

P-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)(Typ.)	I_D (A) ^a	Q_g (Typ.)
- 60	7.5 at $V_{GS} = - 10$ V	- 90	78 nC
	9.5 at $V_{GS} = - 4.5$ V		

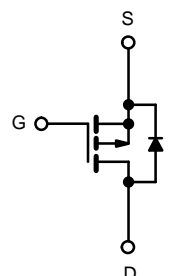
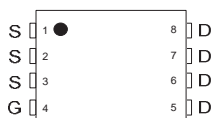
FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested
- RoHS Compliant
- Low $R_{DS(ON)}$
- High Current Capability

APPLICATIONS

- General Automotive Applications
- Battery protection charge/discharge

DFN5X6-8L Pin Configuration



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	- 60	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	- 90	A
		- 62	
Pulsed Drain Current ^b	I_{DM}	- 360	
Single Pulse Avalanche Current	I_{AS}	- 55	
Single Pulse Avalanche Energy	E_{AS}	742	mJ
Maximum Power Dissipation ^c	P_D	149	W
		60	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to +150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^d	R_{thJA}	40	$^\circ\text{C/W}$
Junction-to-Case (Drain)	R_{thJC}	0.83	

Notes

- Calculated continuous current based on maximum allowable junction temperature.
- Repetitive rating; pulse width limited by max. junction temperature.
- P_D is based on max. junction temperature, using junction-case thermal resistance.
- The value of R_{thJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a = 25^\circ\text{C}$.

