N-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)(Typ.)	I_D (A)[a]	Q_g (Typ.)
20	0.2 at V_{GS} = 4.5 V	1	1.3 nC
	0.3 at V_{GS} = 2.5 V		

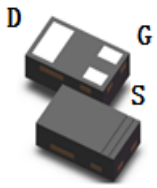
FEATURES

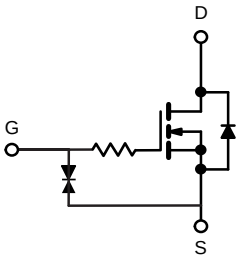
- DT-Trench Power MOSFET
- Fast switching
- Low RDS(ON)
- This is a Pb Free Device
- RoHS Compliant

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 °C, unless otherwise noted)				
PARAMETER		**SYMBOL**	**LIMIT**	**UNIT**
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 8	
Continuous Drain Current (T_J = 150 °C)[a]	T_A = 25 °C	I_D	1	A
	T_A = 100 °C		0.65	
Pulsed Drain Current[b]		I_{DM}	4	
Maximum Power Dissipation[c]	T_A = 25 °C	P_D	500	mW
	T_A = 100 °C		350	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	**SYMBOL**	**LIMIT**	**UNIT**
Junction-to-Ambient (PCB Mount)[d]	R_{thJA}	250	°C/W

Notes

a. Calculated continuous current based on maximum allowablejunction temperature.
b. Repetitive rating; pulse width limited by max. junction temperature.
c. Pd is based on max. junction temperature, using junction-case thermal resistance.
d. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper,in a still air environment with Ta=25 °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	20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	0.4	-	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} = 20V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 16 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} = 10 V, f = 1 MHz	-	49	-	pF
Output Capacitance	C_{oss}		-	10	-	
Reverse Transfer Capacitance	C_{rss}		-	5	-	
Total Gate Charge [c]	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 0.5 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} = 10 V, I_D =0.5 A, R_g = 6 Ω, V_{GS} = 4.5 V	-	5	-	ns
Rise Time [c]	t_r		-	5	-	
Turn-Off Delay Time [c]	$t_{d(off)}$		-	25	-	
Fall Time [c]	t_f		-	10	-	
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}		-	-	4	A
Forward Voltage [a]	V_{SD}	I_F = 0.5 A, V_{GS} = 0 V	-	-	1.2	V

Notes

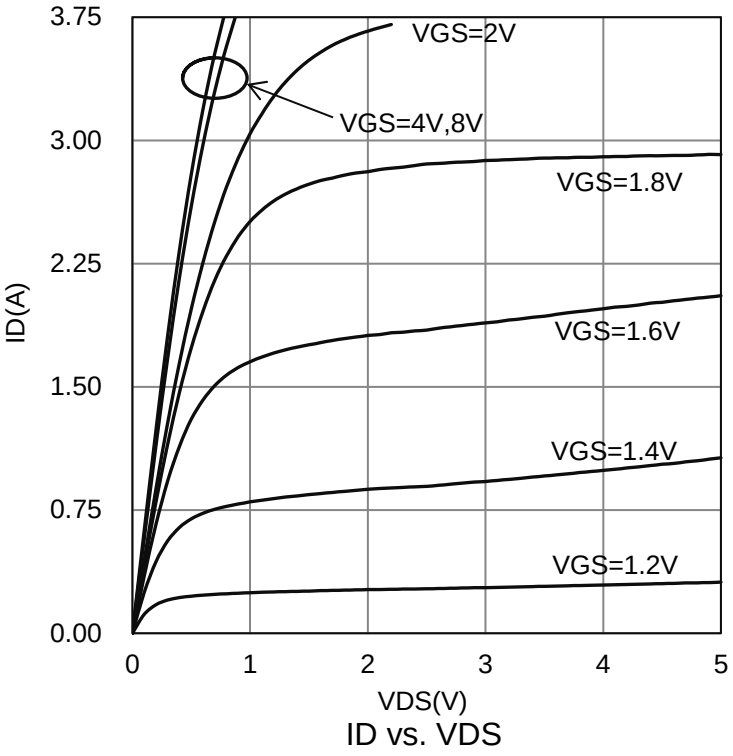
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

b. Guaranteed by design, not subject to production testing.

