

P-Channel 15 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)(Typ.)	I_D (A) ^a	Q_g (Typ.)
-15	13.5 at $V_{GS} = -4.5$ V	-17	16 nC
	19.6 at $V_{GS} = -2.5$ V		

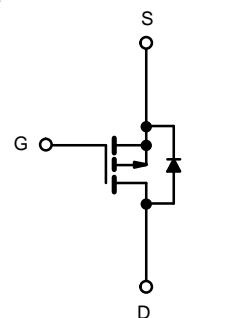
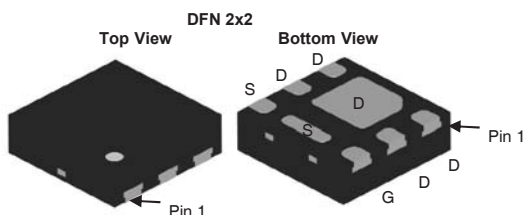
FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested
- Low Gate Charge
- High Power and current handling capability


RoHS
 COMPLIANT

APPLICATIONS

- PWM Application
- Load Switch
- Power management



P-Channel MOSFET

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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	-15	V
Gate-Source Voltage	V_{GS}	± 8	
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	-17	A
		-11	
Pulsed Drain Current ^b	I_{DM}	-68	
Maximum Power Dissipation ^c	P_D	5.5	W
		2.2	
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 (PCB Mount) ^d	R_{thJA}	22.7	$^\circ\text{C/W}$

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	-15	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	-0.4	-	-1	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 8 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -12 V, V _{GS} = 0 V	-	-	-1	μA
		V _{DS} =-12V, V _{GS} = 0 V, T _J = 125 °C	-	-	-100	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ - 5 V, V _{GS} = -5 V	-10	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = -4.5 V, I _D = - 5 A	-	13.5	18	mΩ
		V _{GS} = -2.5 V, I _D = - 4 A	-	19.6	26	
Forward Transconductance ^a	g _{fs}	V _{DS} = - 5 V, I _D = - 5 A	-	14	-	S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = - 10 V, f = 1 MHz	-	1450	-	pF
Output Capacitance	C _{oss}		-	320	-	
Reverse Transfer Capacitance	C _{rss}		-	280	-	
Total Gate Charge ^c	Q _g	V _{DS} = - 10 V, V _{GS} = - 4.5 V, I _D = - 5 A	-	16	-	nC
Gate-Source Charge ^c	Q _{gs}		-	3.5	-	
Gate-Drain Charge ^c	Q _{gd}		-	4.2	-	
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = - 10 V, R _g = 3 Ω, R _L =2 Ω V _{GS} = - 4.5 V	-	16	-	ns
Rise Time ^c	t _r		-	65	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	72	-	
Fall Time ^c	t _f		-	63	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T _J = 25 °C)						
Continuous Source-Drain Diode Current	I _S	T _A = 25 °C	-	-	-11.5	A
Pulsed Current	I _{SM}		-	-	-46	A
Forward Voltage ^a	V _{SD}	I _F = -5 A, V _{GS} = 0 V	-	-	-1.2	V

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.
 c. 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)

