

## Dual N-Channel 150 V (D-S) Super Junction MOSFET

PRODUCT SUMMARY			
$V_{DS}$ (V)	$R_{DS(on)}$ (m $\Omega$ )(Typ.)	$I_D$ (A) <sup>a</sup>	$Q_g$ (Typ.)
150	50 at $V_{GS} = 10$ V	12	8.5 nC

### FEATURES

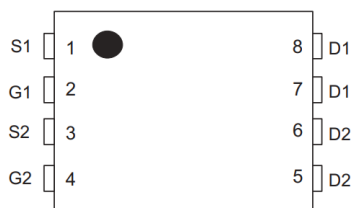
- DT-SJ Power MOSFET
- 100 %  $R_g$  and UIS tested
- Extremely Low  $Q_g$  for Switching Losses
- Compliant to RoHS Directive 2002/95/EC



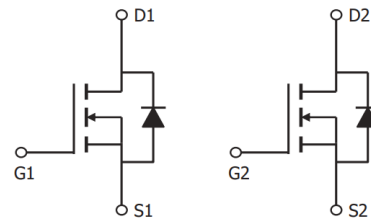
### APPLICATIONS

- Primary Side Switch

DFN5X6 Pin Configuration



Top View



N1-Channel MOSFET

N2-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_C = 25$ °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		$V_{DS}$	150	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current ( $T_J = 150$ °C)	$T_C = 25$ °C	$I_D$	12	A
	$T_C = 100$ °C		7.5	
Pulsed Drain Current ( $t = 100$ $\mu$ s)		$I_{DM}$	36	
Single Avalanche Energy <sup>a</sup>	$L = 0.5$ mH	$E_{AS}$	45	mJ
Maximum Power Dissipation	$T_C = 25$ °C	$P_D$	20 <sup>b,c</sup>	W
	$T_C = 100$ °C		8 <sup>b,c</sup>	
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) <sup>b,d</sup>	$t \leq 10$ s	$R_{thJA}$	60	°C/W
Junction-to-Case (Drain)	Steady State	$R_{thJC}$	6	

Notes:

- $T_C = 25$  °C.
- Surface mounted on 1" x 1" FR4 board.
- $t = 10$  s.
- Maximum under steady state conditions is 75 °C/W.