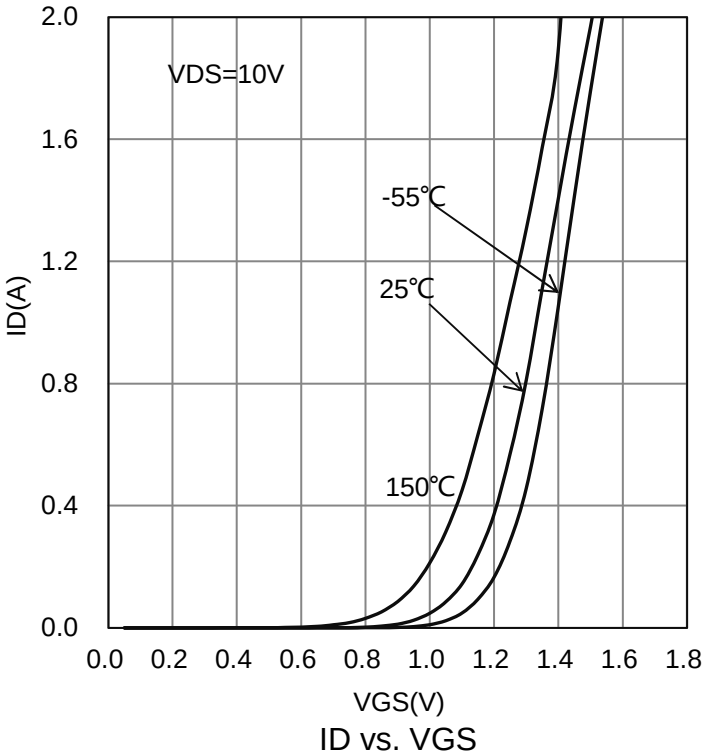
c. Independent of operating temperature.

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.

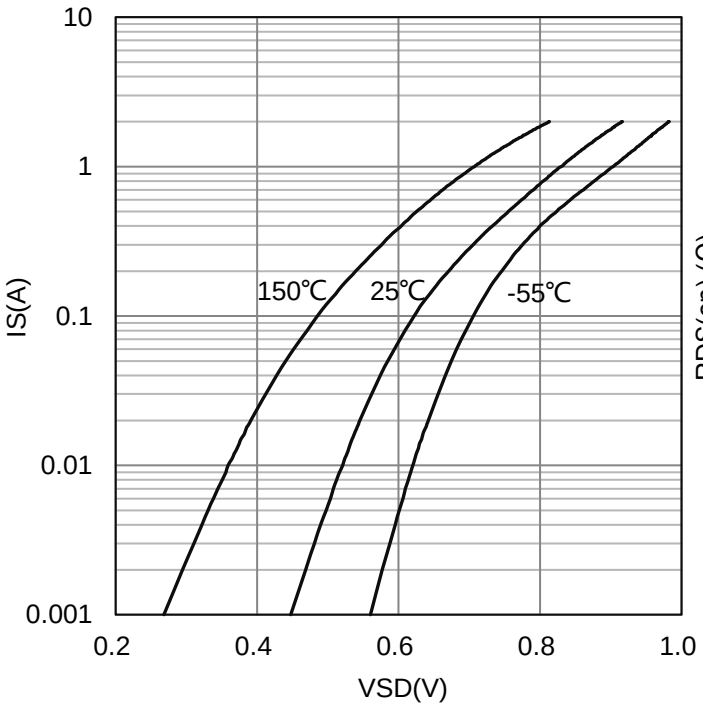
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



