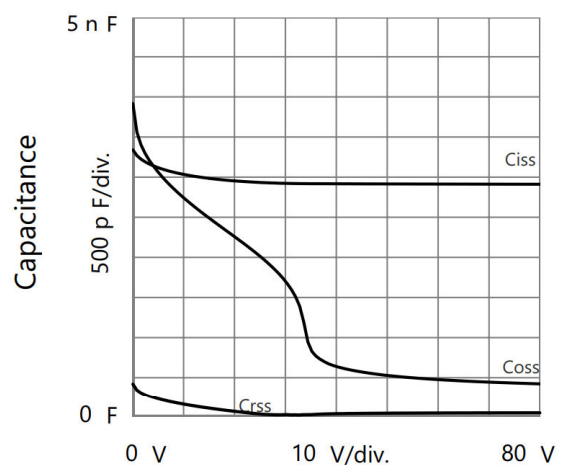
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

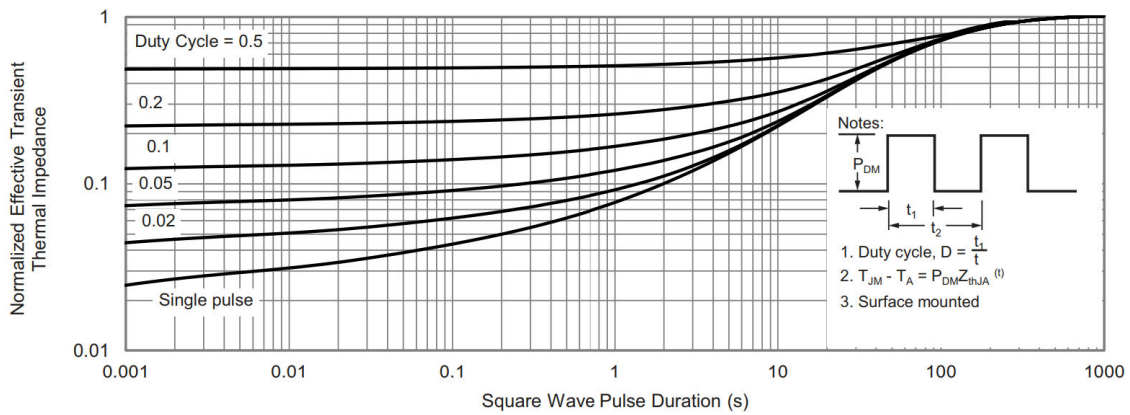
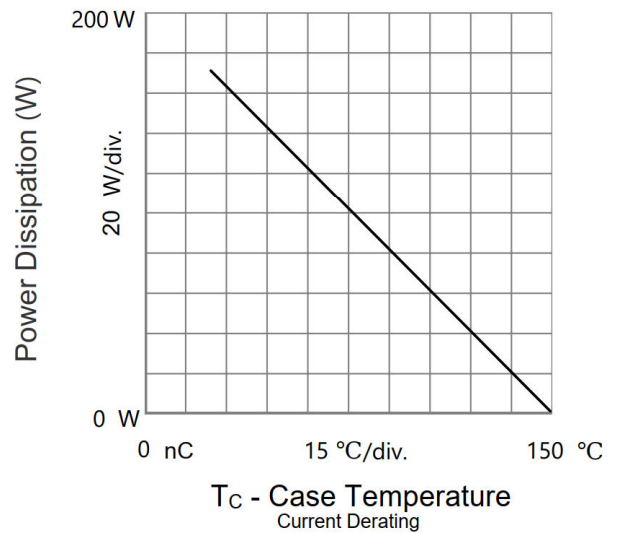
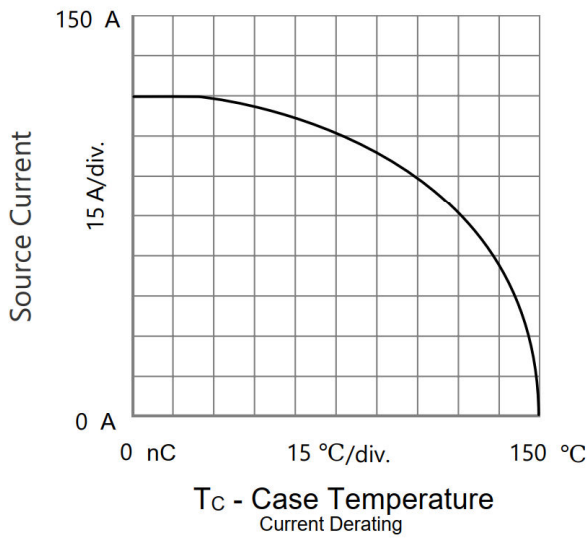
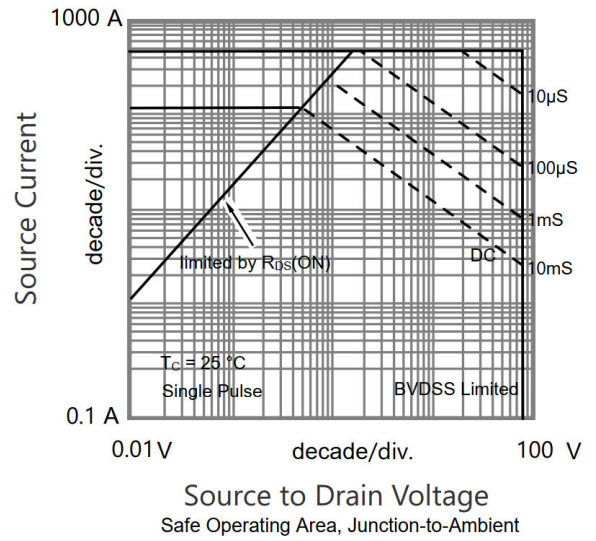
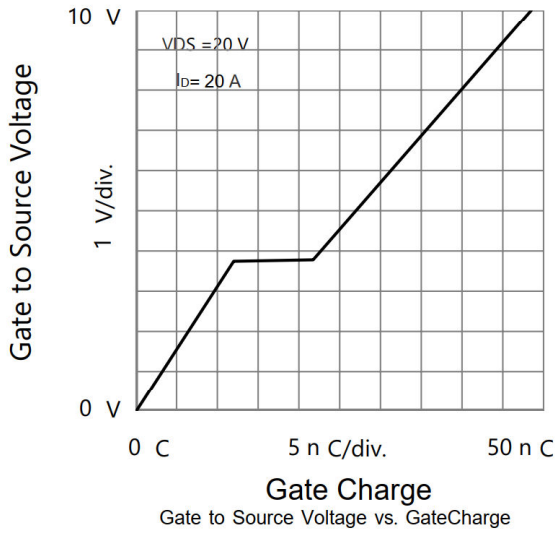


Source to Drain Voltage
Body Diode Forward Characteristics



Drain to Source Voltage
Capacitances

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



Normalized Thermal Transient Impedance, Junction-to-Ambient

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