

N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY

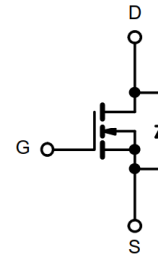
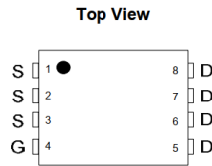
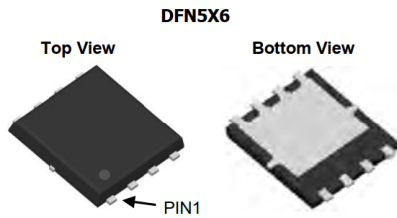
V_{DS} (V)	$R_{DS(on)}$ (m Ω)(Typ.)	I_D (A) ^{a, e}	Q_g (Typ.)
30	1.4 at $V_{GS} = 10$ V	135	137 nC
	2.0 at $V_{GS} = 4.5$ V		

FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested

APPLICATIONS

- OR-ing
- Server



N-Channel MOSFET

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C)	I_D	$T_C = 25$ °C	135 ^{a, e}
		$T_C = 70$ °C	110 ^e
		$T_A = 25$ °C	38 ^{b, c}
		$T_A = 70$ °C	32 ^{b, c}
Pulsed Drain Current	I_{DM}	390	A
Avalanche Current Pulse	I_{AS}	36	
Single Pulse Avalanche Energy		E_{AS}	
Continuous Source-Drain Diode Current	I_S	$T_C = 25$ °C	135 ^{a, e}
		$T_A = 25$ °C	9.3 ^{b, c}
Maximum Power Dissipation	P_D	$T_C = 25$ °C	312 ^a
		$T_C = 70$ °C	218
		$T_A = 25$ °C	4.25 ^{b, c}
		$T_A = 70$ °C	2.97 ^{b, c}
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, d}	R_{thJA}	30	35	°C/W
Maximum Junction-to-Case	R_{thJC}	0.4	0.48	

Notes:

- Based on $T_C = 25$ °C.
- Surface mounted on 1" x 1" FR4 board.
- $t = 10$ s.
- Maximum under steady state conditions is 90 °C/W.
- Calculated based on maximum junction temperature.

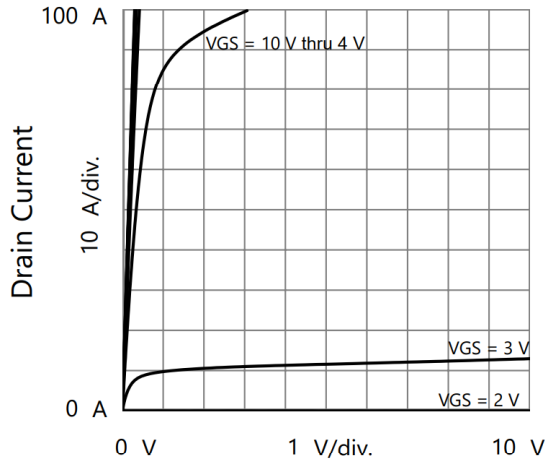
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)							
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	30			V	
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\text{ }\mu\text{A}$		35		mV/°C	
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 7.3			
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1		3	V	
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$			1	μA	
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			10		
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	135			A	
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 40\text{ A}$		1.4	1.8	m Ω	
		$V_{GS} = 4.5\text{ V}, I_D = 40\text{ A}$		2.0	2.5		
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 40\text{ A}$		160		S	
Dynamic^b							
Input Capacitance	C_{iss}	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		5900		μF	
Output Capacitance	C_{oss}			700			
Reverse Transfer Capacitance	C_{rss}			738			
Total Gate Charge	Q_g	$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 40\text{ A}$		137		nC	
Gate-Source Charge	Q_{gs}			12			
Gate-Drain Charge	Q_{gd}			28			
Gate Resistance	R_g	$f = 1\text{ MHz}$		1.5		Ω	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 0.555\text{ }\Omega$ $I_D \cong 40\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$		19		ns	
Rise Time	t_r			10			
Turn-Off Delay Time	$t_{d(off)}$			70			
Fall Time	t_f			10			
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 0.625\text{ }\Omega$ $I_D \cong 40\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 1\text{ }\Omega$		55			
Rise Time	t_r			180			
Turn-Off Delay Time	$t_{d(off)}$			55			
Fall Time	t_f			12			
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			135	A	
Pulse Diode Forward Current ^a	I_{SM}				390		
Body Diode Voltage	V_{SD}	$I_S = 1\text{ A}$			1	V	
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 40\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		60		ns	
Body Diode Reverse Recovery Charge	Q_{rr}				75		nC
Reverse Recovery Fall Time	t_a				30		ns
Reverse Recovery Rise Time	t_b				29		

Notes:

