

N-Channel 60 V (D-S) Super Junction MOSFET



RoHS
COMPLIANT

PRODUCT SUMMARY

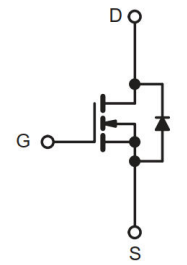
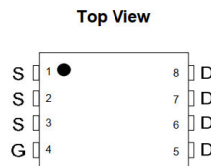
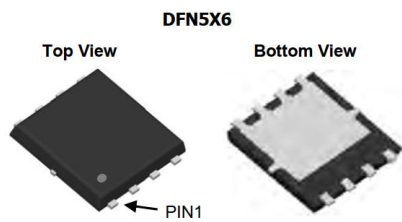
V_{DS} (V)	$R_{DS(on)}$ (m Ω) (Typ.)	I_D (A) ^a	Q_g (Typ.)
60	0.98 at $V_{GS} = 10$ V	200	116 nC
	1.75 at $V_{GS} = 4.5$ V		

FEATURES

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

APPLICATIONS

- Synchronous Rectification
- Motor Drives and Uninterruptible Power Supplies



N-Channel MOSFET

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

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V _{DS}	60	V
Gate-Source Voltage		V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	T _C = 25 °C	I _D	200	A
	T _C = 100 °C		126	
Pulsed Drain Current (t = 100 μs)		I _{DM}	800	
Single Avalanche Energy ^a	L = 0.5 mH	E _{AS}	506	mJ
Maximum Power Dissipation	T _C = 25 °C	P _D	175 ^{b,c}	W
	T _C = 100 °C		70 ^{b,c}	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +150	°C
Soldering Recommendations (Peak Temperature)			260	

THERMAL RESISTANCE RATINGS

PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^{b,d}	t ≤ 10 s	R _{thJA}	50	°C/W
Junction-to-Case (Drain)	Steady State	R _{thJC}	0.7	

Notes:

- $T_C = 25$ °C.
- Surface mounted on 1" x 1" FR4 board.
- $t = 10$ s.
- Maximum under steady state conditions is 60 °C/W.

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

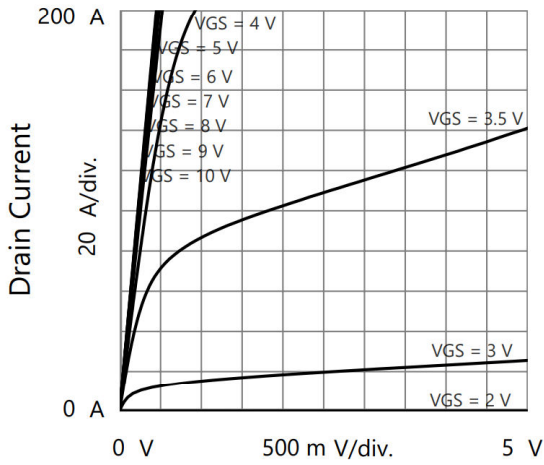
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	60	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1	-	3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 48 V, V _{GS} = 0 V, T _J = 125 °C	-	15	-	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 10 V, V _{GS} = 10 V	200	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 50 A	-	0.98	1.3	mΩ
		V _{GS} = 4.5 V, I _D = 40 A	-	1.75	2.3	
Forward Transconductance ^a	g _{fs}	V _{DS} = 5 V, I _D = 20 A	-	90	-	S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 30 V, f = 1 MHz	-	7540	-	pF
Output Capacitance	C _{oss}		-	1520	-	
Reverse Transfer Capacitance	C _{rss}		-	65	-	
Total Gate Charge ^c	Q _g	V _{DS} = 30 V, V _{GS} = 10 V, I _D = 50 A	-	116	-	nC
Gate-Source Charge ^c	Q _{gs}		-	16	-	
Gate-Drain Charge ^c	Q _{gd}		-	18	-	
Gate Resistance	R _g	f = 1 MHz	-	1.5	-	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 30 V, I _D = 50 A, R _g = 2.5 Ω V _{GS} = 4.5 V	-	39	-	ns
Rise Time ^c	t _r		-	34	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	52	-	
Fall Time ^c	t _f		-	27	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T _C = 25 °C)						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	-	-	200	A
Pulsed Current (t = 100 μs)	I _{SM}		-	-	800	A
Forward Voltage ^a	V _{SD}	I _F = 50 A, V _{GS} = 0 V	-	-	1.4	V
Reverse Recovery Time	t _{rr}	I _F = 50 A, di/dt = 100 A/μs	-	69	-	ns
Reverse Recovery Charge	Q _{rr}		-	126	-	nC

