

N-Channel 40 V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (mΩ)(Typ.)	I _D (A) ^{a, e}	Q _g (Typ.)
40	6.8 at V _{GS} = 10 V	52	38 nC
	11 at V _{GS} = 4.5 V		

FEATURES

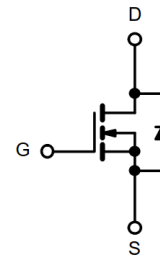
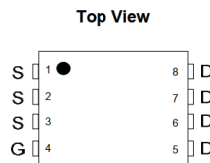
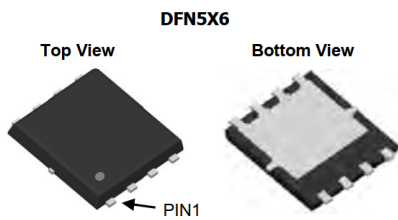
- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested



RoHS
COMPLIANT

APPLICATIONS

- Notebook PC Core
- VRM/POL



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)	T _C = 25 °C	I _D	52
	T _C = 100 °C	I _D	34
Pulsed Drain Current (t = 300 μs)	I _{DM}	205	A
Single Pulse Avalanche Energy	L = 0.5 mH E _{AS}	210	mJ
Maximum Power Dissipation	T _C = 25 °C	P _D	50
	T _C = 100 °C		20
	T _A = 25 °C		3.3 ^{b, c}
	T _A = 100 °C		1.3 ^{b, c}
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature) ^{d, e}		260	

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, f}	R _{thJA}	-	38	°C/W
Maximum Junction-to-Case (Drain)	R _{thJC}	-	2.5	

Notes:

- Based on T_C = 25 °C.
- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- The DFN5X6 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.
- Rework conditions: manual soldering with a soldering iron is not recommended for leadless components.
- Maximum under steady state conditions is 70 °C/W.