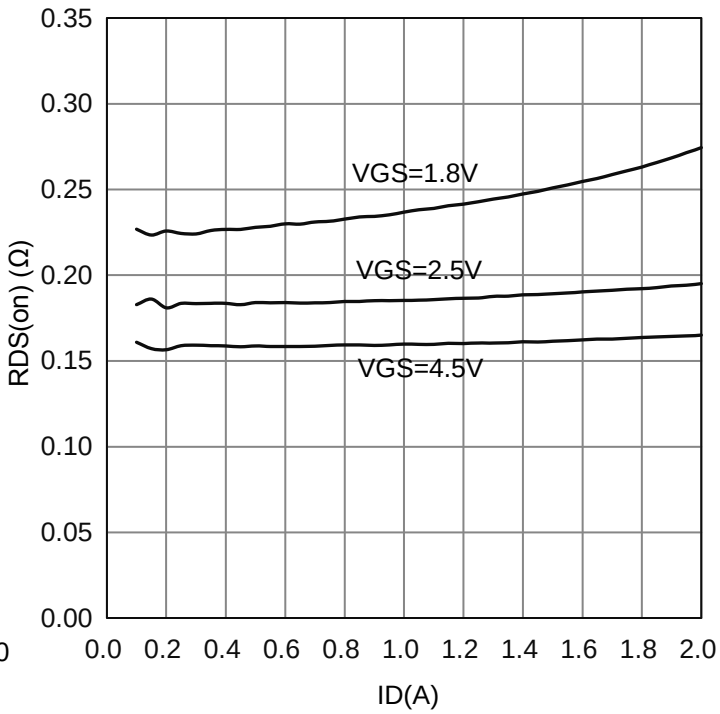
ID vs. VDS



ID vs. VGS

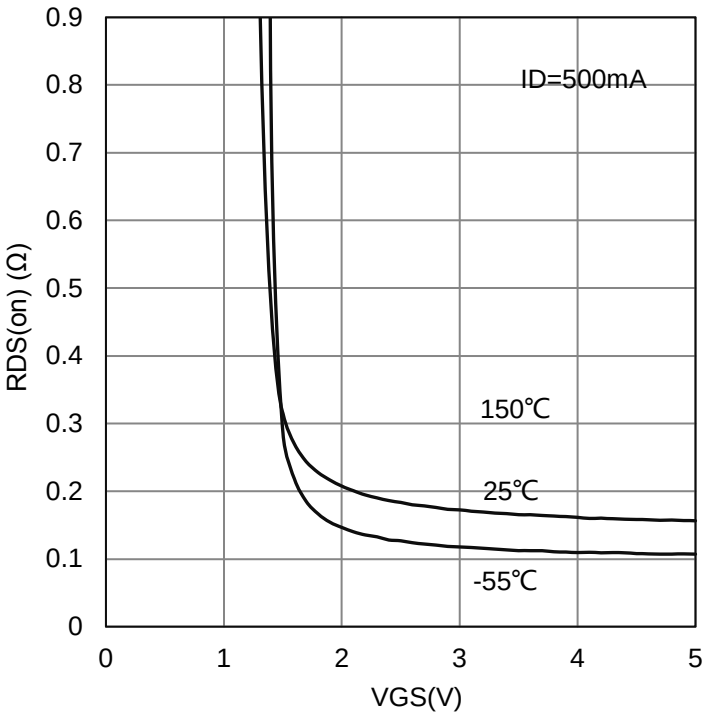


IS vs. VSD

