

N-Channel 50 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω) (Typ.)	I_D (A) ^a	Q_g (Typ.)
50	1.2 at $V_{GS} = 10$ V	0.31	1.7 nC
	1.4 at $V_{GS} = 4.5$ V		

FEATURES

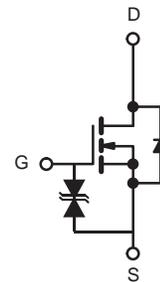
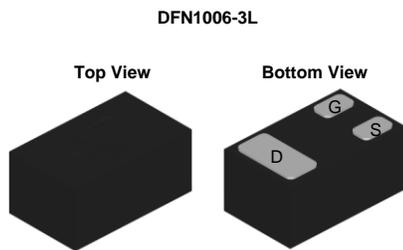
- DT-Trench Power MOSFET
- Surface Mount Package
- ESD Protection



RoHS
COMPLIANT

APPLICATIONS

- Battery operated systems
- Direct logic-level interface: TTL/CMOS



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_J = 25$ °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150$ °C)	I_D	$T_A = 25$ °C	A
		$T_A = 70$ °C	
Pulsed Drain Current	I_{DM}	1.55	
Maximum Power Dissipation ^a	P_D	$T_A = 25$ °C	W
		$T_A = 70$ °C	
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) ^b	R_{thJA}	355	°C/W

Notes:

a. $T_C = 25$ °C.

b. Surface mounted on 1" x 1" FR4 board.

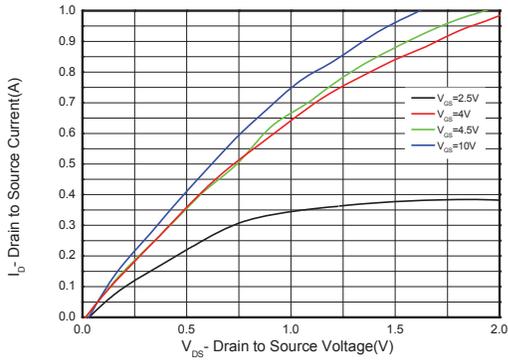
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	50	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.8	-	2	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 240\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	μA
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	0.31	-	-	A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 0.45\text{ A}$	-	1.2	1.8	Ω
		$V_{GS} = 4.5\text{ V}, I_D = 0.25\text{ A}$	-	1.4	2	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 0.1\text{ A}$	-	0.5	-	S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 15\text{ V}, f = 1\text{ MHz}$	-	23	40	pF
Output Capacitance	C_{oss}		-	12	19	
Reverse Transfer Capacitance	C_{rss}		-	5	10	
Total Gate Charge ^c	Q_g	$V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 0.1\text{ A}$	-	1.7	2.5	nC
Gate-Source Charge ^c	Q_{gs}		-	0.4	0.6	
Gate-Drain Charge ^c	Q_{gd}		-	0.45	0.8	
Switching Parameters						
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 30\text{ V}, I_D = 0.2\text{ A},$ $V_{GS} = 10\text{ V}, R_g = 3.5\text{ }\Omega$	-	8.6	-	ns
Rise Time	t_r		-	4	-	
Turn-Off Delay Time	$t_{d(off)}$		-	23	-	
Fall Time	t_f		-	14	-	
Drain-Source Body Diode Ratings and Characteristics ^b ($T_C = 25\text{ }^\circ\text{C}$)						
Continuous Source Current	I_S	$T_C = 25\text{ }^\circ\text{C}$	-	-	0.31	A
Pulsed Source Current	I_{SM}		-	-	1.55	A
Forward Voltage ^a	V_{SD}	$I_S = 0.2\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.2	V

Notes

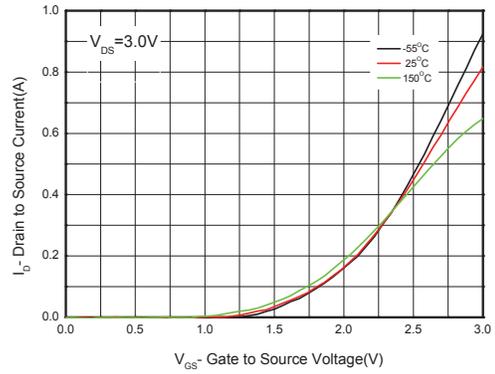
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

