Dual N-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (mΩ)(Typ.)	I_D (A)[a]	Q_g (Typ.)
20	450 at V_{GS} = 4.5 V	0.6	0.8 nC
	550 at V_{GS} = 2.5 V		

FEATURES

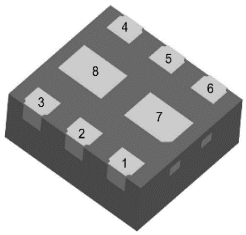
- DT-Trench Power MOSFET
- RoHS Compliant
- Halogen Free

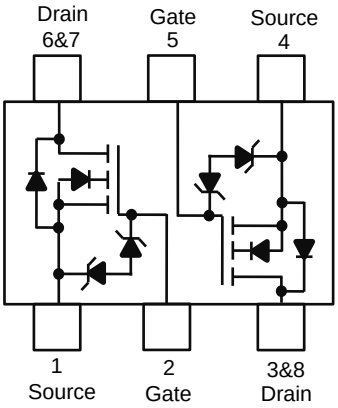
APPLICATIONS

- Relay Driver
- High-Speed Line Driver
- Low-Side Load Switch
- Switching Circuits

DFN1110-6A Pin Configuration

Top View





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_A = 25 °C	I_D	0.6	A
	T_A = 100 °C		0.4	
Pulsed Drain Current[b]		I_{DM}	2.5	
Maximum Power Dissipation[c]	T_A = 25 °C	P_D	0.25	W
	T_A = 100 °C		0.1	
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}	500	°C/W
Junction-to-Case (Drain)	R_{thJC}	300	

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.

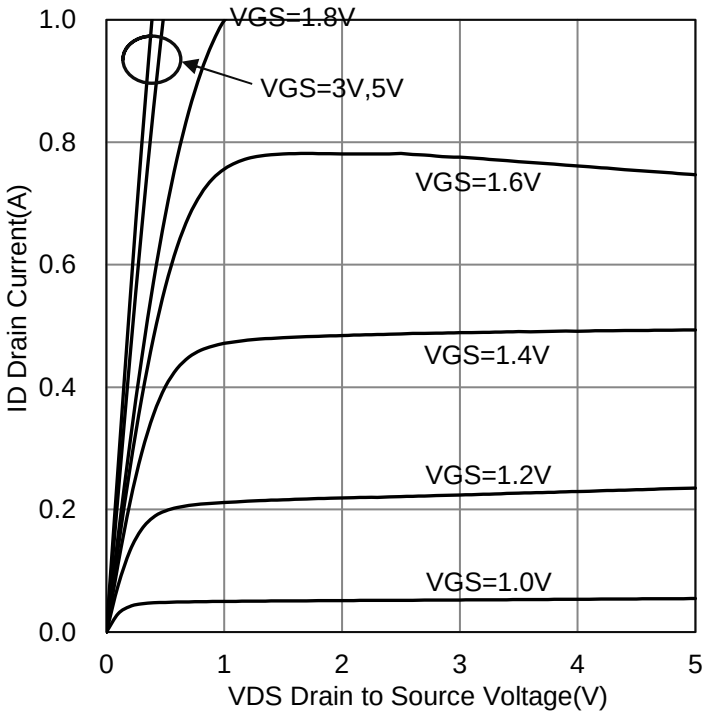
SPECIFICATIONS (T_A = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	0.5	-	1.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 8 V	-	-	± 10	µA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0 V	-	-	1	µA
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	0.6	-	-	A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 4.5 V, I_D = 0.5 A	-	450	600	mΩ
		V_{GS} = 2.5 V, I_D = 0.2 A	-	550	800	
		V_{GS} = 1.8 V, I_D = 0.1 A	-	750	1200	
		V_{GS} = 1.5 V, I_D = 0.05 A	-	1200	-	
		V_{GS} = 1.2 V, I_D = 0.02 A	-	2500	-	
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 10 V, f = 1 MHz	-	60	-	pF
Output Capacitance	C_{oss}		-	9.3	-	
Reverse Transfer Capacitance	C_{rss}		-	7.3	-	
Total Gate Charge[c]	Q_g	V_{DS} = 10 V, V_{GS} = 4.5 V, I_D = 0.6 A	-	0.8	-	nC
Gate-Source Charge[c]	Q_{gs}		-	0.11	-	
Gate-Drain Charge[c]	Q_{gd}		-	0.29	-	
Gate Resistance	R_g	f = 1 MHz	-	90	-	Ω
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 10 V, R_L = 20 Ω, R_{GEN} = 6.2 Ω, V_{GS} = 4.5 V, I_D = 0.5 A	-	4.2	-	ns
Rise Time[c]	t_r		-	3.4	-	
Turn-Off Delay Time[c]	$t_{d(off)}$		-	25.8	-	
Fall Time[c]	t_f		-	10.6	-	
Drain-Source Body Diode Ratings and Characteristics[b] (T_A = 25 °C)						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C	-	-	0.6	A
Pulsed Current	I_{SM}		-	-	2.5	A
Forward Voltage[a]	V_{SD}	I_F = 0.5 A, V_{GS} = 0 V	-	0.8	1.3	V