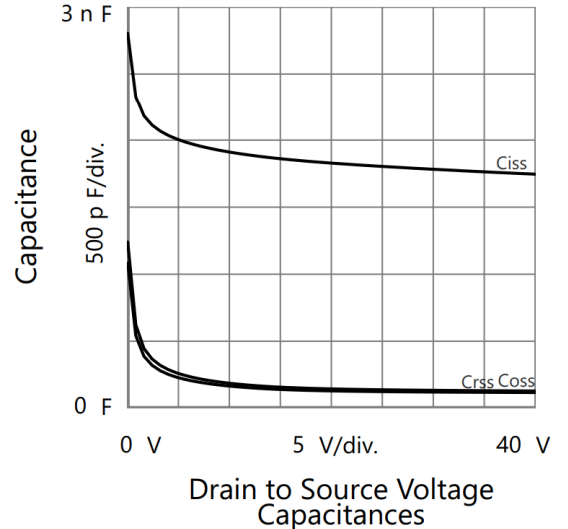
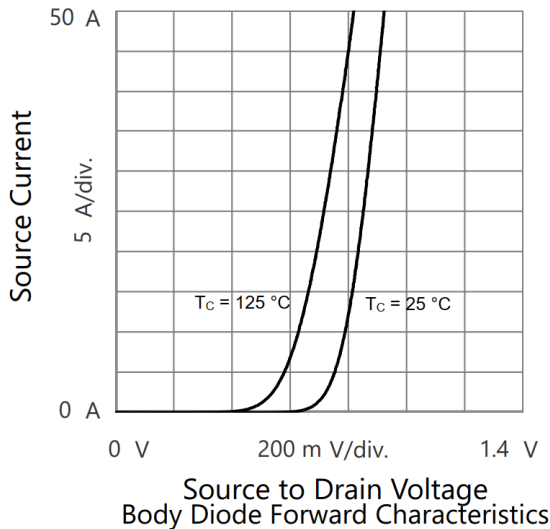
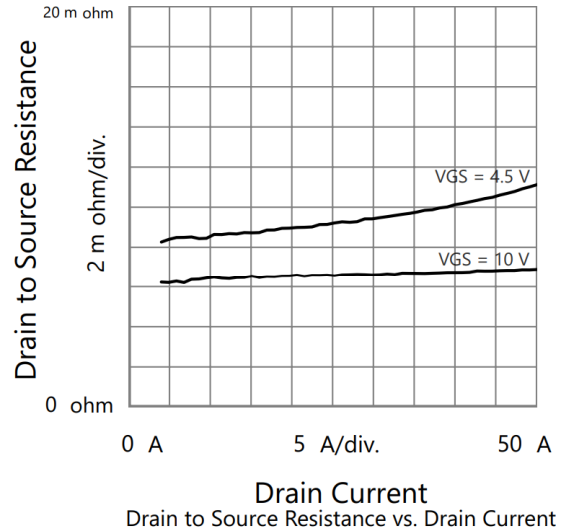
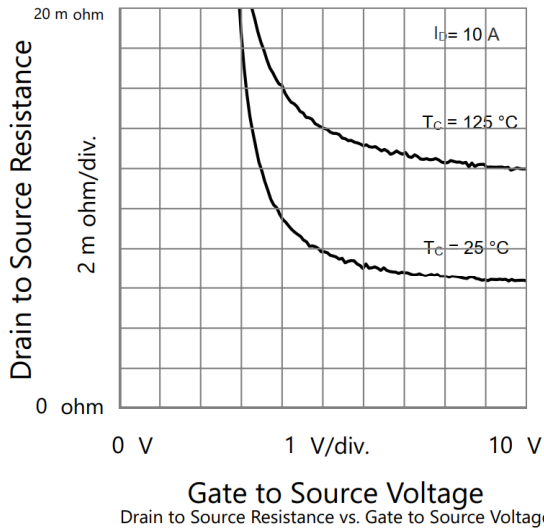
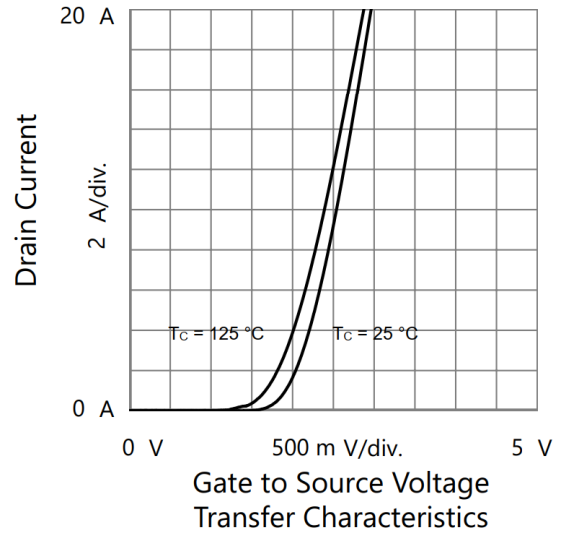
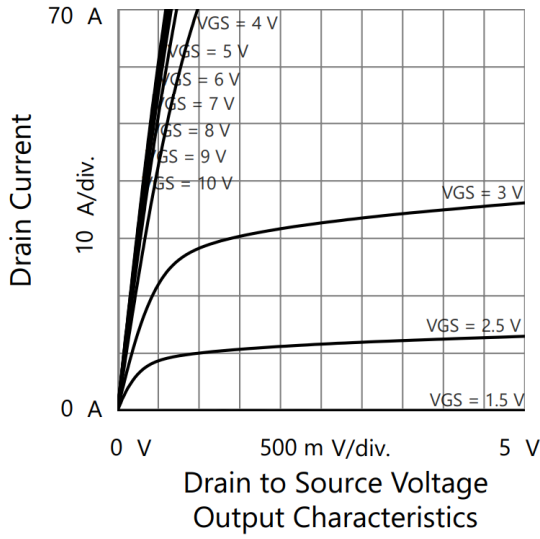
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	40	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1	-	3	
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}	$V_{DS} = 40\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	μA
		$V_{DS} = 32\text{ V}, V_{GS} = 0\text{ V}, T_J = 85\text{ }^\circ\text{C}$	-	-	10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = 10\text{ V}$	52	-	-	A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 10\text{ A}$	-	6.8	9.2	m Ω
		$V_{GS} = 10\text{ V}, I_D = 10\text{ A}$	-	11	15	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 10\text{ A}$	-	55	-	S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 20\text{ V}, f = 1\text{ MHz}$	-	1830	-	pF
Output Capacitance	C_{oss}		-	145	-	
Reverse Transfer Capacitance	C_{rss}		-	130	-	
Total Gate Charge ^c	Q_g	$V_{DS} = 20\text{ V}, V_{GS} = 10\text{ V}, I_D = 10\text{ A}$	-	38	-	nC
Gate-Source Charge ^c	Q_{gs}		-	2.56	-	
Gate-Drain Charge ^c	Q_{gd}		-	5.9	-	
Gate Resistance	R_g	$f = 1\text{ MHz}$	-	1.5	-	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 20\text{ V}, R_g = 3\text{ }\Omega$ $I_D = 10\text{ A}, V_{GEN} = 10\text{ V},$	-	25	-	ns
Rise Time ^c	t_r		-	12	-	
Turn-Off Delay Time ^c	$t_{d(off)}$		-	66	-	
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	$T_C = 25\text{ }^\circ\text{C}$	-	-	52	A
Pulsed Source Current	I_{SM}		-	-	205	A
Forward Voltage ^a	V_{SD}	$I_F = 1\text{ A}, V_{GS} = 0\text{ V}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	-	50	-	ns
Reverse Recovery Charge	Q_{rr}		-	75	-	nC

