

N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)(Typ.)	I_D (A) ^a	Q_g (Typ.)
30	0.2 at $V_{GS} = 4.5$ V	1	1.3 nC
	0.3 at $V_{GS} = 2.5$ V		

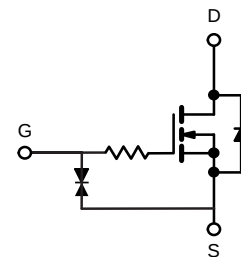
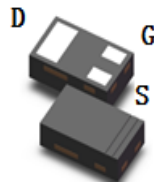
FEATURES

- DT-Trench Power MOSFET
- Fast switching
- Low $R_{DS(ON)}$
- This is a Pb Free Device
- RoHS Compliant

APPLICATIONS

- Low Side Load Switch
- Level Shift Circuits
- Gate to Source ESD protected, HBM >2KV
- Portable Applications i.e. DSC, PDA, Cell Phone, etc.

DFN1006 Pin Configuration



N-Channel MOSFET

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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 8	
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	1	A
		0.8	
Pulsed Drain Current ^b	I_{DM}	3.7	
Maximum Power Dissipation ^c	P_D	225	mW
		90	
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}	390	$^\circ\text{C/W}$

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 $T_a = 25^\circ\text{C}$.

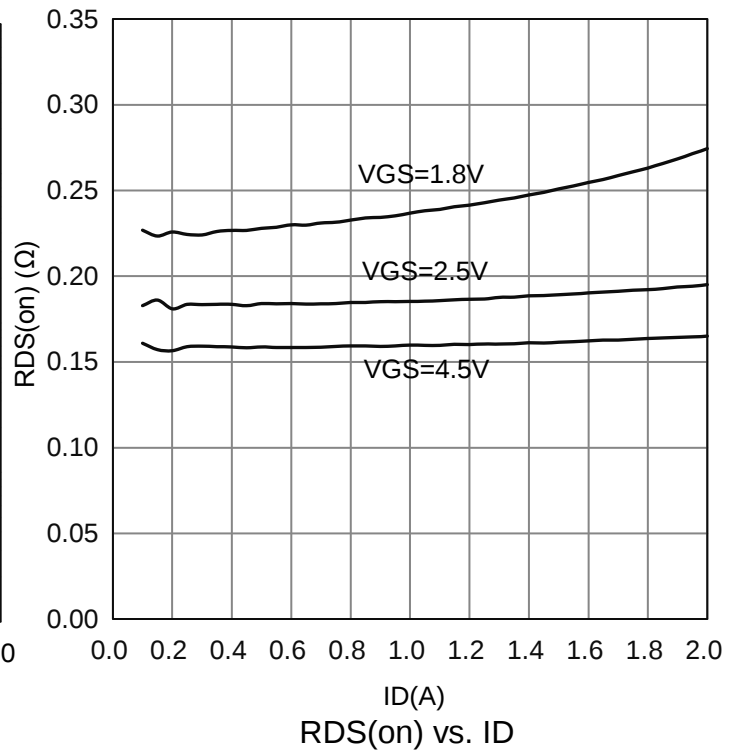
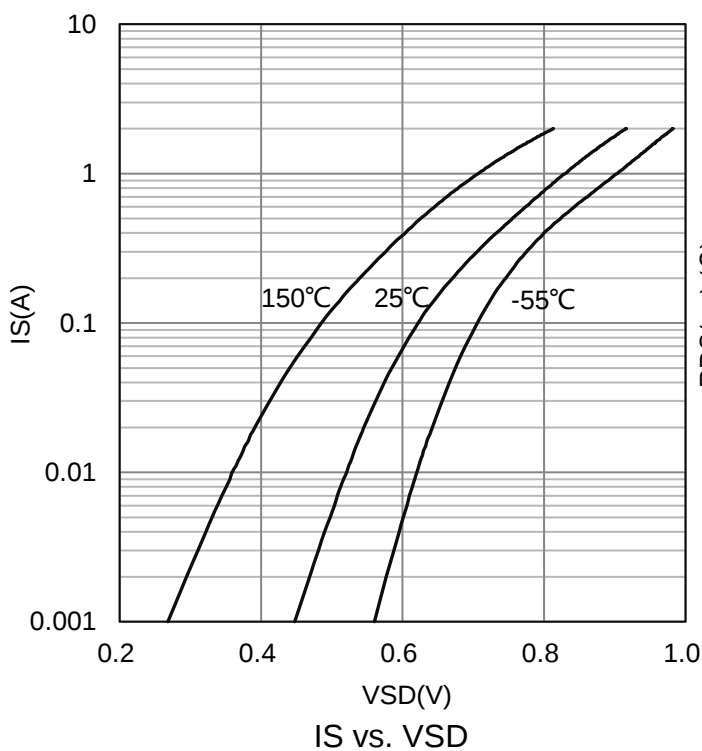
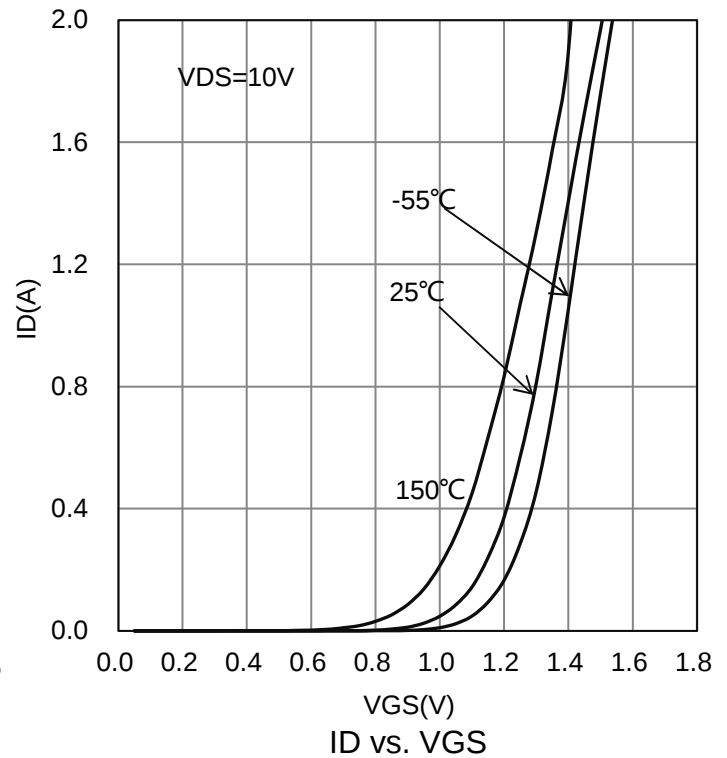
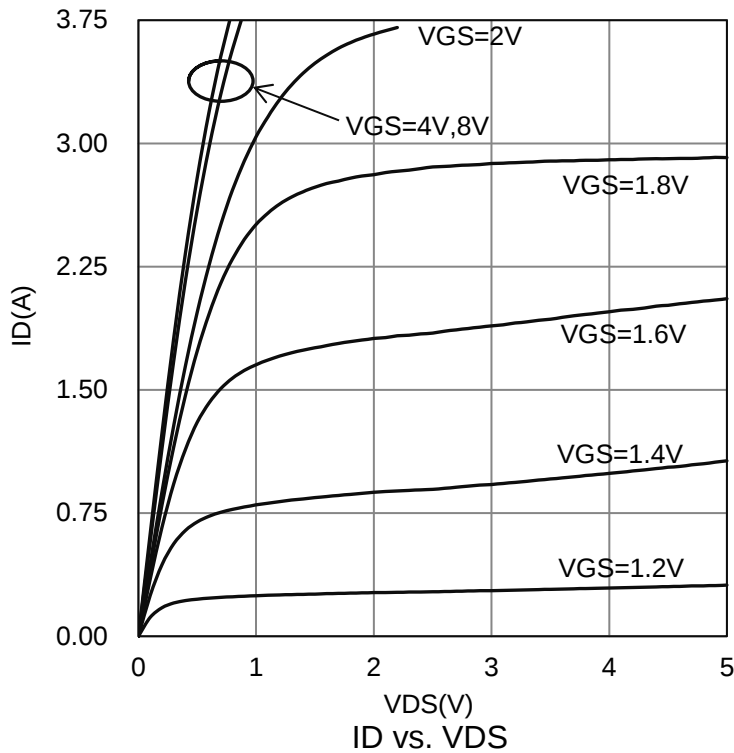