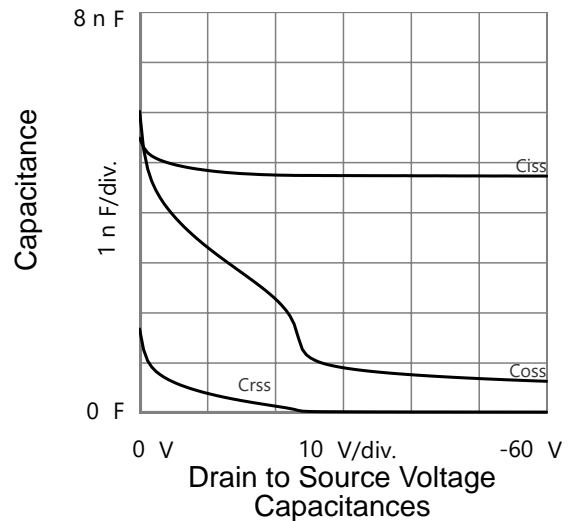
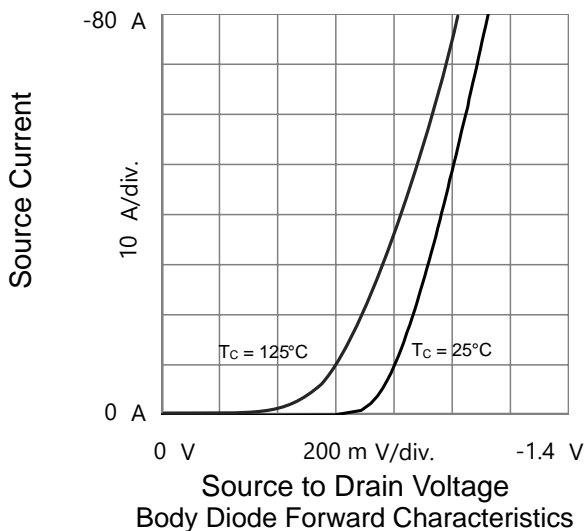
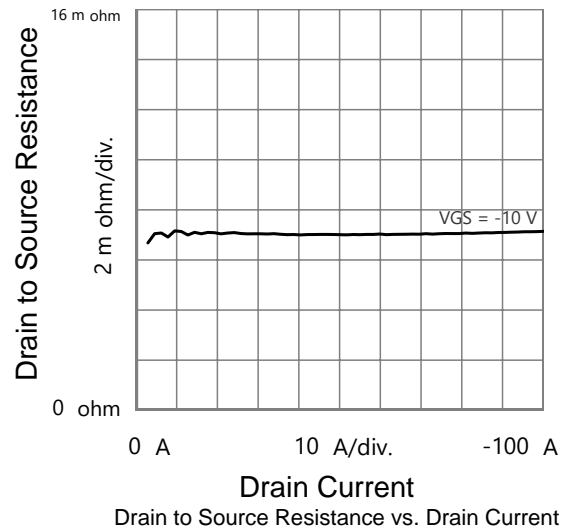
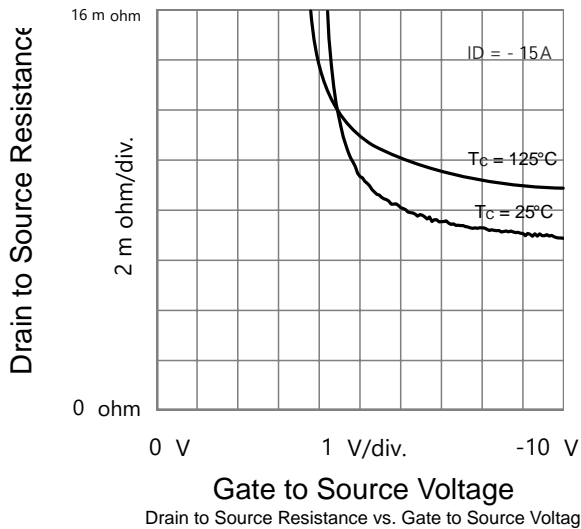
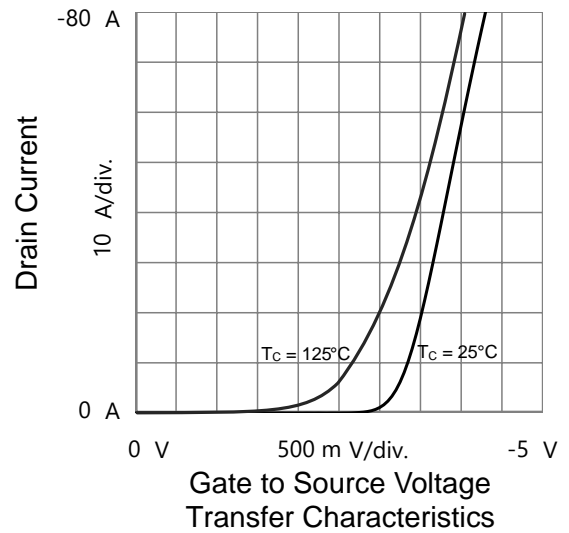
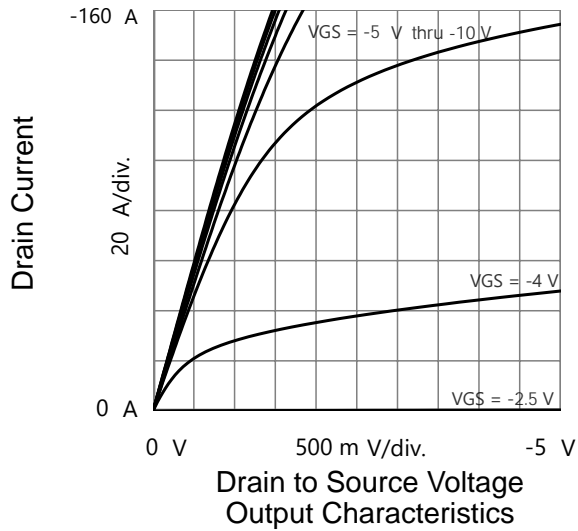
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 60	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1	-	- 3	
Gate-Body Leakage	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 = 55 °C	-	-	- 50	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ - 5 V, V _{GS} = - 10 V	- 90	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 15 A	-	7.5	9.2	mΩ
		V _{GS} = - 4.5 V, I _D = - 15 A	-	9.5	14	
Forward Transconductance ^a	g _{fs}	V _{DS} = - 5 V, I _D = - 15 A	-	80	-	S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = - 30 V, f = 1 MHz	-	4740	-	pF
Output Capacitance	C _{oss}		-	907	-	
Reverse Transfer Capacitance	C _{rss}	V _{GS} = 0 V, V _{DS} = - 30 V, f = 100 kHz	-	26.6	-	
Total Gate Charge ^c	Q _g	V _{DS} = - 30 V, V _{GS} = - 10 V, I _D = - 6 A	-	78	-	nC
Gate-Source Charge ^c	Q _{gs}		-	13	-	
Gate-Drain Charge ^c	Q _{gd}		-	12	-	
Gate Resistance	R _g	f = 1 MHz	-	9	-	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = - 30 V, R _g = 5 Ω, R _L = 5 Ω I _D = - 6 A ,V _{GS} = - 10 V	-	12.7	-	ns
Rise Time ^c	t _r		-	16.8	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	184	-	
Fall Time ^c	t _f		-	86	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T _C = 25 °C)						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	-	-	- 90	A
Pulsed Current	I _{SM}		-	-	- 360	A
Forward Voltage ^a	V _{SD}	I _F = - 1 A, V _{GS} = 0 V	-	- 0.6	-	V
Reverse Recovery Time	t _{rr}	I _F = - 15 A, di/dt = 100 A/μs	-	35	-	ns
Body diode reverse recovery charge	Q _{rr}		-	120	-	nC

