

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 at $V_{GS} = - 10$ V	- 85	76 nC
	8.5 at $V_{GS} = - 4.5$ V		

FEATURES

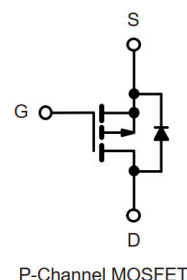
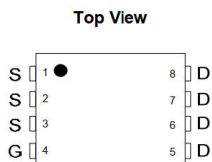
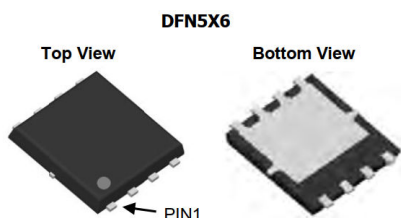
- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested

APPLICATIONS

- PWM Applications
- Load Switch
- Power Management



RoHS
COMPLIANT



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	I_D	- 85	A
		- 54	
Continuous Source Current (Diode Conduction)	I_S	- 85	
Pulsed Drain Current ^a	I_{DM}	- 340	
Single Pulse Avalanche Current	I_{AS}	- 80	
Single Pulse Avalanche Energy	E_{AS}	230	mJ
Maximum Power Dissipation ^b	P_D	120	W
		48	
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-Case (Drain) ^{c,d}	R_{thJC}	1.04	$^\circ\text{C/W}$

Notes:

- Based on $T_C = 25^\circ\text{C}$.
- Pulse test; pulse width 300 μs , duty cycle 2 %.
- When mounted on 1" square PCB (FR-4 material).
- Parametric verification ongoing.

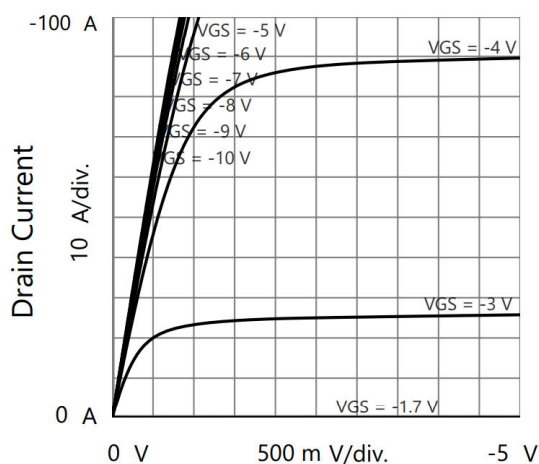
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min .	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = -250 μA	- 60			V
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA			1	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -60V, V _{GS} = 0 V			1	μA
		V _{DS} = -60V, V _{GS} = 0 V, T _J = 125 °C			1	
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 20 A		7	8	mΩ
		V _{GS} = - 4.5 V, I _D = - 20 A		8.5	10	
Forward Transconductance ^a	g _{fs}	V _{DS} = -10 V,I _D = - 20 A		60		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = - 30 V,V _{GS} = 0 V, f = 1 MHz		12300		pF
Output Capacitance	C _{oss}			485		
Reverse Transfer Capacitance	C _{rss}			604		
Total Gate Charge	Q _g	V _{DS} = -10 V,V _{GS} = -30 V, I _D = -20 A		76		nC
Gate-Source Charge	Q _{gs}			10		
Gate-Drain Charge	Q _{gd}			8		
Gate Resistance	R _g	f = 1 MHz		1		Ω
Turn-On Delay Time	t _{d(on)}	V _{DS} = -30 V, R _L = 4 Ω I _D ≅ -20 A, V _{GS} = -10 V, R _g = 6 Ω		58		ns
Rise Time	t _r			23		
Turn-Off Delay Time	t _{d(off)}			105		
Fall Time	t _f			21		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _A = 25 °C			- 85	A
Pulse Diode Forward Current ^a	I _{SM}				- 340	
Body Diode Voltage	V _{SD}	I _S = - 1 A			- 1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 20 A, di/dt = 100 A/μs, T _J = 25 °C		65		ns
Body Diode Reverse Recovery Charge	Q _{rr}			74		nC

Notes:

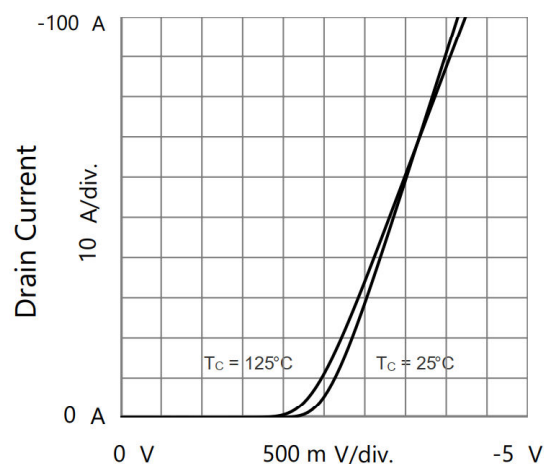
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

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.