Notes

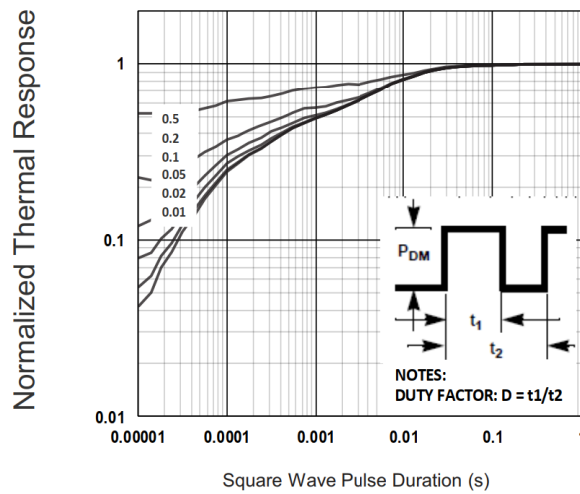
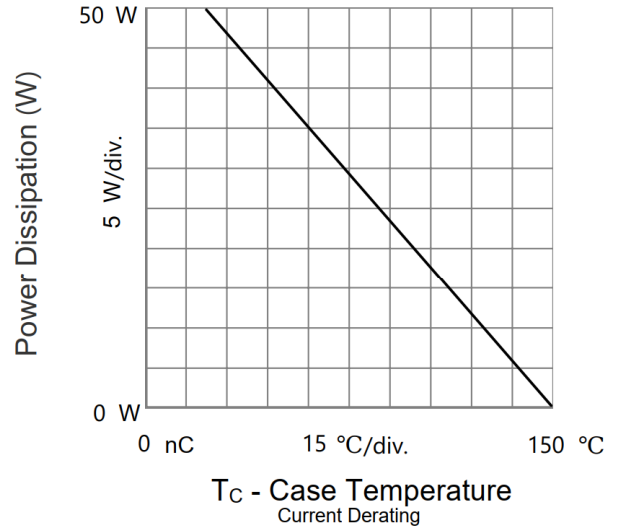
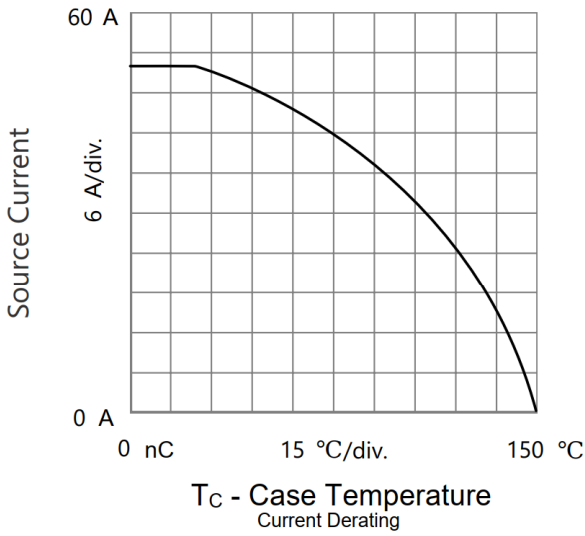
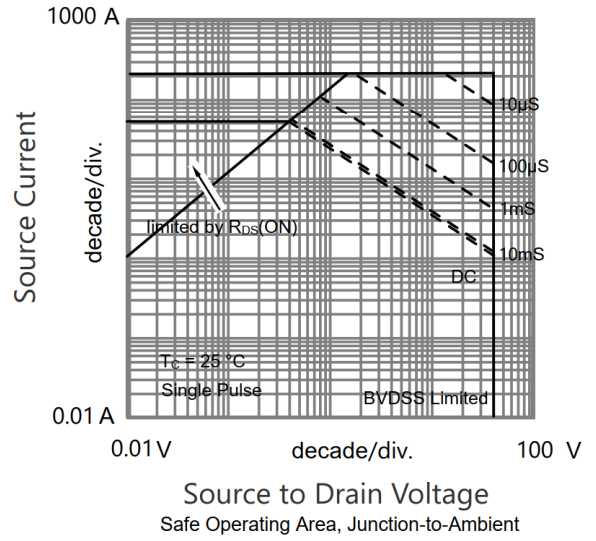
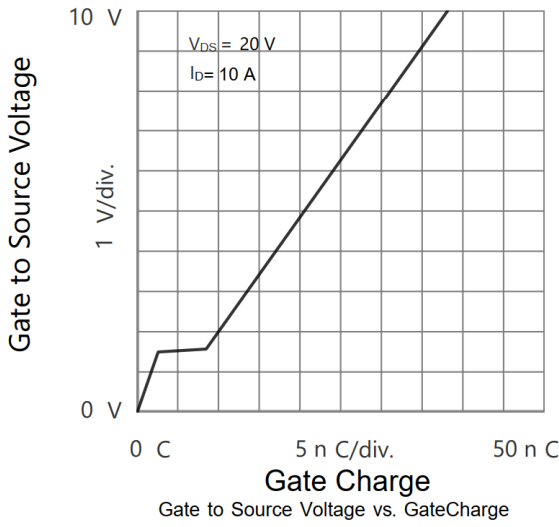
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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

