

## P-Channel 60-V (D-S) MOSFET

PRODUCT SUMMARY			
V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (mΩ)(Typ.)	I <sub>D</sub> (A) <sup>a</sup>	Q <sub>g</sub> (Typ.)
- 60	7 at V <sub>GS</sub> = - 10 V	- 85	76 nC
	8.5 at V <sub>GS</sub> = - 4.5 V		

### FEATURES

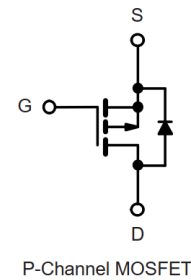
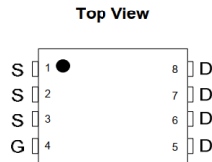
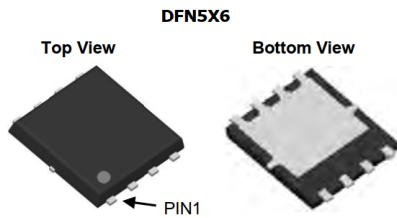
- DT-Trench Power MOSFET
- 100 % R<sub>g</sub> and UIS Tested

### APPLICATIONS

- PWM Applications
- Load Switch
- Power Management



RoHS  
COMPLIANT



ABSOLUTE MAXIMUM RATINGS (T <sub>C</sub> = 25 °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V <sub>DS</sub>	- 60	V
Gate-Source Voltage		V <sub>GS</sub>	± 20	
Continuous Drain Current	T <sub>C</sub> = 25 °C	I <sub>D</sub>	- 85	A
	T <sub>C</sub> = 100 °C		- 54	
Continuous Source Current (Diode Conduction)		I <sub>S</sub>	- 85	
Pulsed Drain Current <sup>a</sup>		I <sub>DM</sub>	- 340	
Single Pulse Avalanche Current	L = 0.1 mH	I <sub>AS</sub>	- 80	
Single Pulse Avalanche Energy		E <sub>AS</sub>	230	
Maximum Power Dissipation <sup>b</sup>	T <sub>C</sub> = 25 °C	P <sub>D</sub>	120	W
	T <sub>C</sub> = 100 °C		48	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	- 55 to + 150	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Case (Drain) <sup>c,d</sup>	R <sub>thJC</sub>	1.04	°C/W

#### Notes:

- Based on T<sub>C</sub> = 25°C.
- Pulse test; pulse width 300 μs, duty cycle 2 %.
- When mounted on 1" square PCB (FR-4 material).
- Parametric verification ongoing.

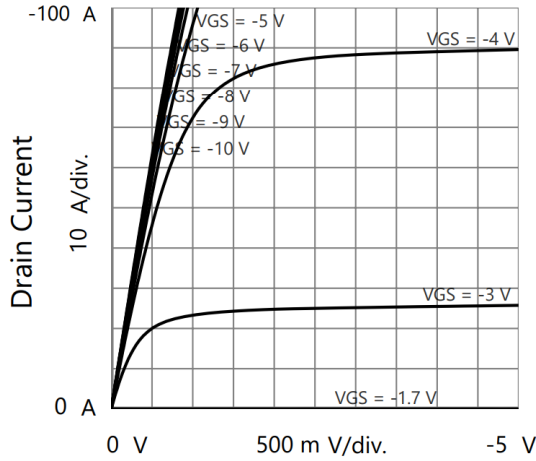
<b>SPECIFICATIONS</b> ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min .	Typ.	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 60			V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$			1	V
Gate-Source Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			1	
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -20\text{ A}$		7	8	m $\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -20\text{ A}$		8.5	10	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -10\text{ V}, I_D = -20\text{ A}$		60		S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		12300		pF
Output Capacitance	$C_{oss}$			485		
Reverse Transfer Capacitance	$C_{rss}$			604		
Total Gate Charge	$Q_g$	$V_{DS} = -10\text{ V}, V_{GS} = -30\text{ V}, I_D = -20\text{ A}$		76		nC
Gate-Source Charge	$Q_{gs}$			10		
Gate-Drain Charge	$Q_{gd}$			8		
Gate Resistance	$R_g$	$f = 1\text{ MHz}$		1		$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -30\text{ V}, R_L = 4\text{ }\Omega$ $I_D \cong -20\text{ A}, V_{GS} = -10\text{ V}, R_g = 6\text{ }\Omega$		58		ns
Rise Time	$t_r$			23		
Turn-Off Delay Time	$t_{d(off)}$			105		
Fall Time	$t_f$			21		
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Source-Drain Diode Current	$I_S$	$T_A = 25\text{ }^\circ\text{C}$			- 85	A
Pulse Diode Forward Current <sup>a</sup>	$I_{SM}$				- 340	
Body Diode Voltage	$V_{SD}$	$I_S = -1\text{ A}$			- 1.2	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = -20\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		65		ns
Body Diode Reverse Recovery Charge	$Q_{rr}$				74	