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	30	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.45	-	0.9	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 8V	-	-	± 10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 55 °C	-	-	100	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	1	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 0.5 A	-	0.2	0.3	Ω
		V _{GS} = 2.5 V, I _D = 0.3 A	-	0.3	0.4	
		V _{GS} = 1.8 V, I _D = 0.1 A	-	0.4	0.5	
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz	-	99	-	pF
Output Capacitance	C _{oss}		-	7.4	-	
Reverse Transfer Capacitance	C _{rss}		-	5.2	-	
Total Gate Charge ^c	Q _g	V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 1 A	-	1.3	-	nC
Gate-Source Charge ^c	Q _{gs}		-	0.16	-	
Gate-Drain Charge ^c	Q _{gd}		-	0.44	-	
Gate Resistance	R _g	f = 1 MHz	-	2129	-	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 15 V, I _D = 1 A, R _g = 6 Ω V _{GS} = 10 V	-	20.5	-	ns
Rise Time ^c	t _r		-	39.7	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	689	-	
Fall Time ^c	t _f		-	191	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T _J = 25 °C)						
Continuous Source-Drain Diode Current	I _S	T _A = 25 °C	-	-	1	A
Pulsed Current	I _{SM}		-	-	3.7	A
Forward Voltage ^a	V _{SD}	I _F = 0.3 A, V _{GS} = 0 V	-	-	1.2	V

