

N-Channel 40 V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (mΩ)(Typ.)	I _D (A) ^a	Q _g (Typ.)
40	2 at V _{GS} = 10 V	110	120 nC
	3.5 at V _{GS} = 4.5 V		

FEATURES

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

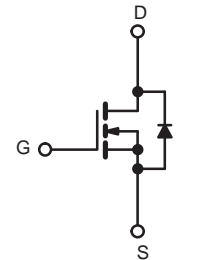
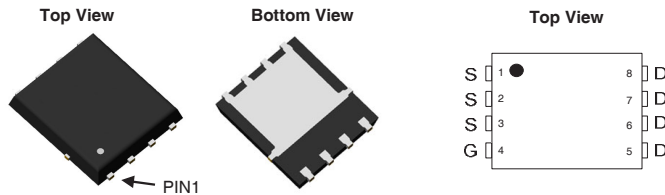


RoHS
COMPLIANT

APPLICATIONS

- DC/DC Converter
- VRM/POL

DFN5X6-8L Pin Configuration



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C = 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 = 175 °C)	I _D	T _C = 25 °C	110
		T _C = 100 °C	47.5
Pulsed Drain Current	I _{DM}	400	A
Single Avalanche Energy ^a	E _{AS}	485	mJ
Maximum Power Dissipation	P _D	T _C = 25 °C	75 ^{b,c}
		T _C = 100 °C	36 ^{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}	R _{thJA}	17	°C/W
Junction-to-Case (Drain)	R _{thJC}	1.66	

Notes:

- T_C = 25 °C.
- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under steady state conditions is 20 °C/W.

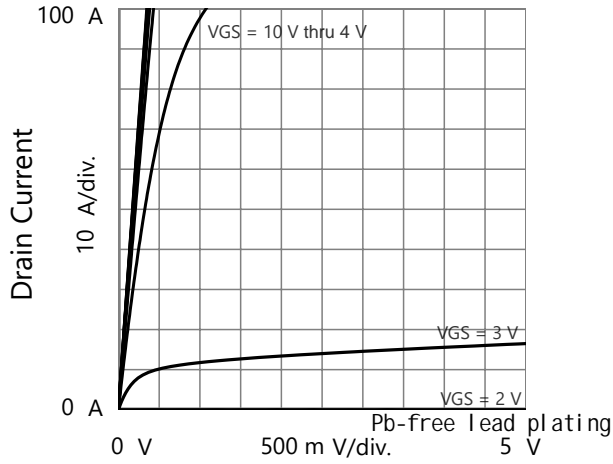
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0, I_D = 250\text{ }\mu\text{A}$	40			V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	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}	$V_{DS} = 40\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 32\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	110			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 30\text{ A}$		2	2.5	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 30\text{ A}$		3.5	4	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 30\text{ A}$		55		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		6480		pF
Output Capacitance	C_{oss}			470		
Reverse Transfer Capacitance	C_{rss}			445		
Total Gate Charge	Q_g	$V_{DS} = 20\text{ V}, V_{GS} = 10\text{ V}, I_D = 30\text{ A}$		120		nC
Gate-Source Charge	Q_{gs}			12.5		
Gate-Drain Charge	Q_{gd}			20		
Gate Resistance	R_g	$f = 1\text{ MHz}$		0.8		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 20\text{ V}, R_L = 1\text{ }\Omega$ $I_D \cong 30\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1.6\text{ }\Omega$		8		ns
Rise Time	t_r			3		
Turn-Off Delay Time	$t_{d(off)}$			28		
Fall Time	t_f			4		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			110	A
Pulse Diode Forward Current (100 μs)	I_{SM}				400	
Body Diode Voltage	V_{SD}	$I_S = 1\text{ A}$			1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 30\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		20		ns
Body Diode Reverse Recovery Charge	Q_{rr}				59	

Notes:

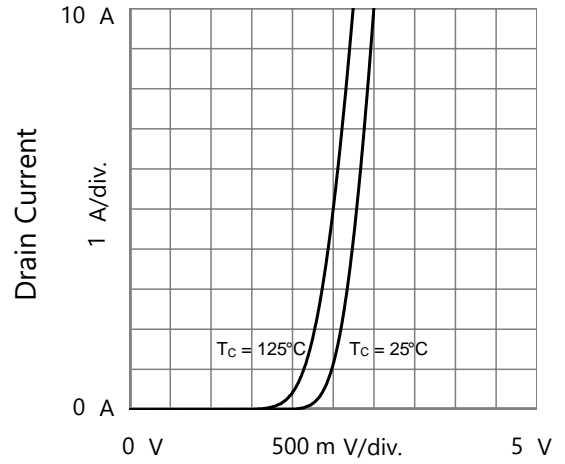
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

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.