Notes

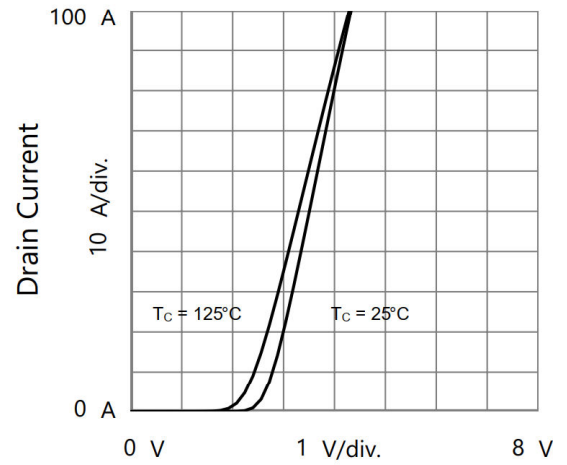
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.
 c. Independent of operating temperature.

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.

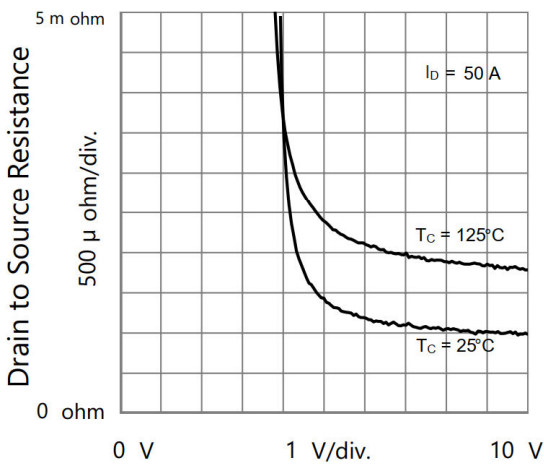
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



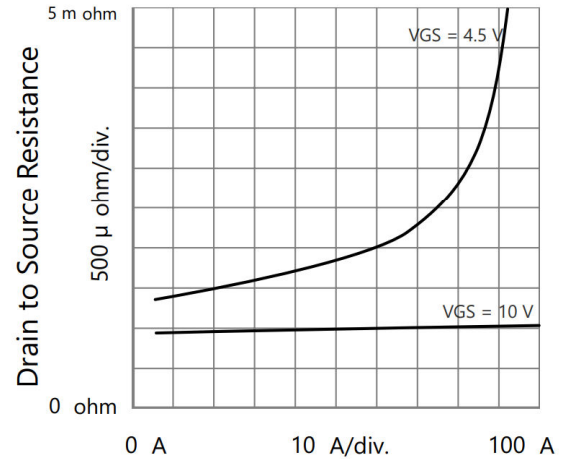
Drain to Source Voltage
Output Characteristics



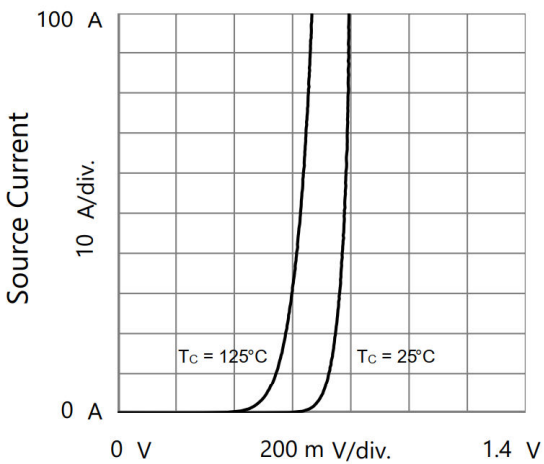
Gate to Source Voltage
Transfer Characteristics



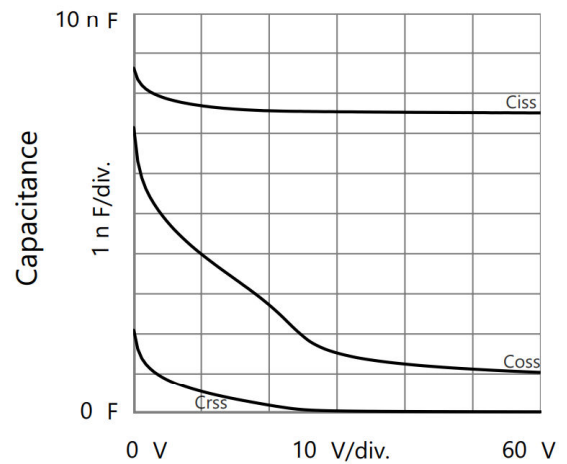
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