Notes

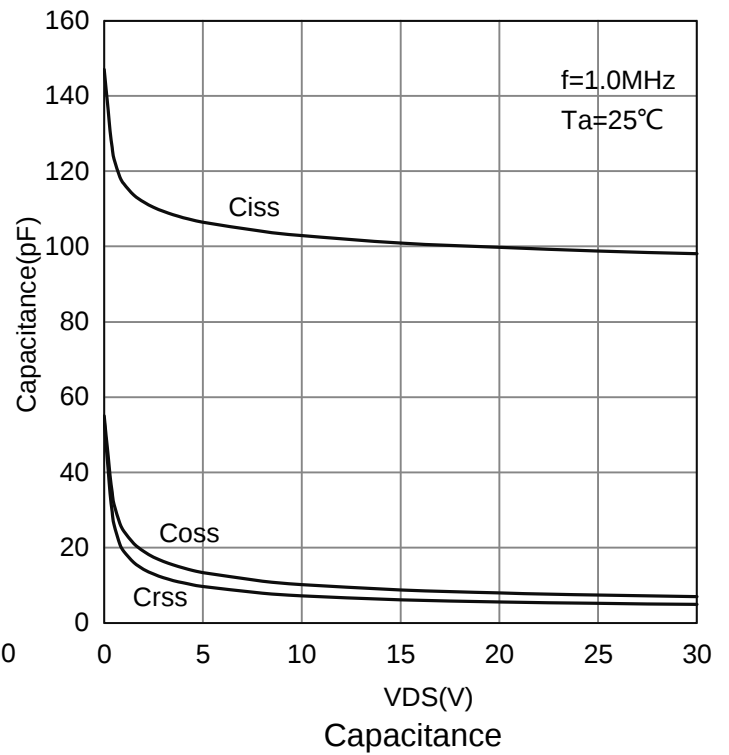
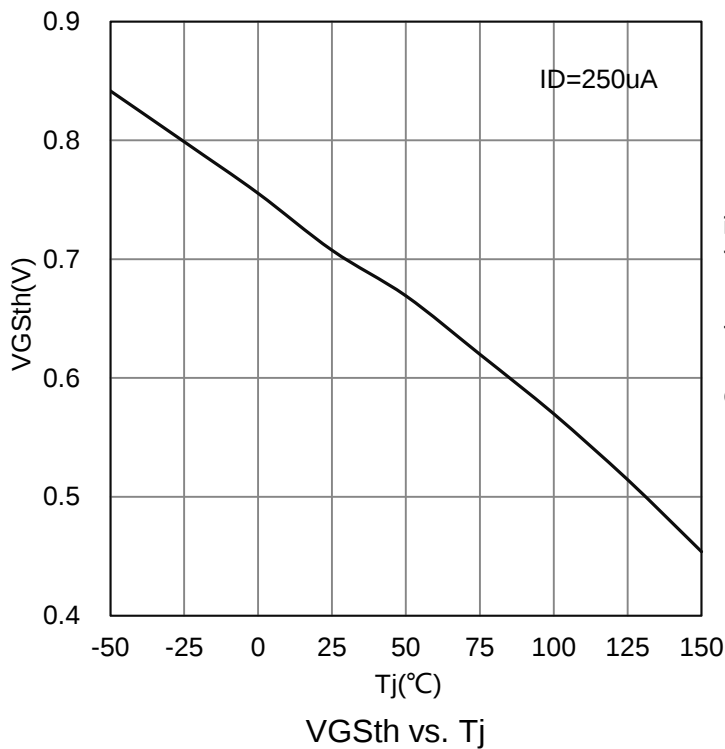
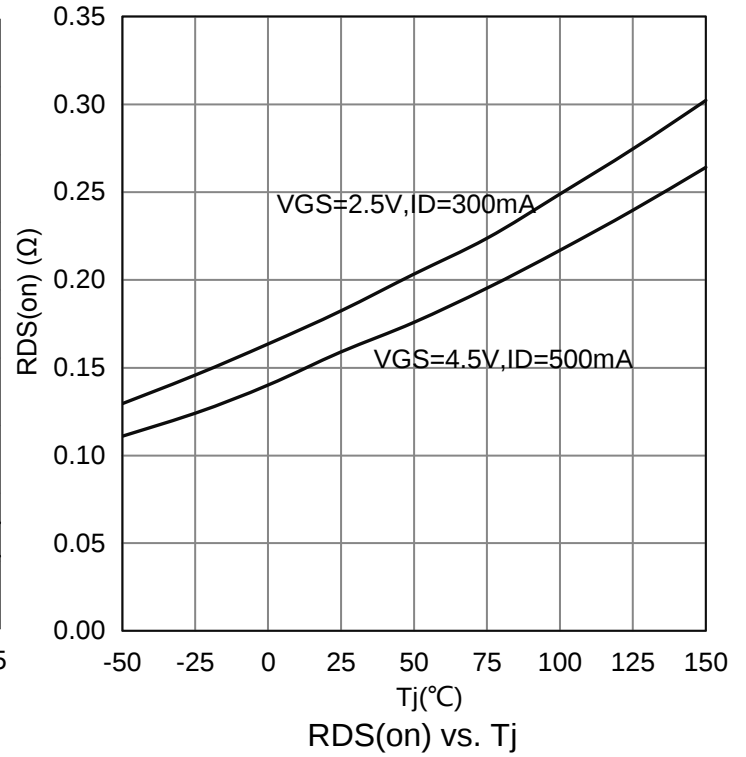