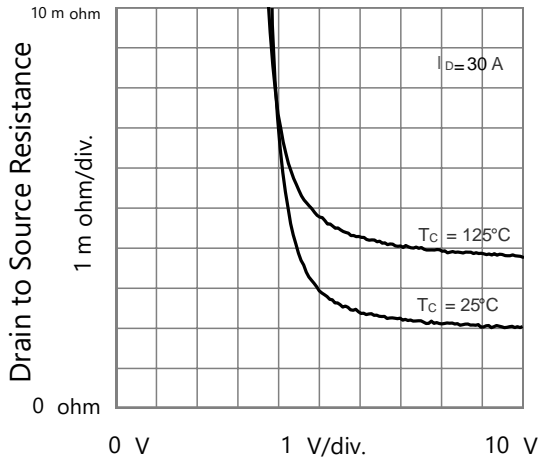
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



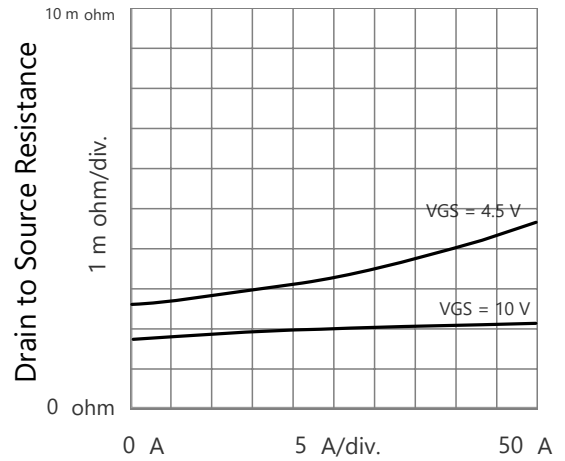
Drain to Source Voltage
Output Characteristics



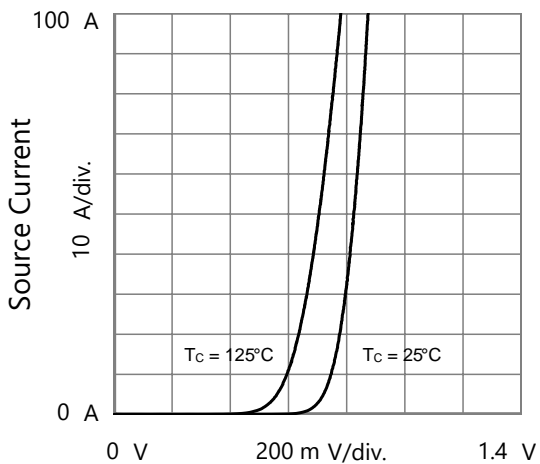
Gate to Source Voltage
Transfer Characteristics



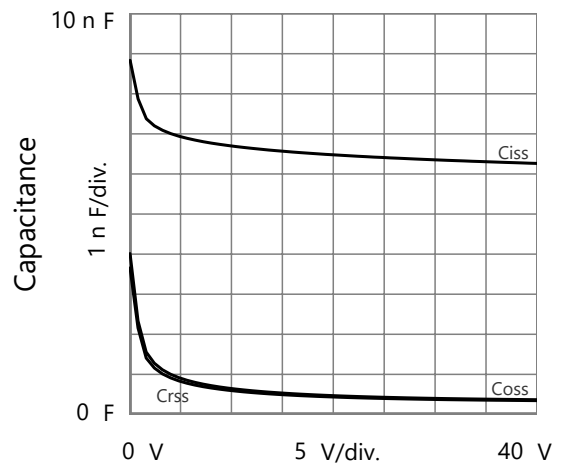
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