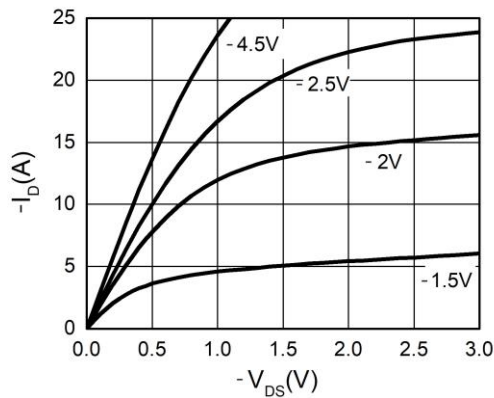


Figure 1. Output Characteristics

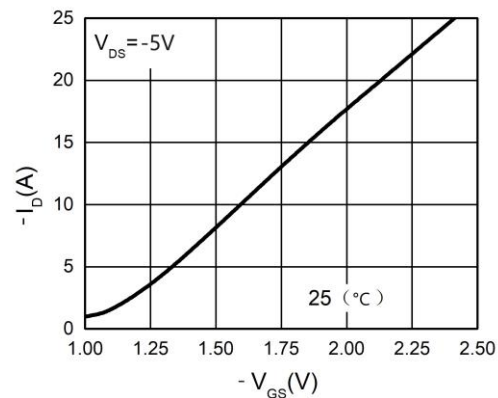


Figure 2. Transfer Characteristics

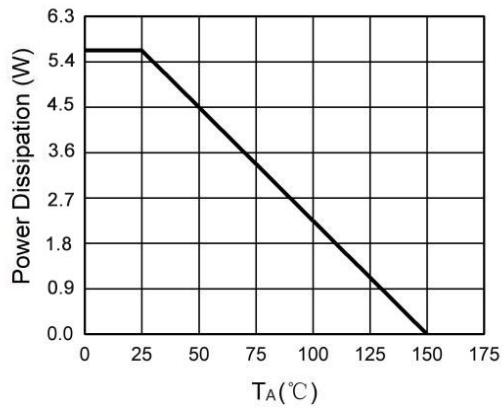


Figure 3. Power Dissipation

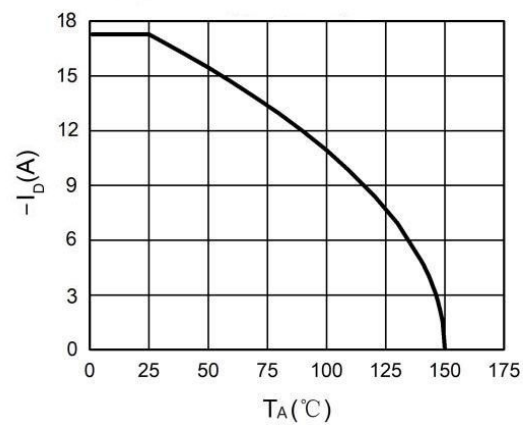


Figure 4. Drain Current

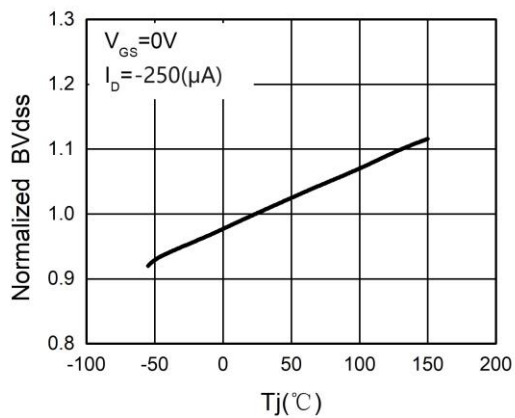


Figure 5. BV_{DS} vs Junction Temperature

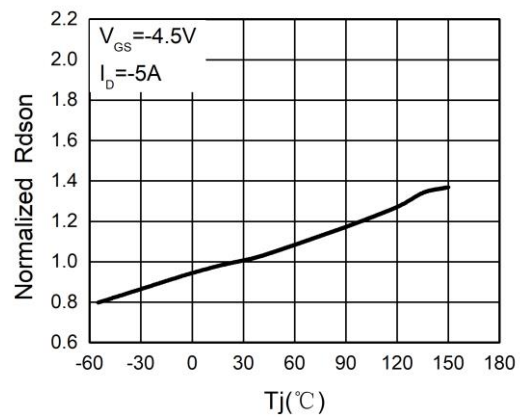


Figure 6. R_{DS(ON)} vs Junction Temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