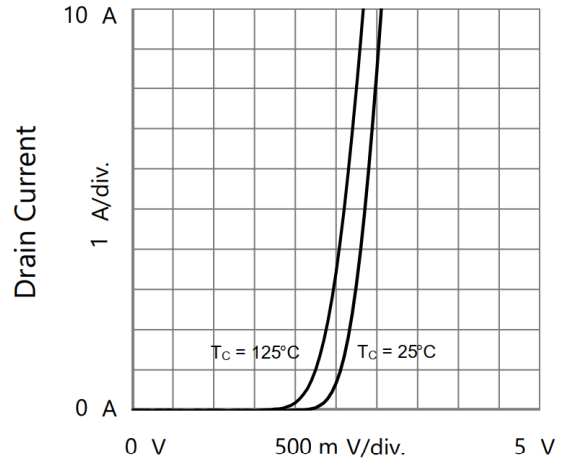
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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.

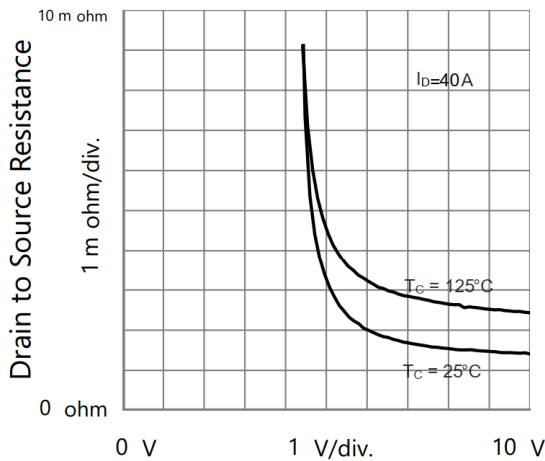
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



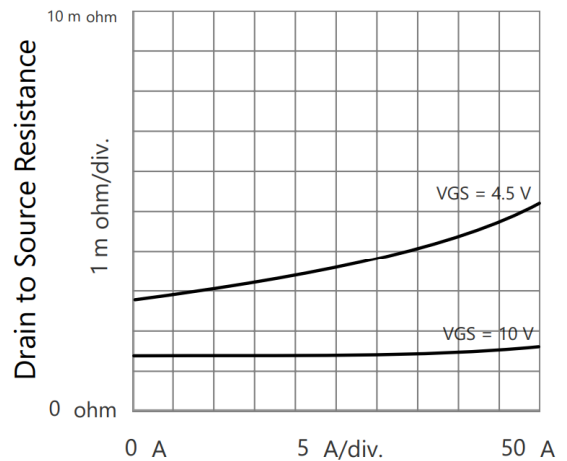
Drain to Source Voltage Output Characteristics



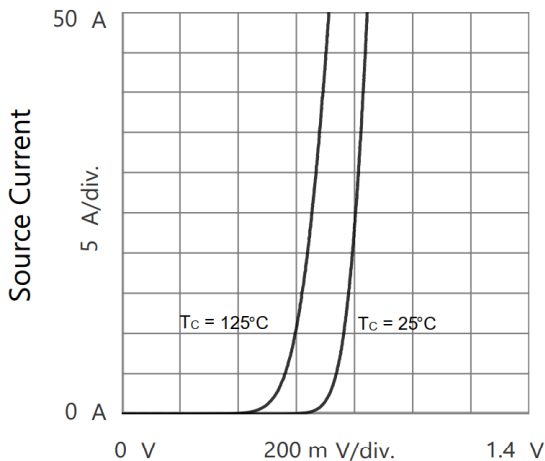
Gate to Source Voltage Transfer Characteristics



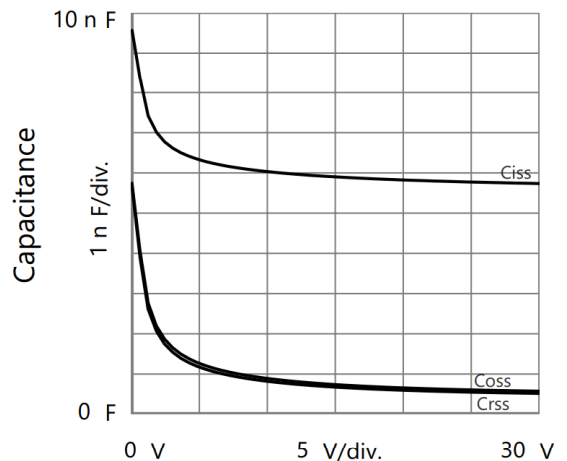
Gate to Source Voltage Drain to Source Resistance vs. Gate to Source Voltage