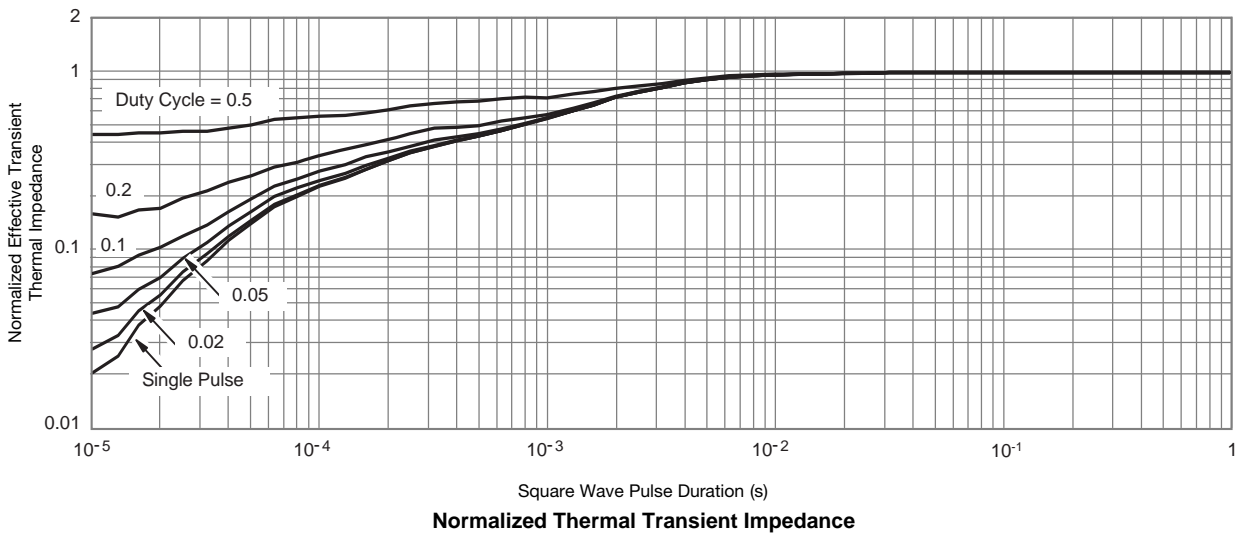
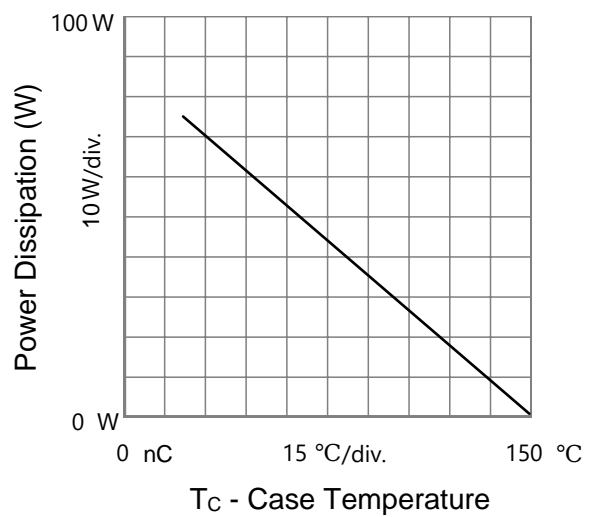
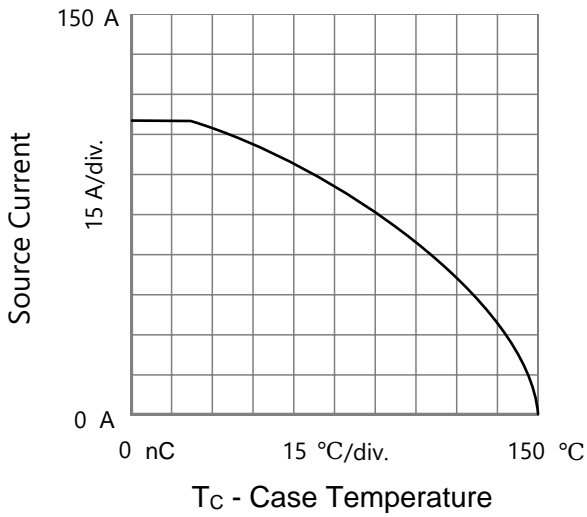
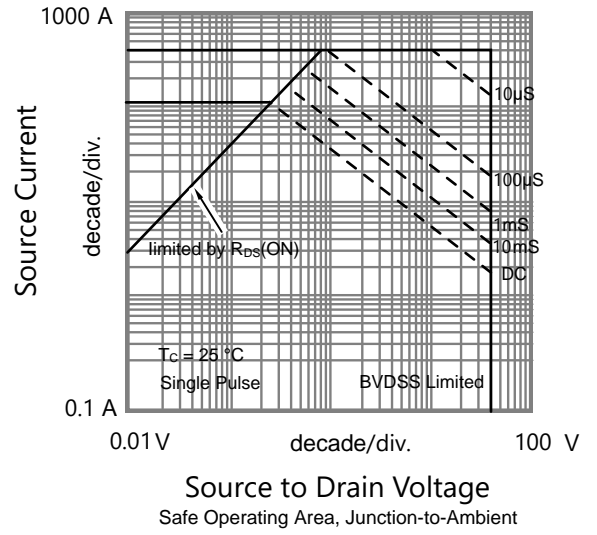
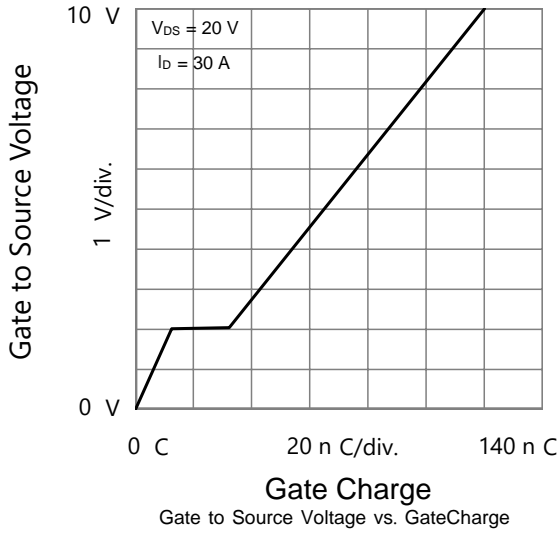


Source to Drain Voltage
Body Diode Forward Characteristics



Drain to Source Voltage
Capacitances

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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