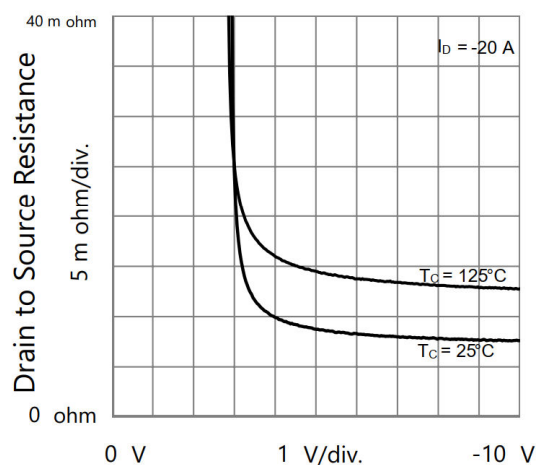
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



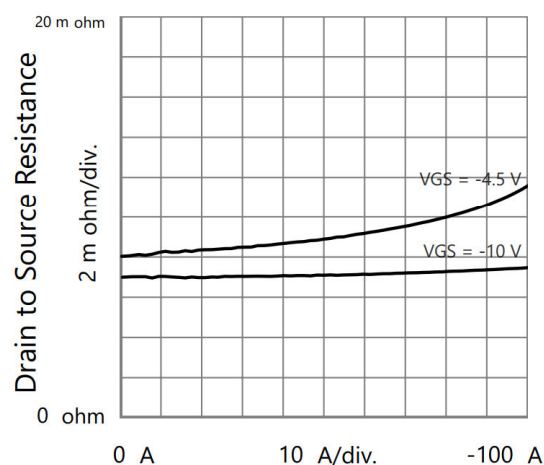
Drain to Source Voltage
Output Characteristics



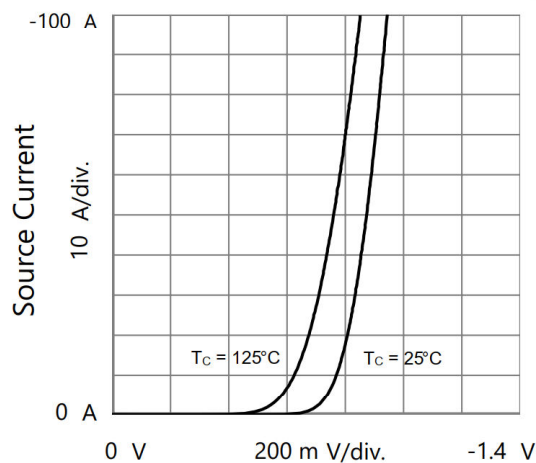
Gate to Source Voltage
Transfer Characteristics



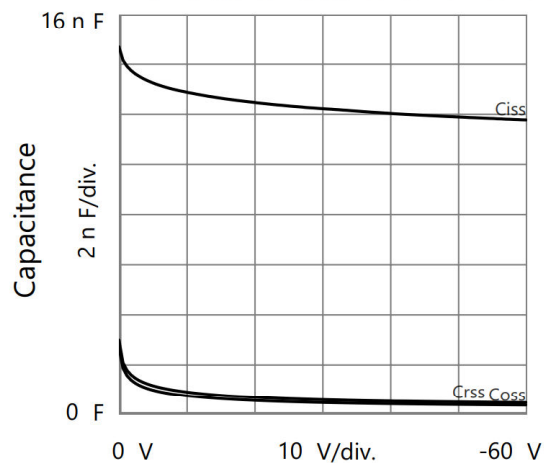
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