**Notes:**

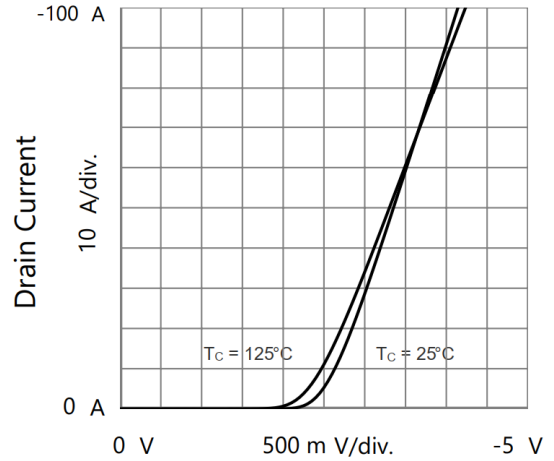
- Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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.

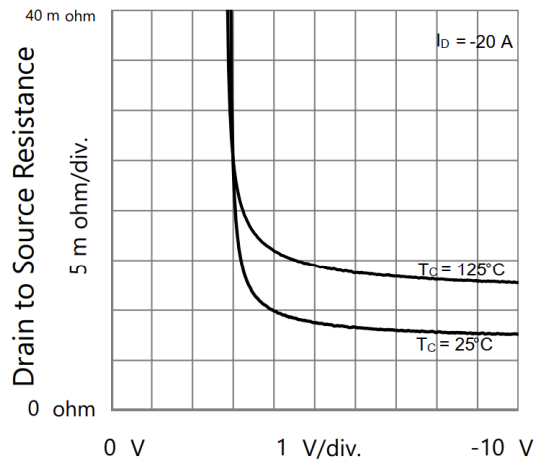
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



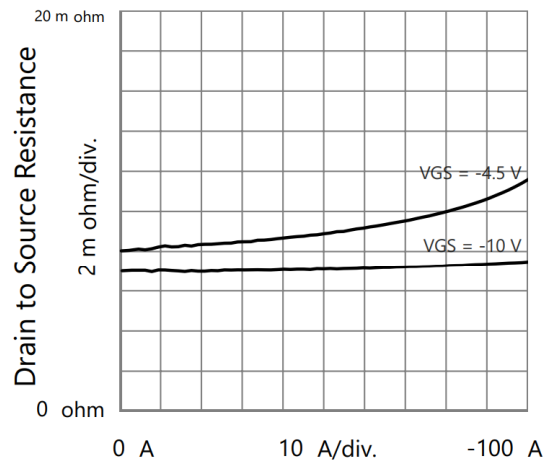
Drain to Source Voltage Output Characteristics



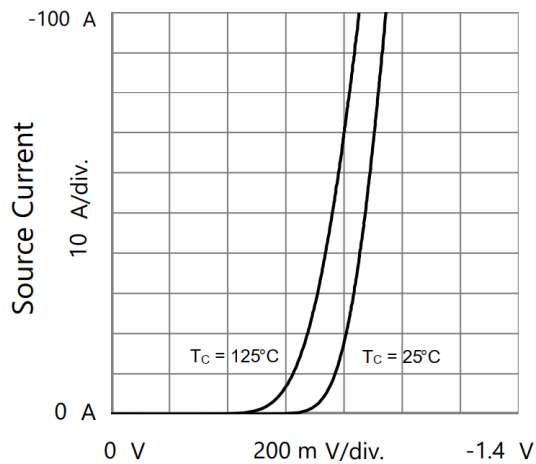
Gate to Source Voltage Transfer Characteristics



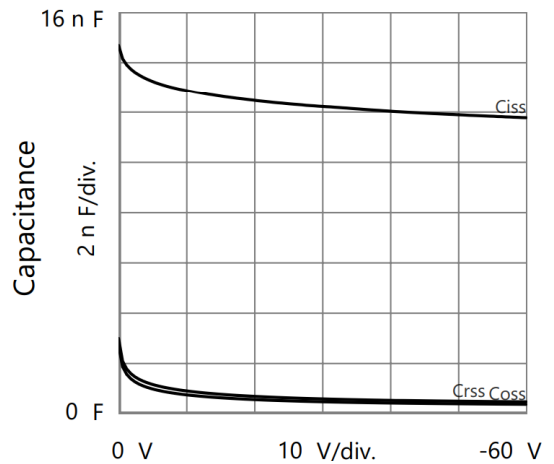
Gate to Source Voltage Drain to Source Resistance vs. Gate to Source Voltage