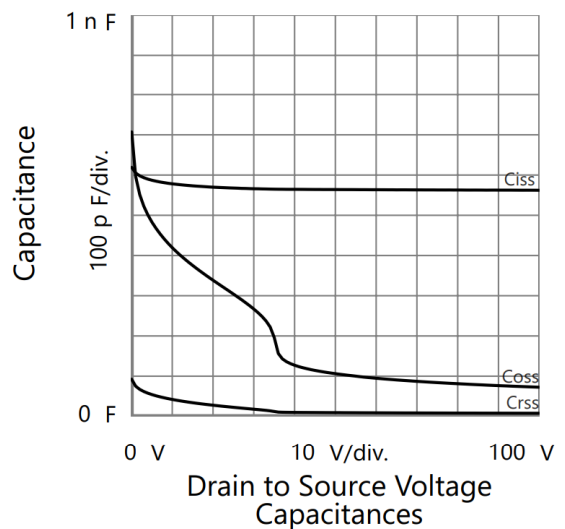
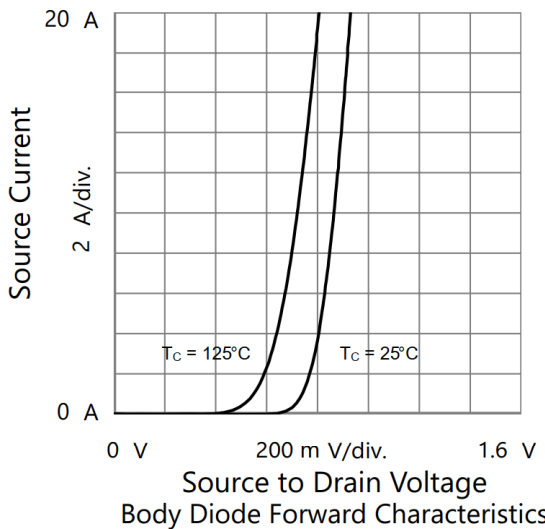
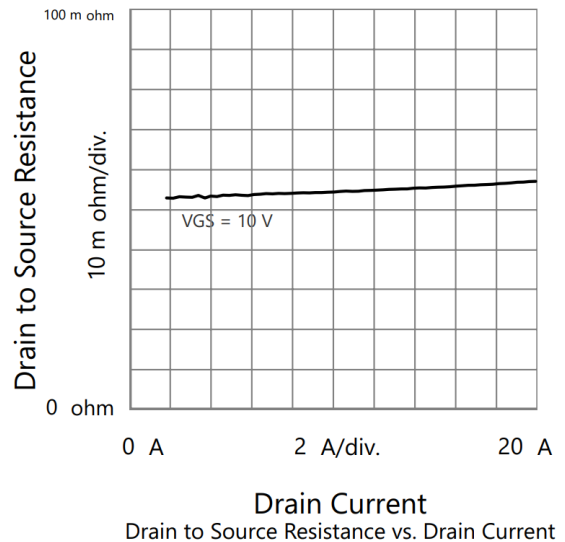
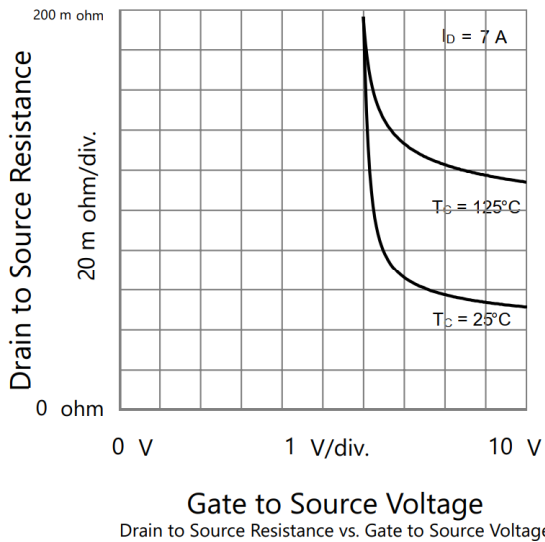
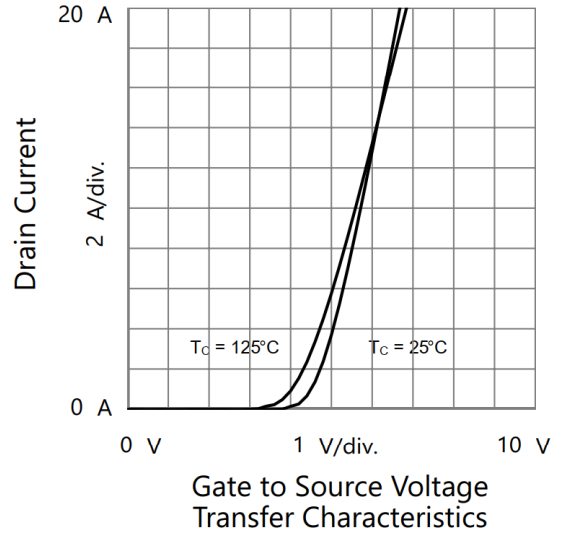
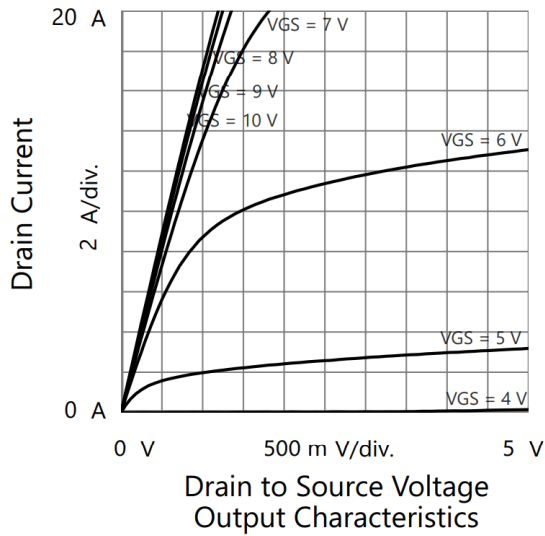
<b>SPECIFICATIONS</b> ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	150	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2	-	4	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 150\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	$\mu\text{A}$
		$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$	-	15	-	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = 10\text{ V}$	12	-	-	A
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 7\text{ A}$	-	50	60	m $\Omega$
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 5\text{ V}, I_D = 5\text{ A}$	-	13	-	S
<b>Dynamic <sup>b</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 50\text{ V}, f = 1\text{ MHz}$	-	564	-	pF
Output Capacitance	$C_{oss}$		-	106	-	
Reverse Transfer Capacitance	$C_{rss}$		-	9.3	-	
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = 50\text{ V}, V_{GS} = 10\text{ V}, I_D = 7\text{ A}$	-	8.5	-	nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$		-	1.8	-	
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$		-	2.2	-	
Gate Resistance	$R_g$	$f = 1\text{ MHz}$	-	4.5	-	$\Omega$
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = 50\text{ V}, I_D = 7\text{ A}, R_g = 5\text{ }\Omega$ $V_{GS} = 10\text{ V}$	-	5	-	ns
Rise Time <sup>c</sup>	$t_r$		-	3	-	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$		-	12	-	
Fall Time <sup>c</sup>	$t_f$		-	3	-	
<b>Drain-Source Body Diode Ratings and Characteristics <sup>b</sup></b> ( $T_C = 25\text{ }^\circ\text{C}$ )						
Continuous Source-Drain Diode Current	$I_S$	$T_C = 25\text{ }^\circ\text{C}$	-	-	12	A
Pulsed Current ( $t = 100\text{ }\mu\text{s}$ )	$I_{SM}$		-	-	36	A
Forward Voltage <sup>a</sup>	$V_{SD}$	$I_F = 7\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F = 7\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	-	16	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	45	-	nC