Notes

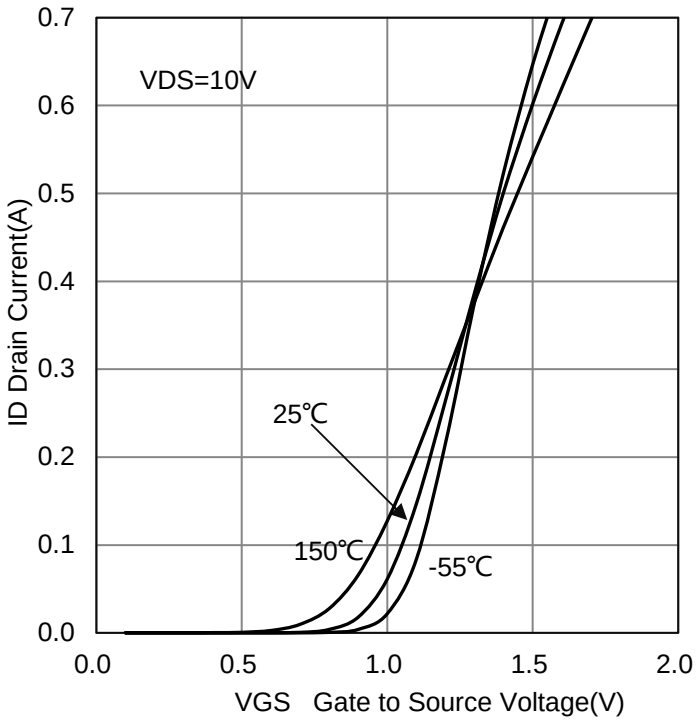
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

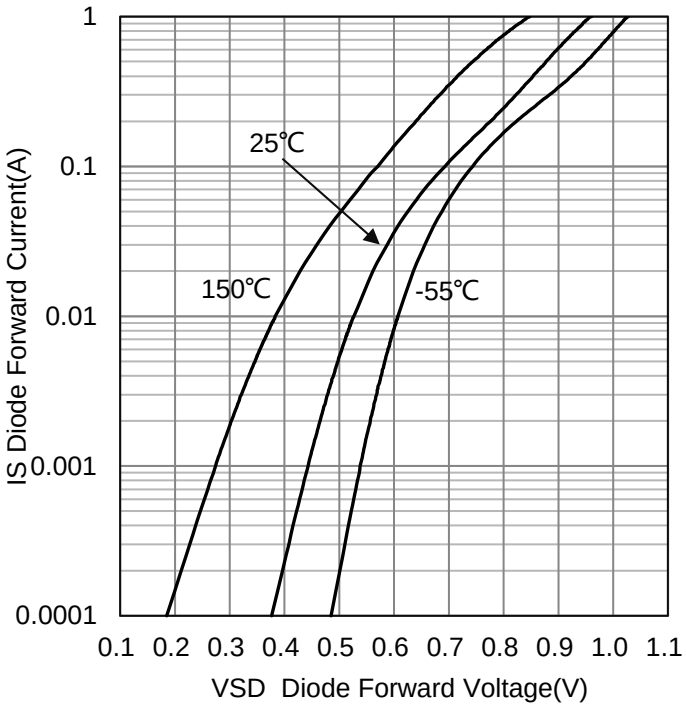
TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)