Drain Current Drain to Source Resistance vs. Drain Current

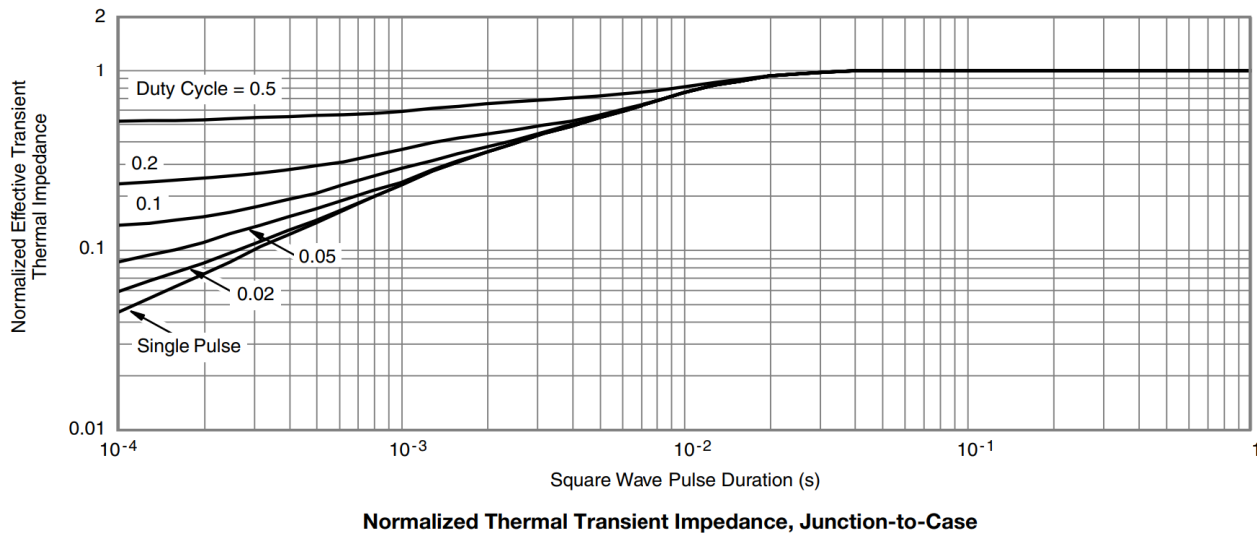
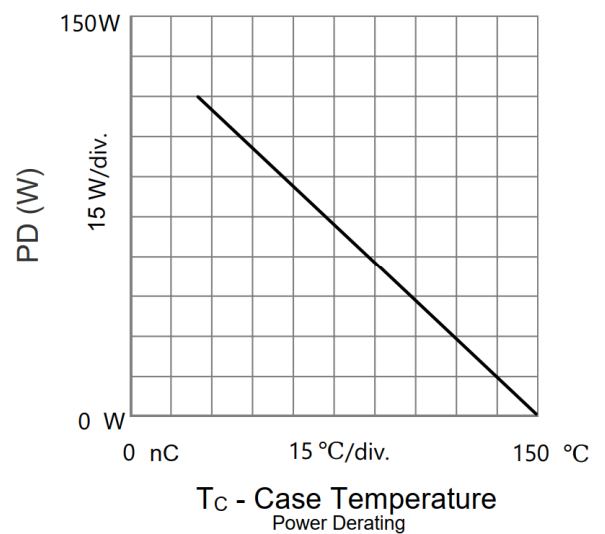
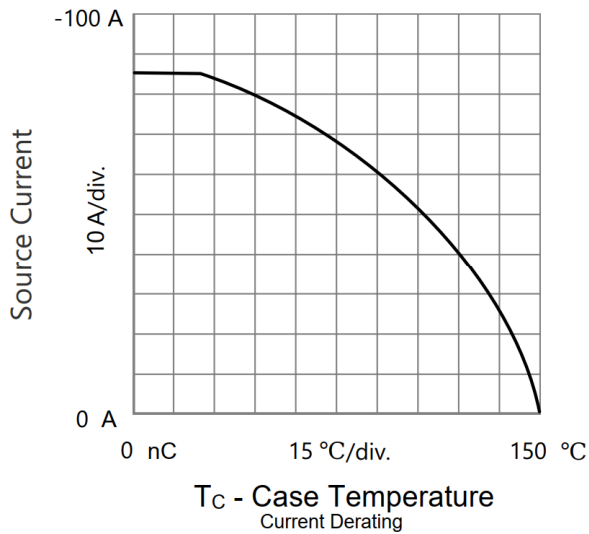
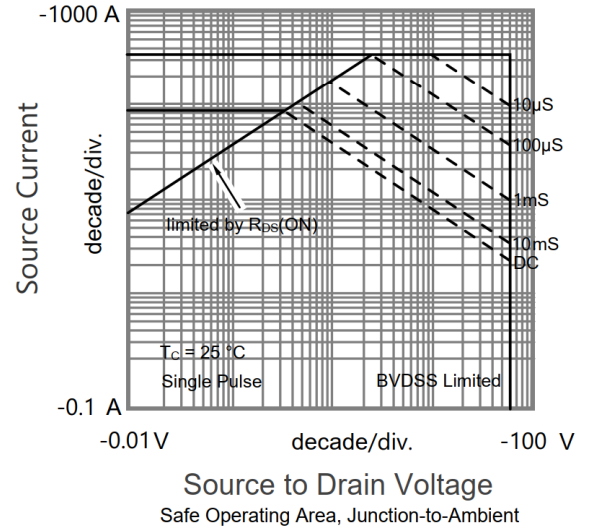
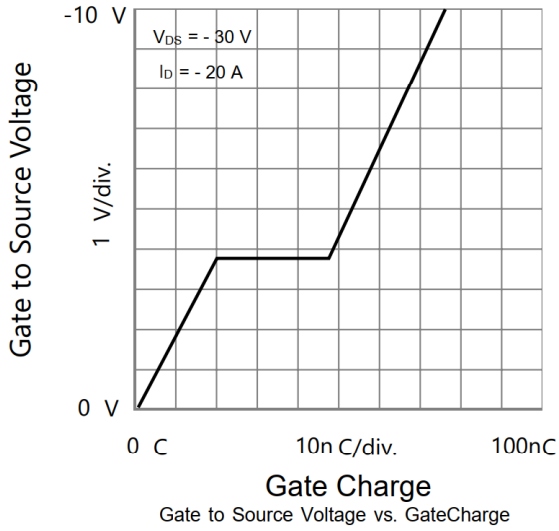