**Notes**

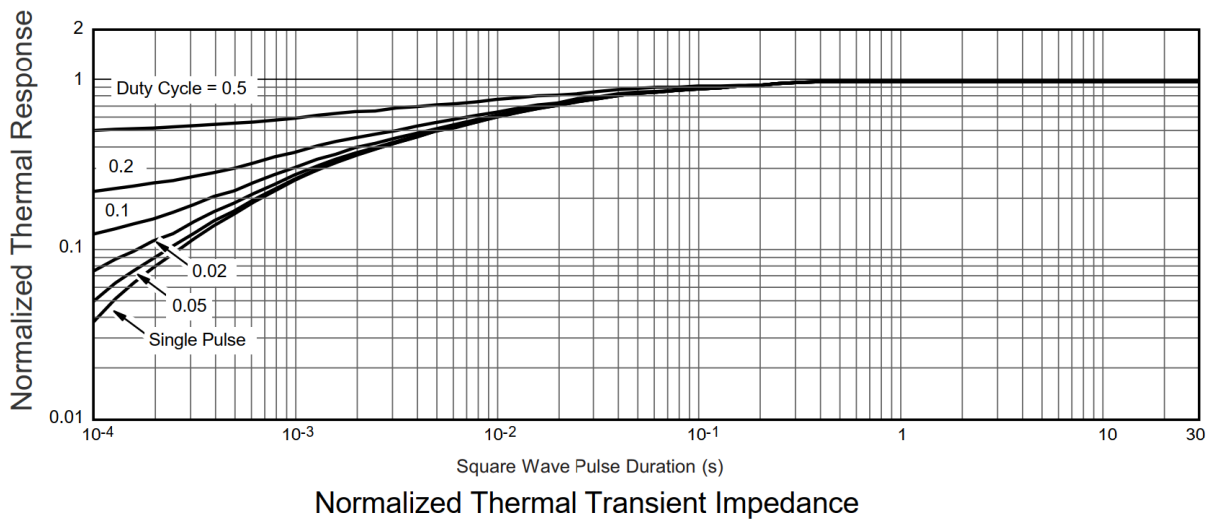
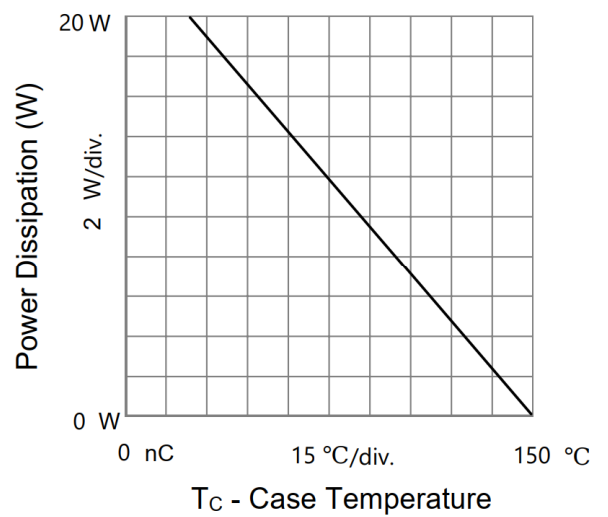
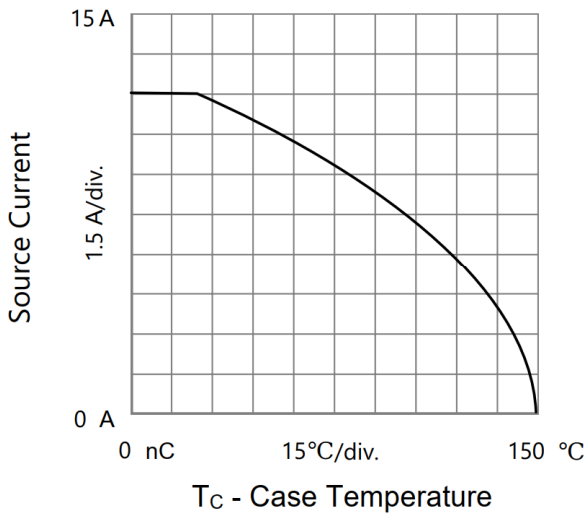
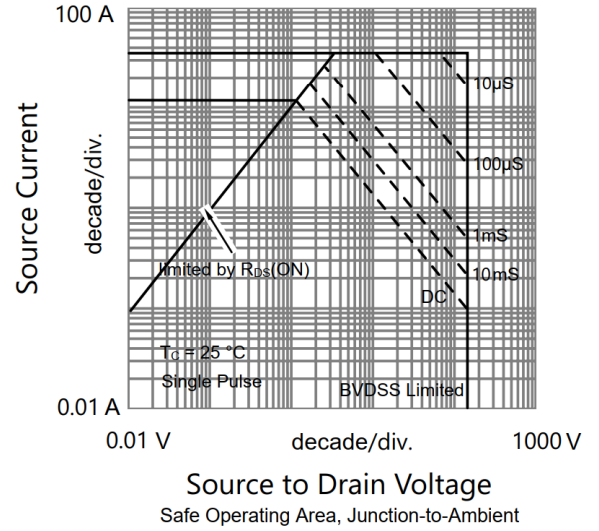
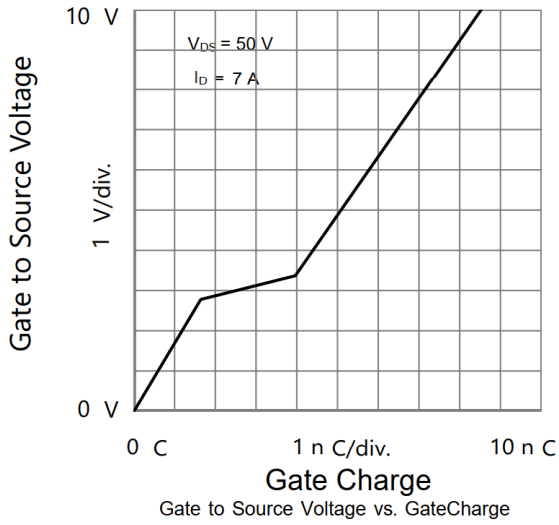
- a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .  
 b. Guaranteed by design, not subject to production testing.  
 c. Independent of operating temperature.