Drain Current Drain to Source Resistance vs. Drain Current

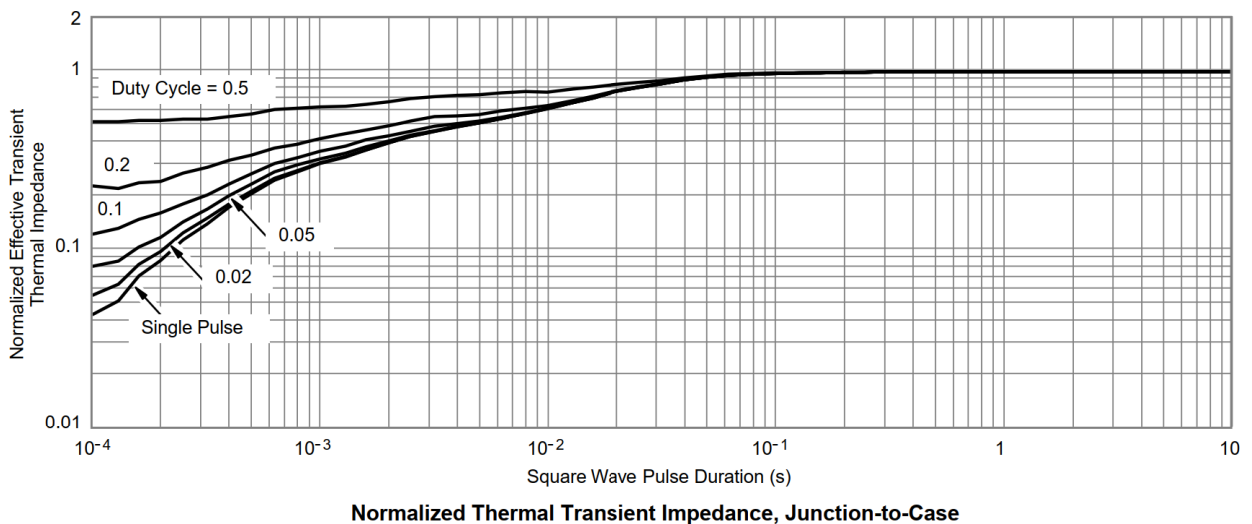
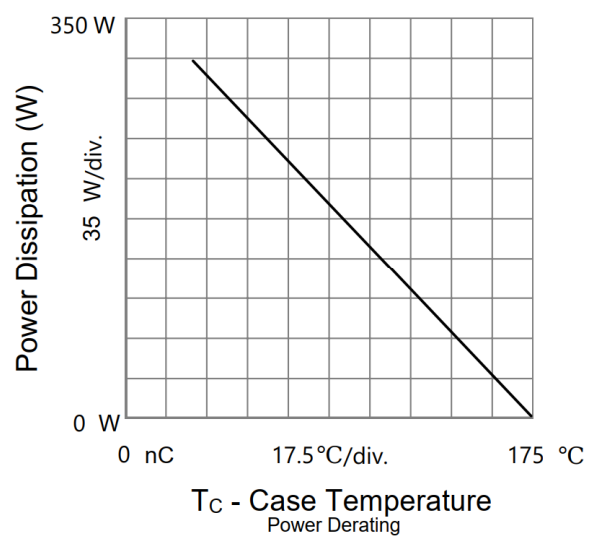
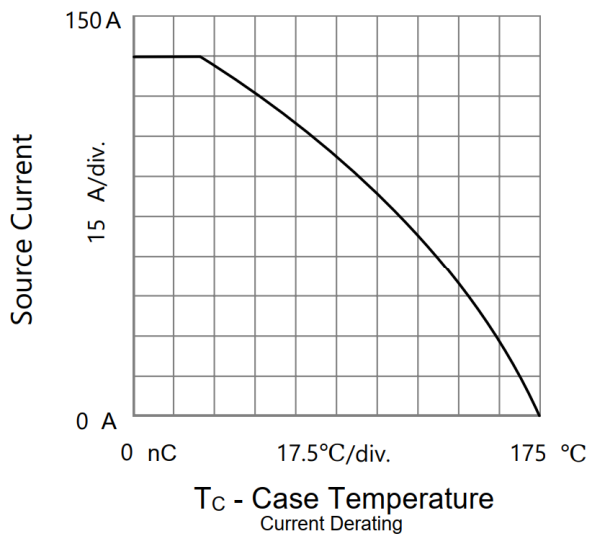
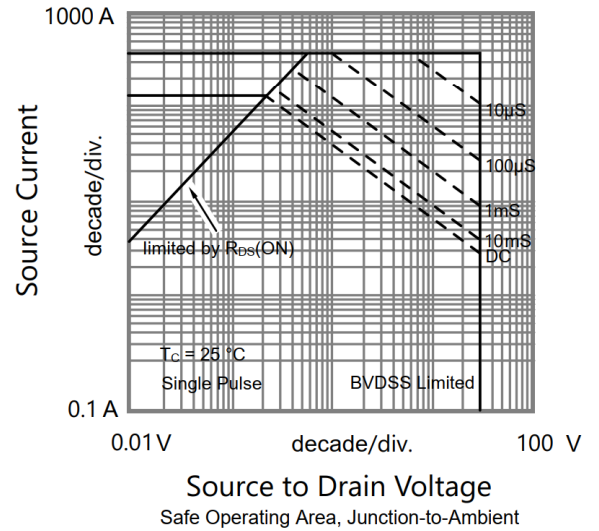
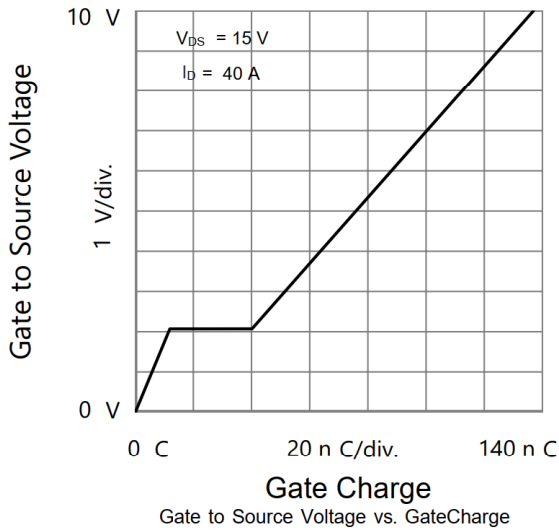