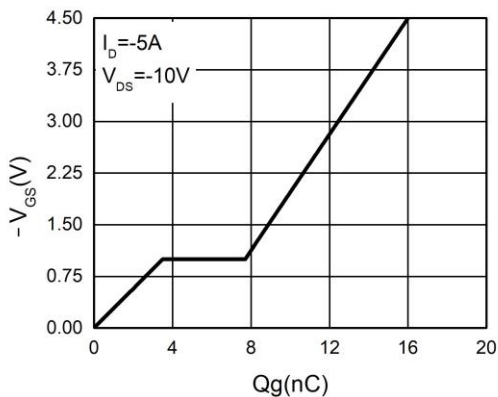


Figure 7. Gate Charge Waveforms

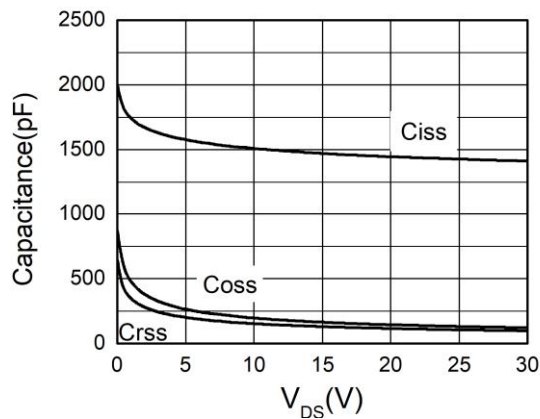


Figure 8. Capacitance

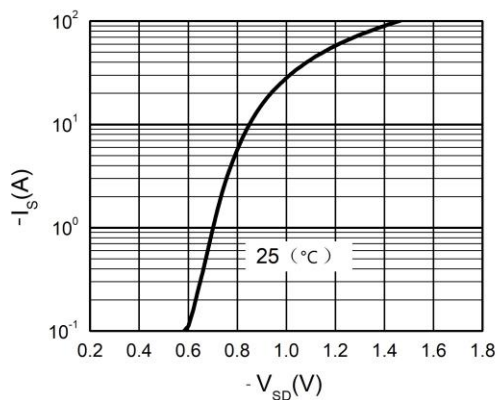


Figure 9. Body-Diode Characteristics

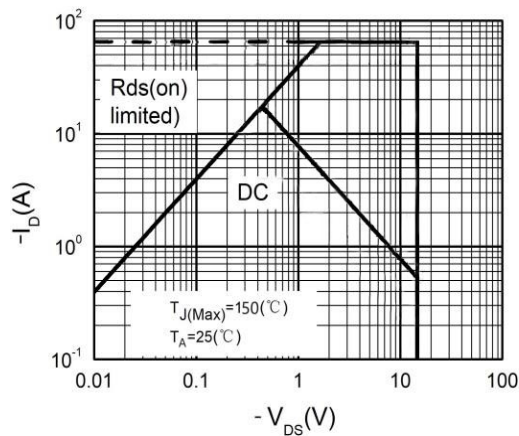
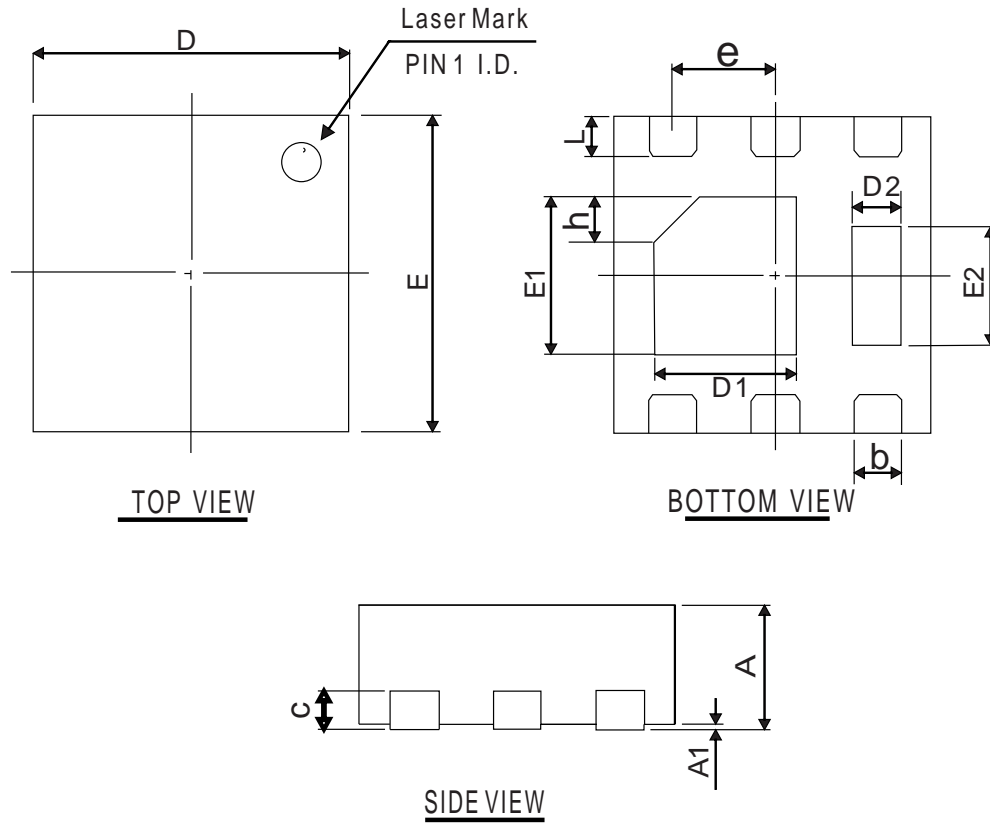


Figure 10. Maximum Safe Operating Area

DFN 2X2 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.60	0.75	0.90
A1	0.00	0.02	0.10
b	0.15	0.25	0.40
D	1.80	2.00	2.25
E	1.80	2.00	2.25
D1	0.70	0.90	1.10
E1	0.75	1.00	1.20
D2	0.15	0.30	0.45
E2	0.45	0.75	0.95
L	0.15	0.25	0.40
h	0.15	0.25	0.40
c	0.203 REF		
e	0.65 BSC		

Other thickness dimensions are as follows

A	0.50	0.55	0.60
A	0.40	0.45	0.50

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