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.

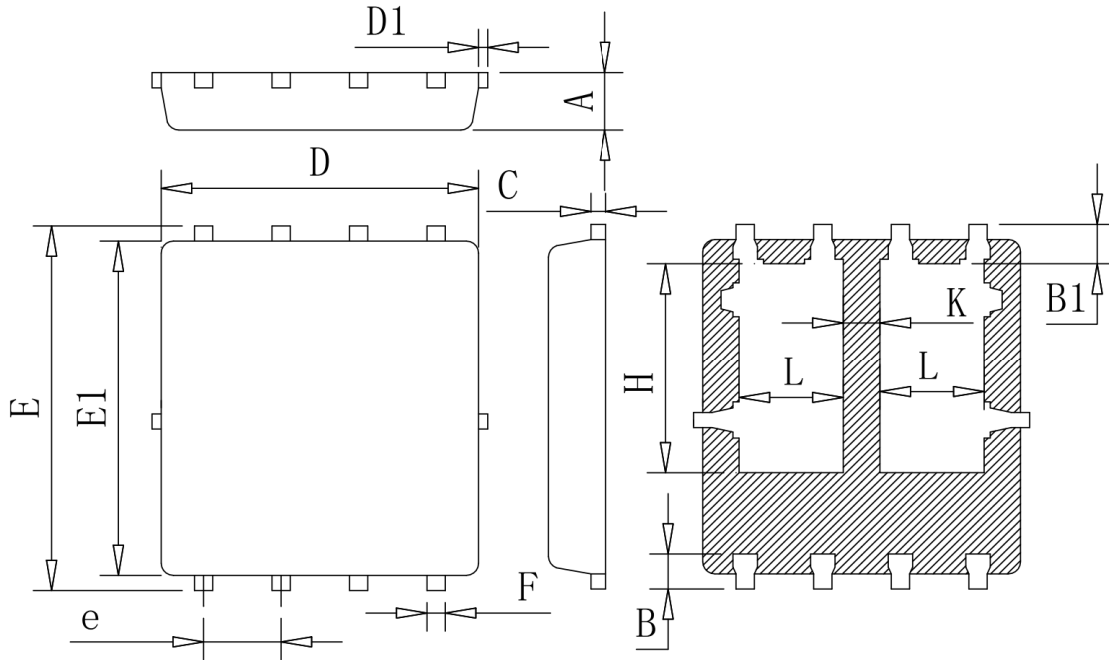
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



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**DFN5X6-8L-D PACKAGE OUTLINE**



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

Symbol	Min	Typ	Max
A	0.85	0.95	1.05
B	0.46	0.58	0.73
B1	0.52	0.65	0.78
C	0.18	0.254	0.32
D	4.70	5.20	5.50
D1	-	-	0.18
E	5.75	6.05	6.35
E1	5.35	5.65	5.85
e	1.15	1.27	1.50
F	0.15	0.30	0.50
H	3.15	3.47	3.80
L	1.35	1.70	2.10
K	0.35	0.60	1.00

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