Source to Drain Voltage Body Diode Forward Characteristics

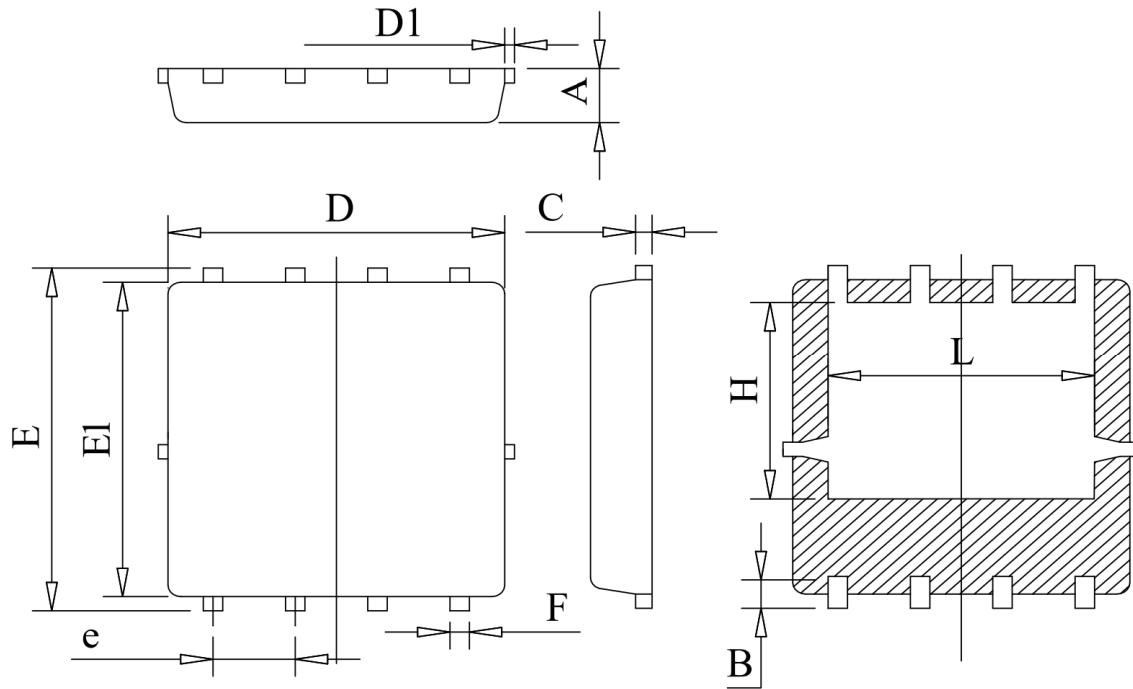


Drain to Source Voltage Capacitances

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



DFN5X6-8L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

Unit : mm

Symbol	Min	Typ	Max
A	0.78	0.95	1.12
B	0.45	0.58	0.78
C	0.18	0.254	0.36
D	4.70	5.20	5.45
D1			0.18
E	5.85	6.05	6.25
E1	5.38	5.55	5.98
e	1.15	1.27	1.40
F	0.18	0.30	0.52
H	3.25	3.47	3.70
L	3.75	4.00	4.25

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