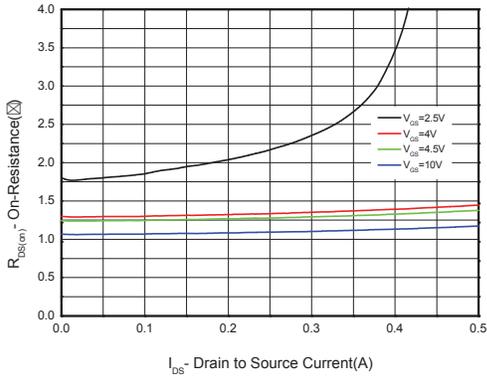
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



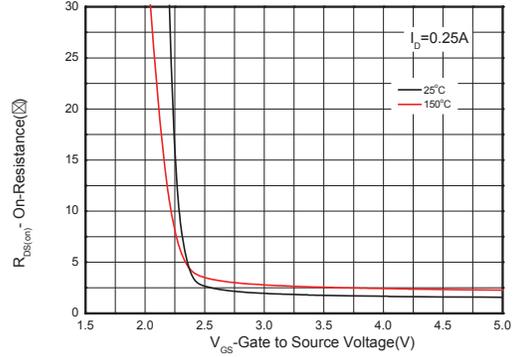
Output characteristics



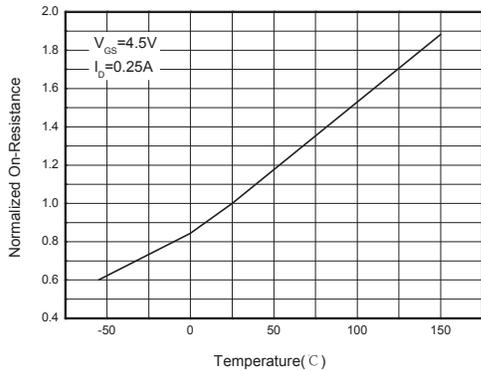
Transfer characteristics



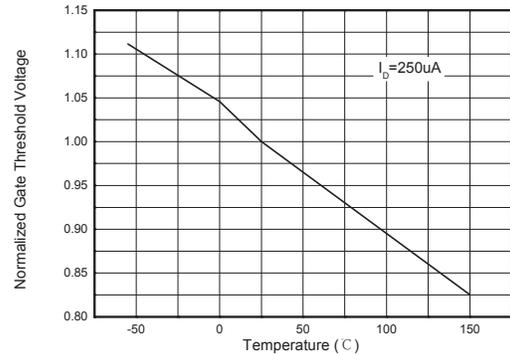
On-Resistance vs. Drain current



On-Resistance vs. Gate-to-Source voltage

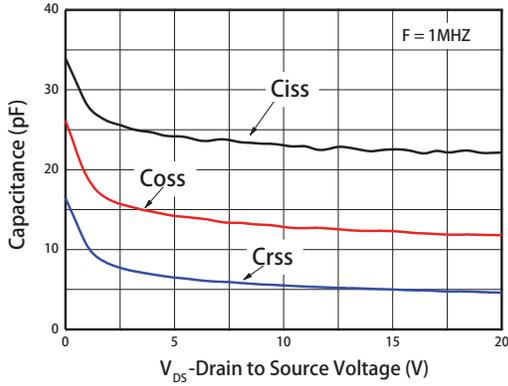


On-Resistance vs. Junction temperature

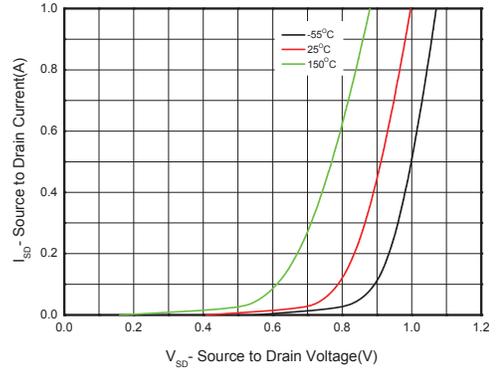


Threshold voltage vs. Temperature

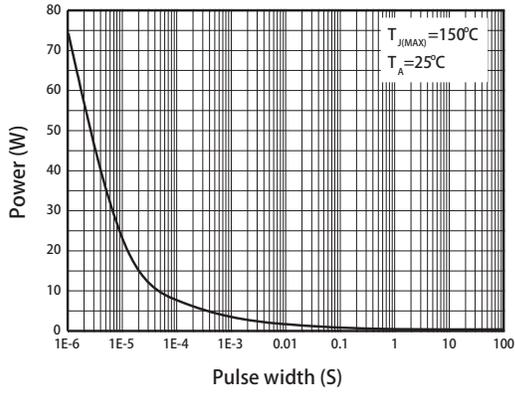
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