Notes

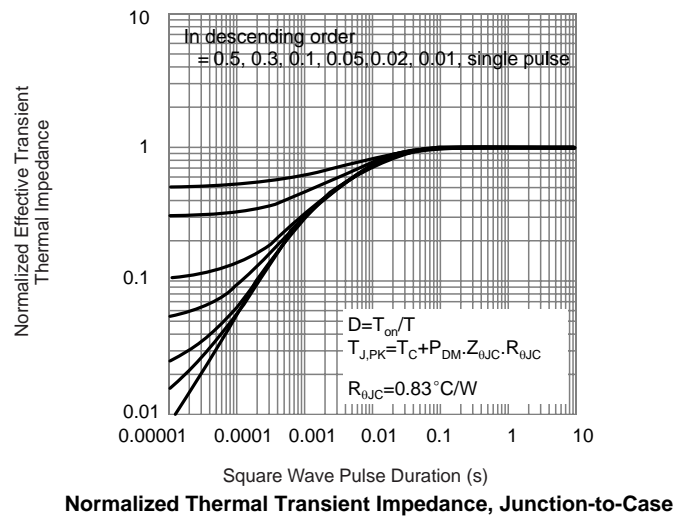
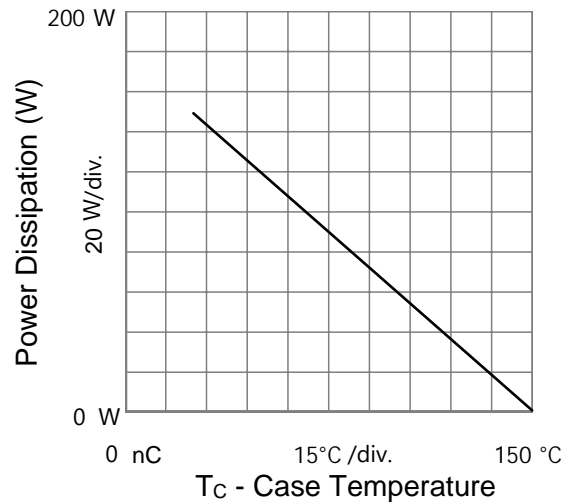
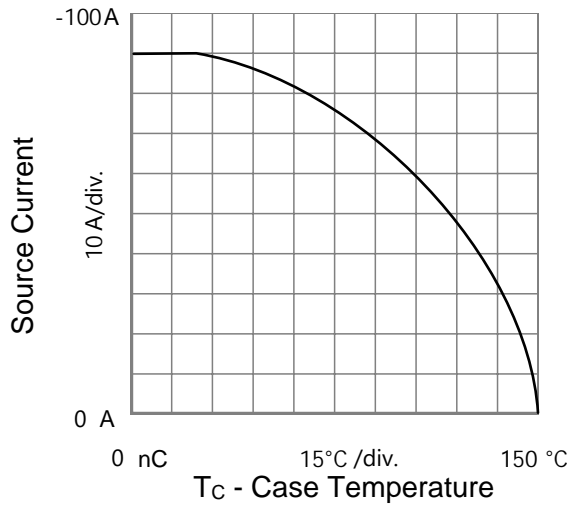
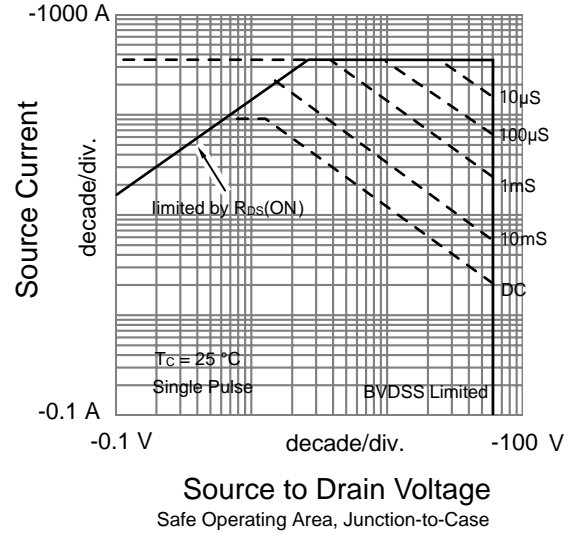
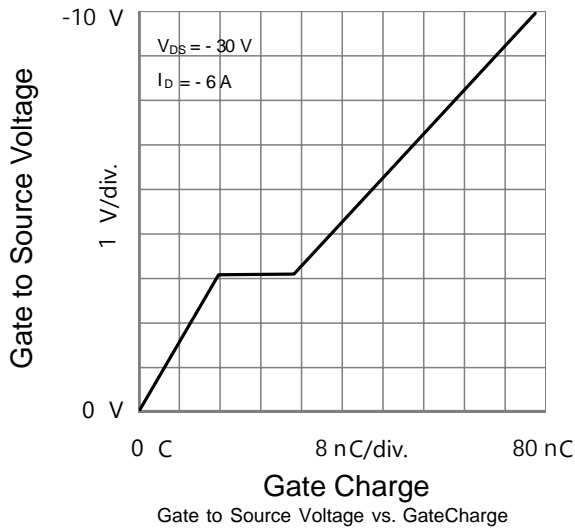
- Pulse test; pulse width $\leq 200\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