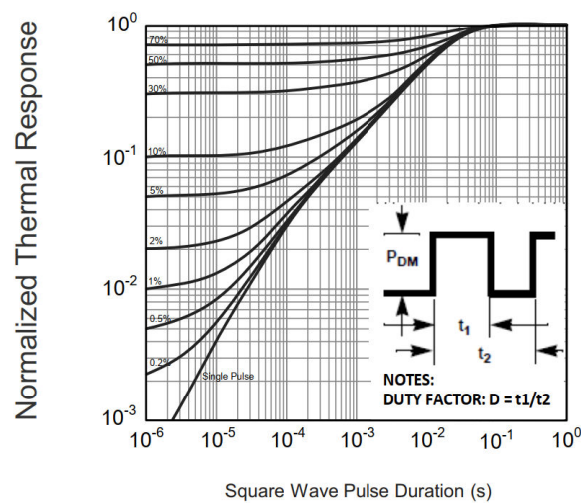
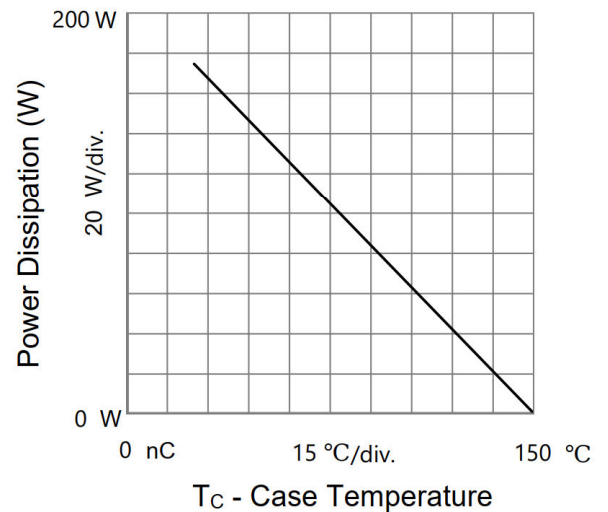
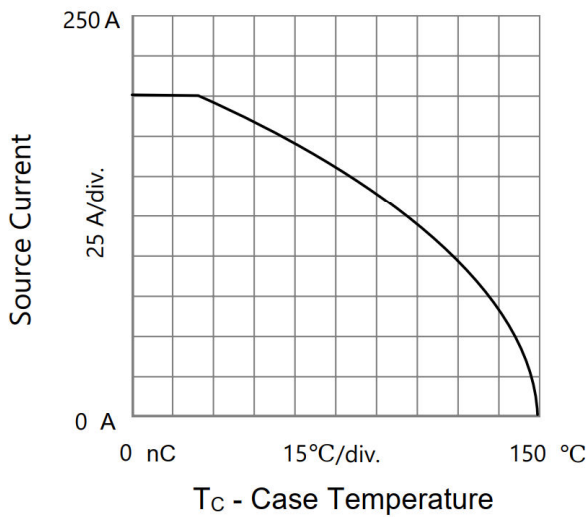
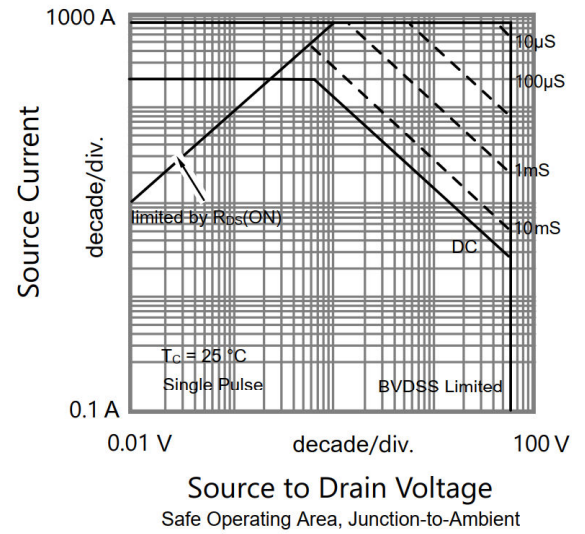
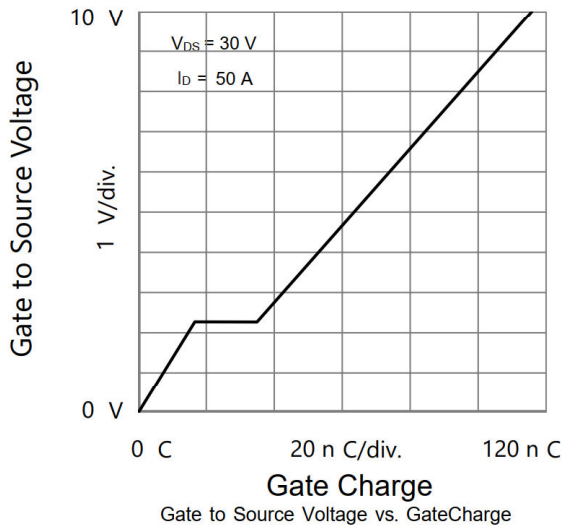


Source to Drain Voltage
Body Diode Forward Characteristics



Drain to Source Voltage
Capacitances

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance

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