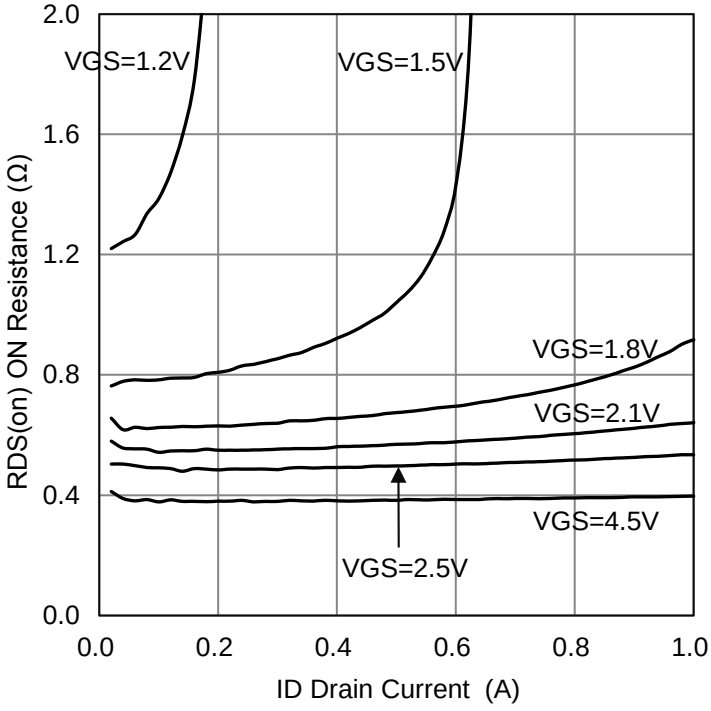
ID vs. VDS



ID vs. VGS

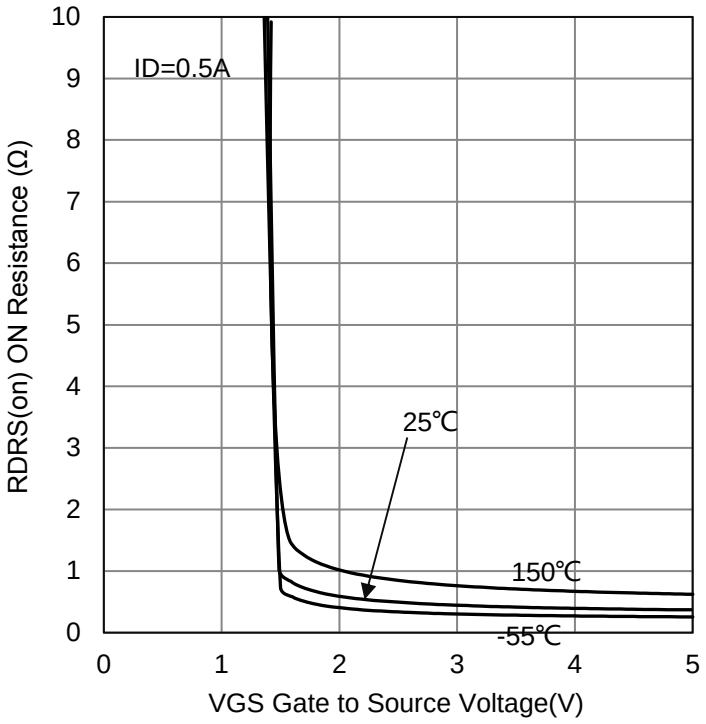


IS vs. VSD

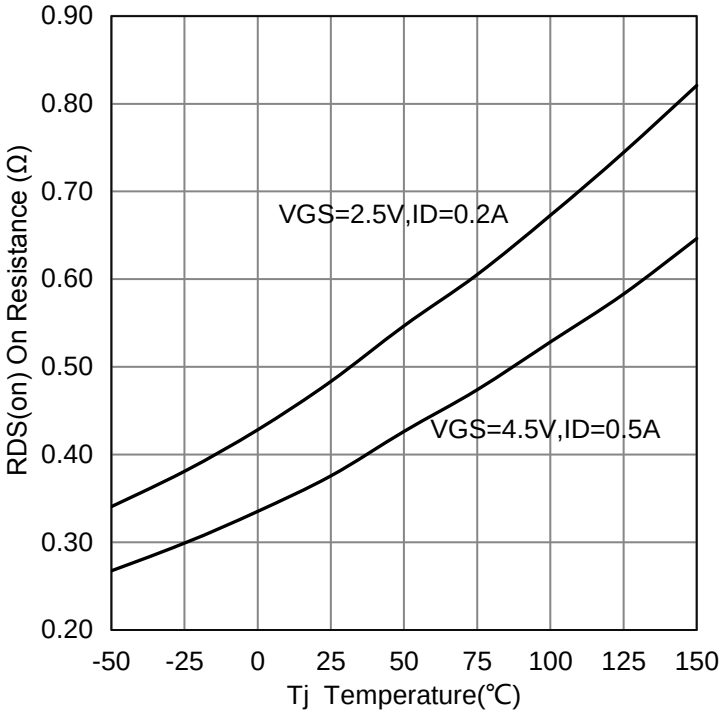


RDS(on) vs. ID