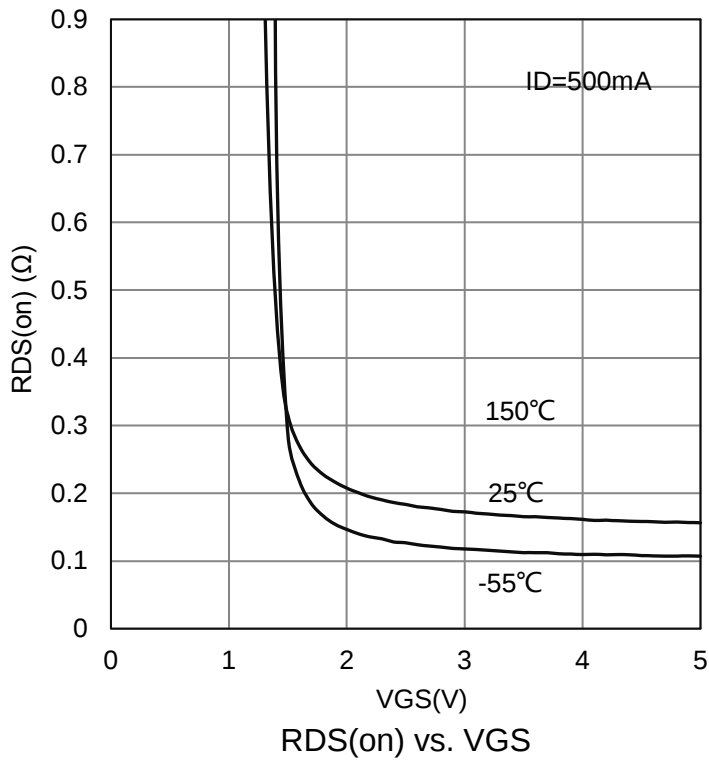
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.
 c. Independent of operating temperature.