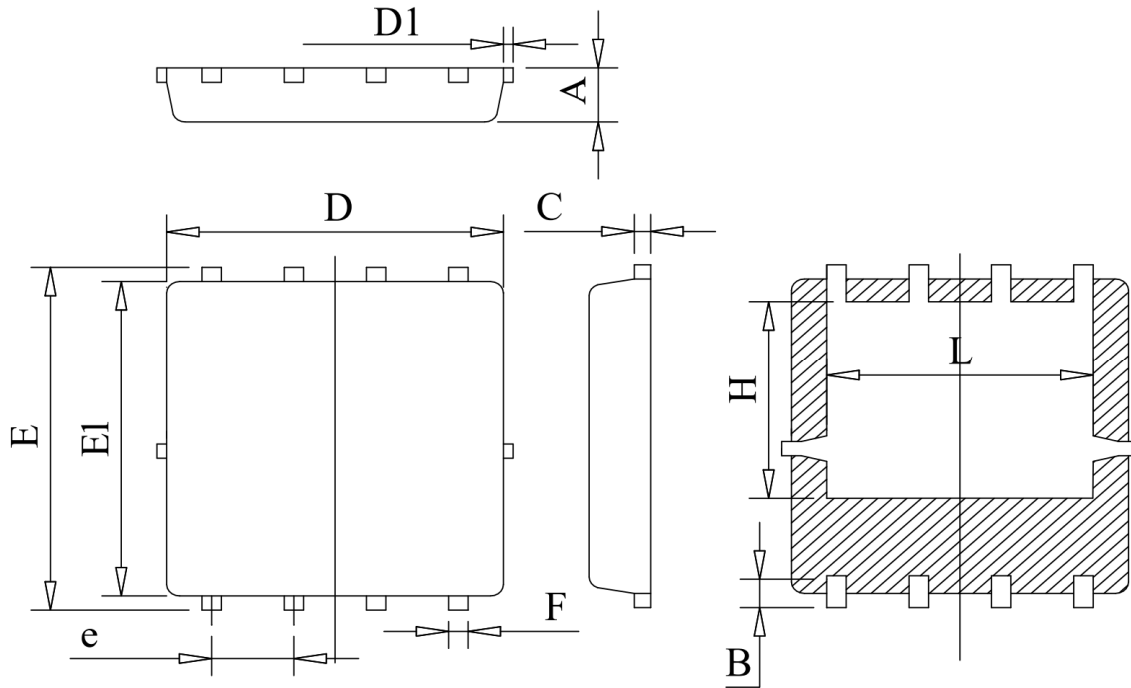


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient

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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