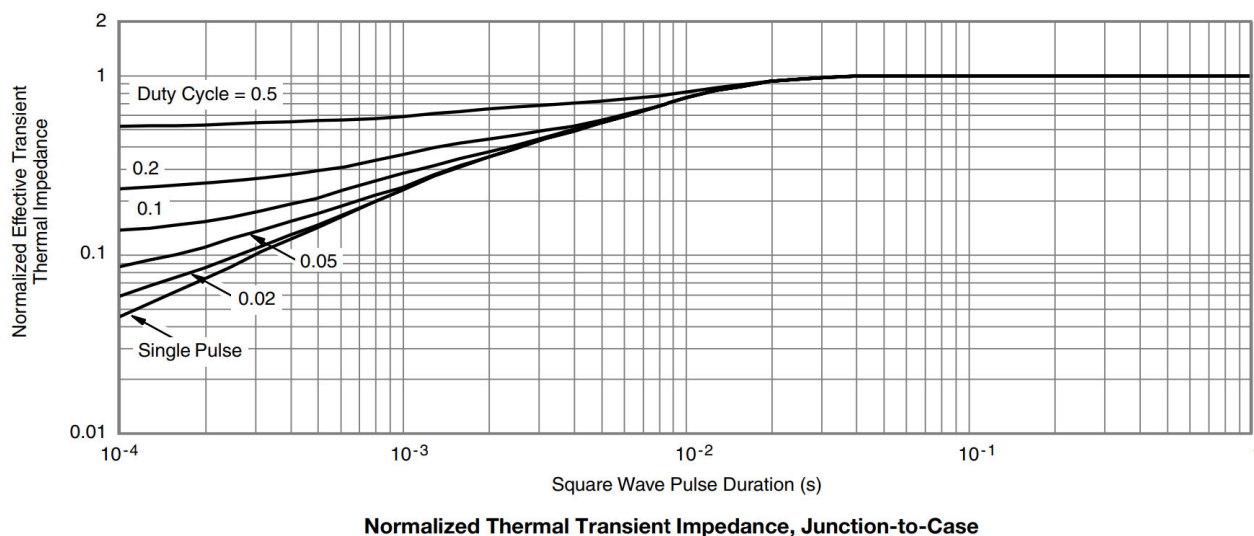
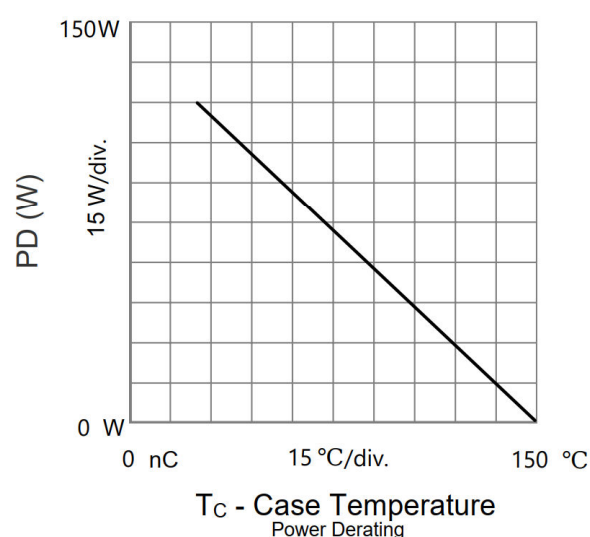
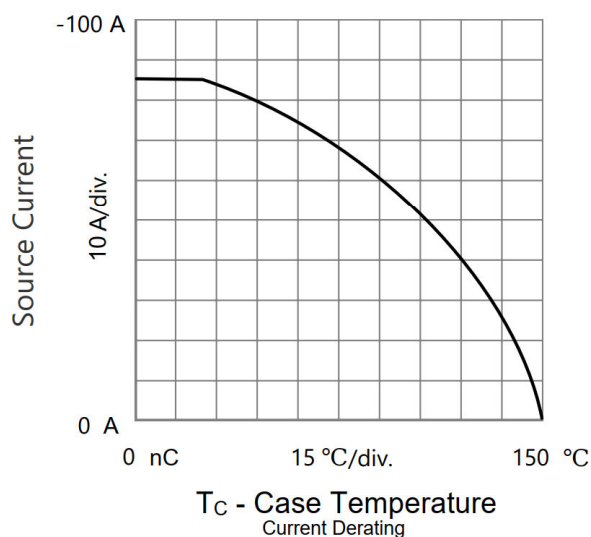
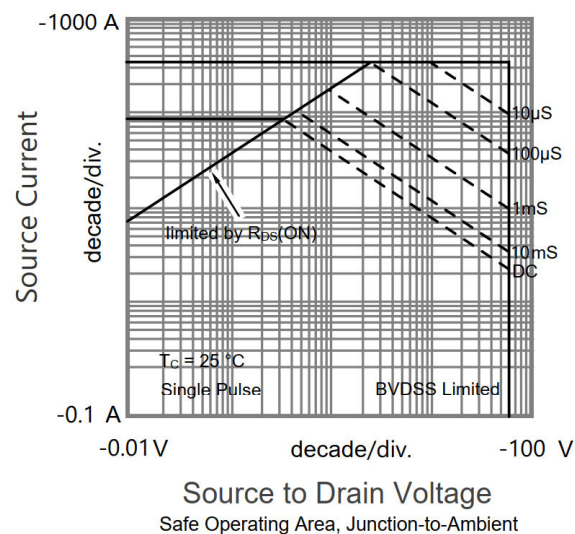
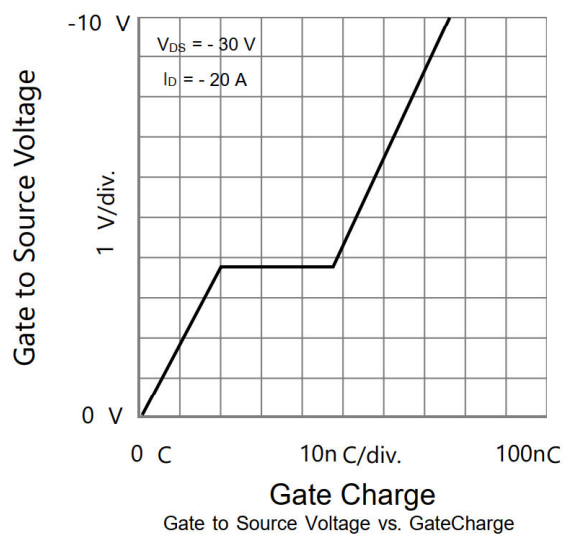


Source to Drain Voltage
Body Diode Forward Characteristics



Drain to Source Voltage
Capacitances

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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