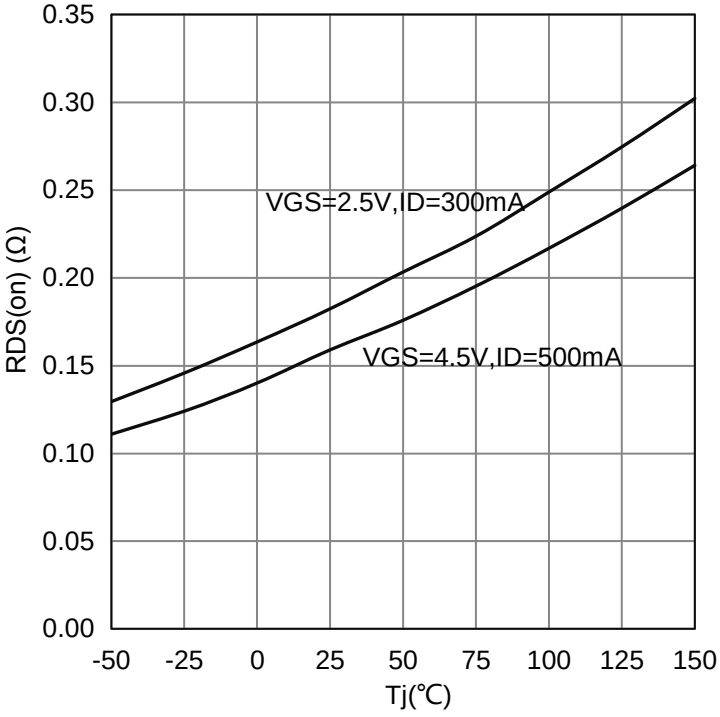


RDS(on) vs. ID

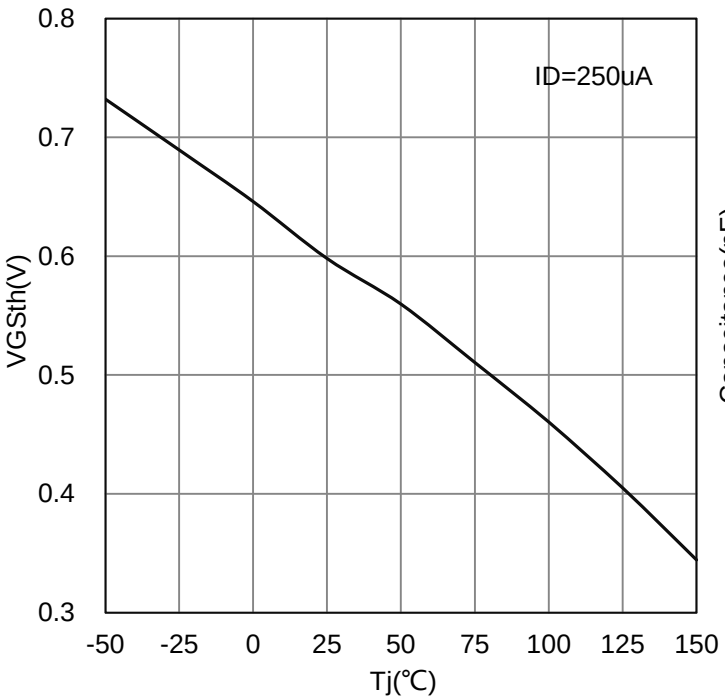
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