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.

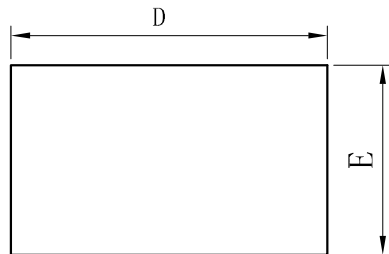
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



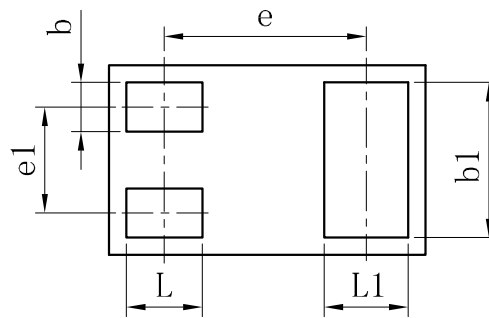
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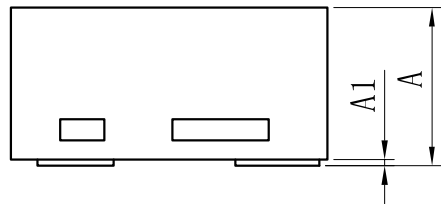
OUTLINE AND DIMENSIONS



TOP VIEW



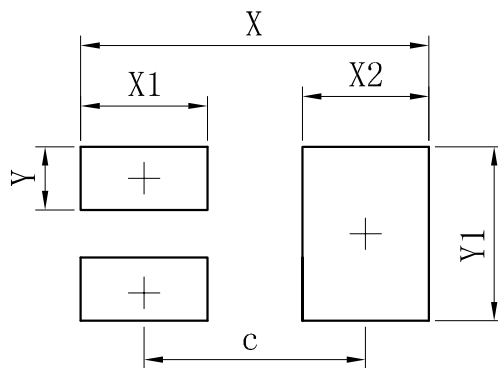
BOTTOM VIEW



SIDE VIEW

DFN1006			
Dim	Min	Typ	Max
D	0.95	1.00	1.05
E	0.55	0.60	0.65
e	—	0.64	—
e1	—	0.34	—
L	0.19	0.24	0.29
L1	0.22	0.27	0.32
b	0.10	0.15	0.20
b1	0.44	0.49	0.54
A	0.43	0.48	0.53
A1	0	—	0.05
All Dimensions in mm			

SOLDERING FOOTPRINT



Dimensions	(mm)
c	0.70
X	1.10
X1	0.40
X2	0.40
Y	0.20
Y1	0.55

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