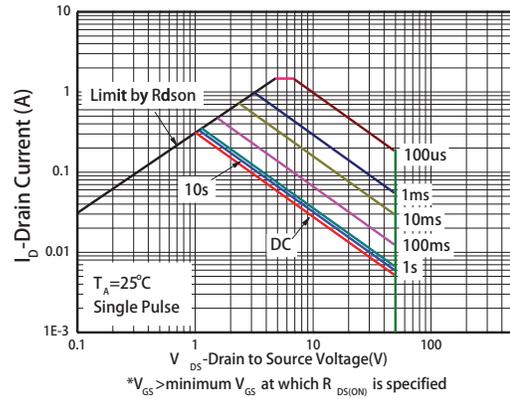
Capacitance



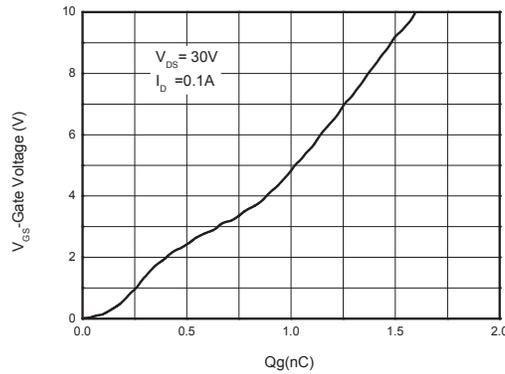
Body diode forward voltage



Single pulse power

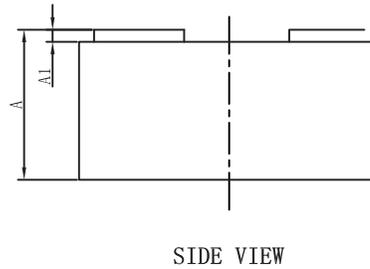
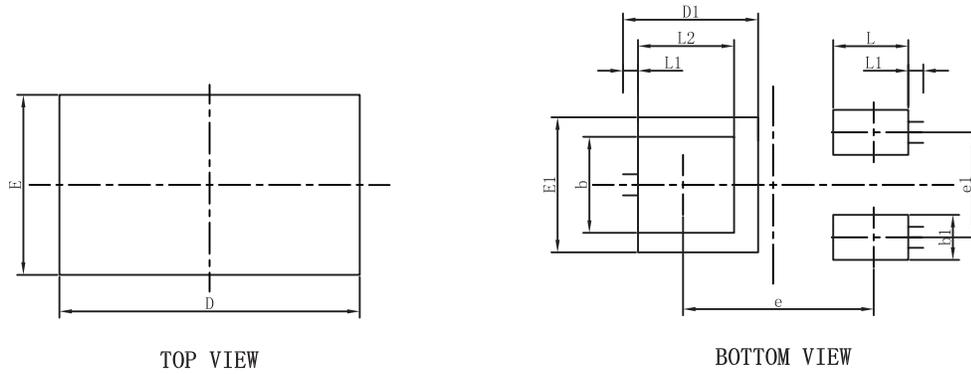


Safe operating power



Gate charge Characteristics

DFN1006-3L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	0.400	0.500	0.600
A1	0.000	0.050	0.150
D	0.850	1.000	1.150
E	0.450	0.600	0.750
D1	0.450REF		
E1	0.450REF		
b	0.200	0.350	0.600
b1	0.050	0.150	0.250
e	0.635REF		
e1	0.200	0.300	0.500
L	0.150	0.250	0.350
L1	0.050REF		
L2	0.150	0.300	0.400

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