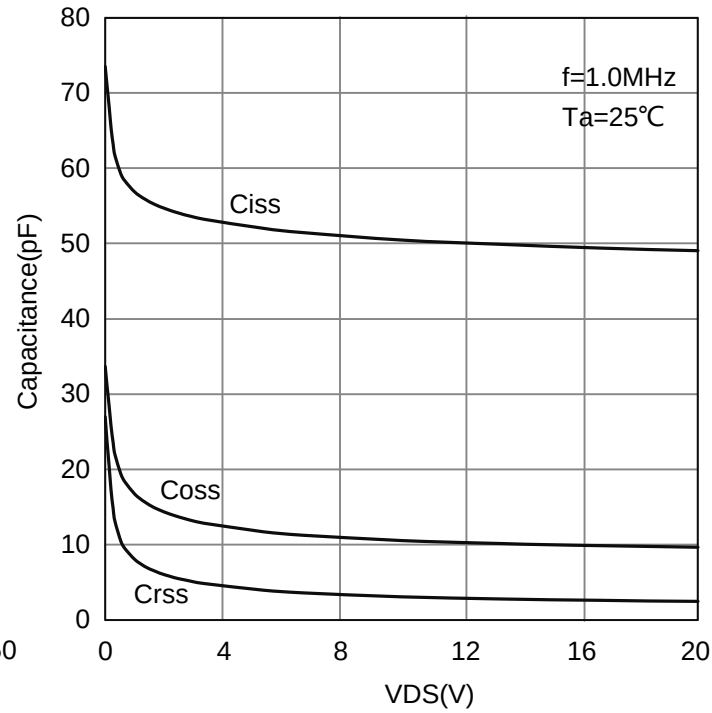
RDS(on) vs. VGS



RDS(on) vs. Tj

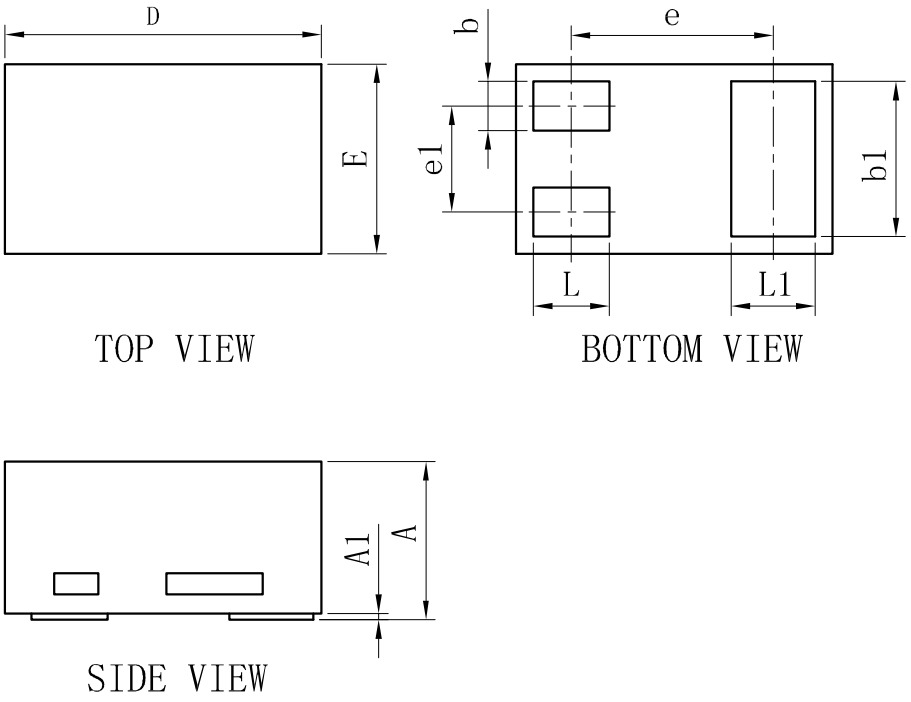


VGSth vs. Tj



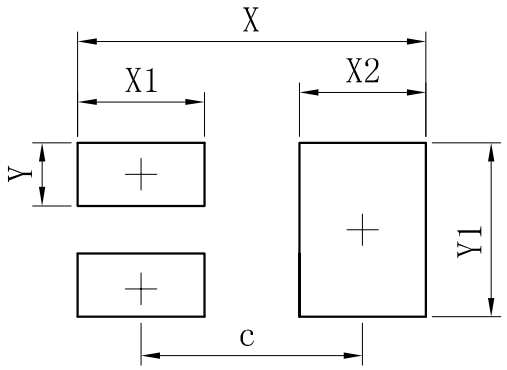
Capacitance

OUTLINE AND DIMENSIONS



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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