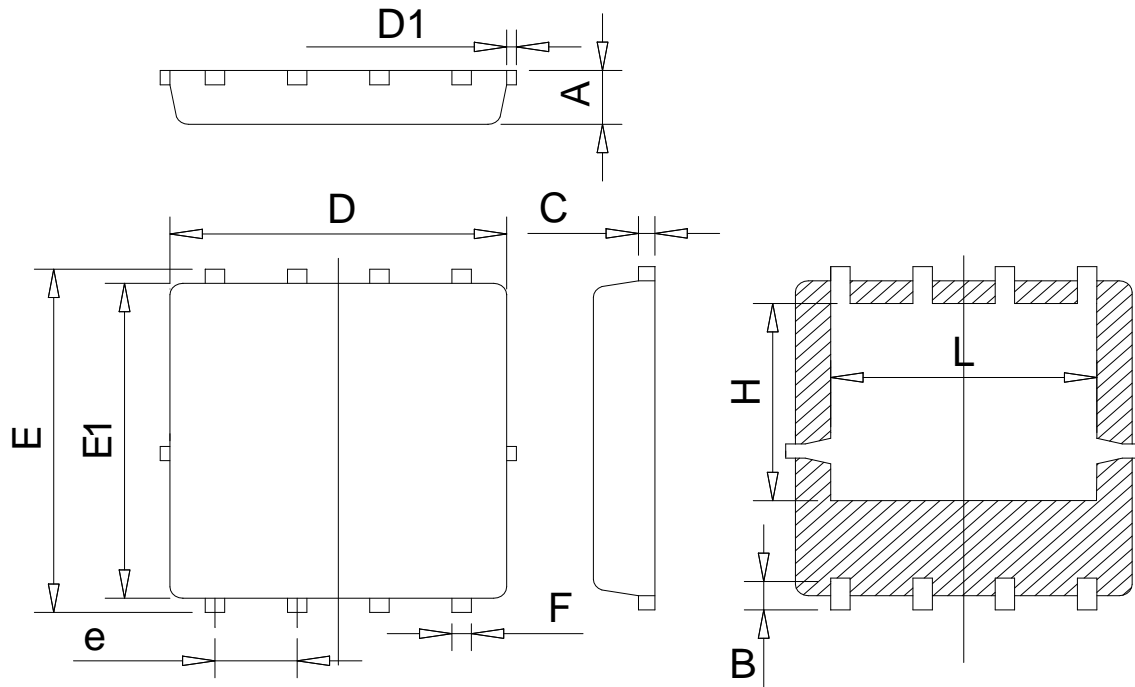
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



DFN5X6-8L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

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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