Source to Drain Voltage Body Diode Forward Characteristics

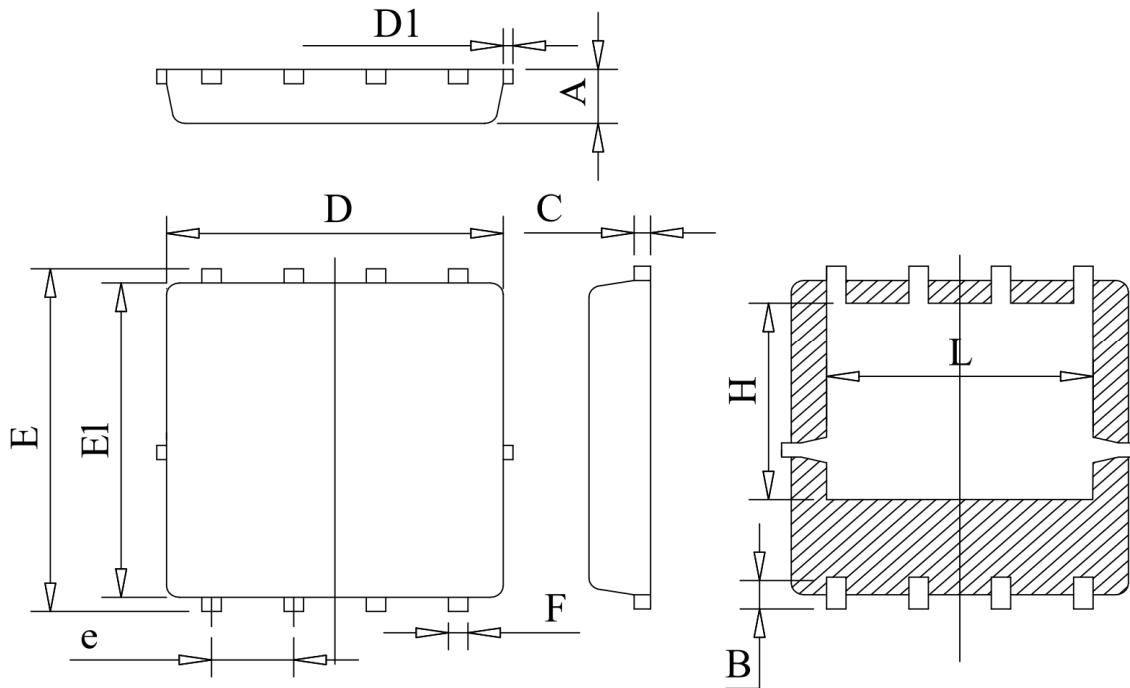


Drain to Source Voltage Capacitances

**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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