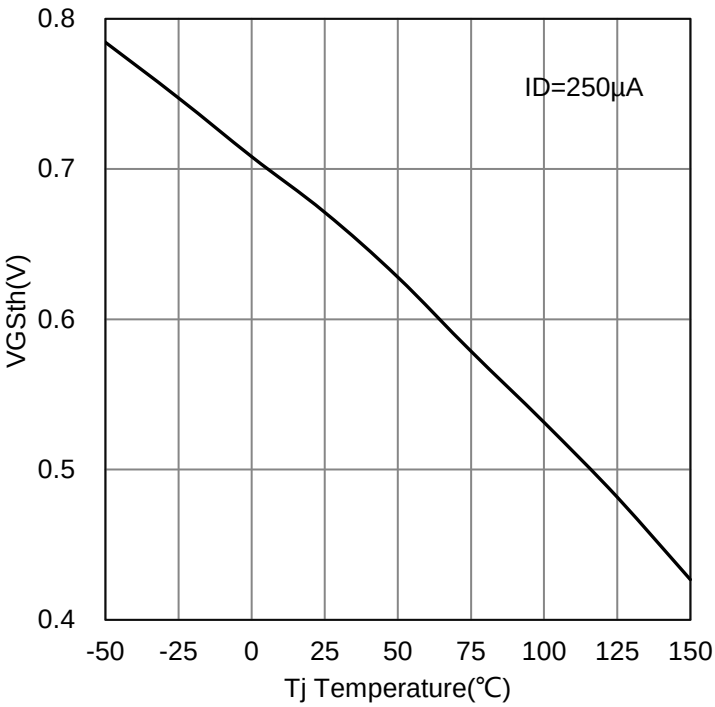
TYPICAL CHARAC TERISTICS (25 °C, unless otherwise noted)



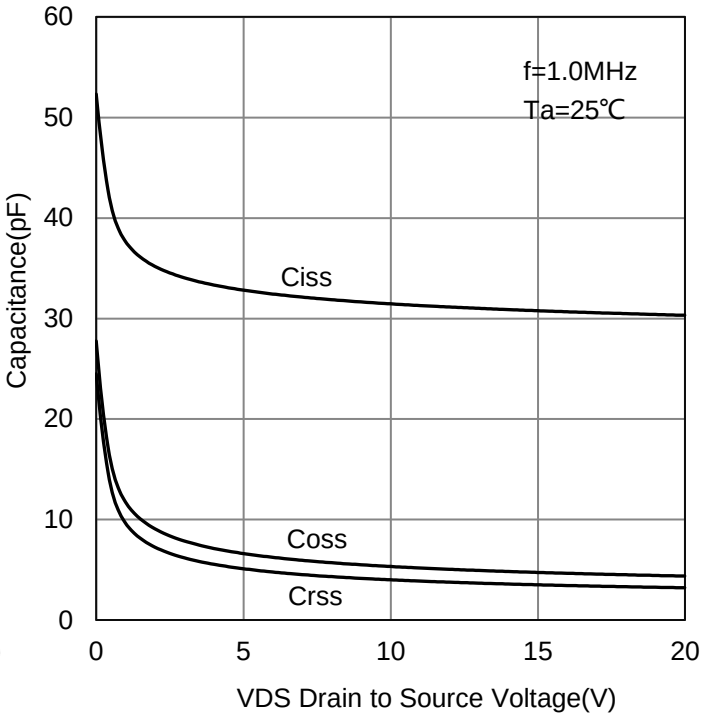
RDS(on) vs. VGS



RDS(on) vs. Tj

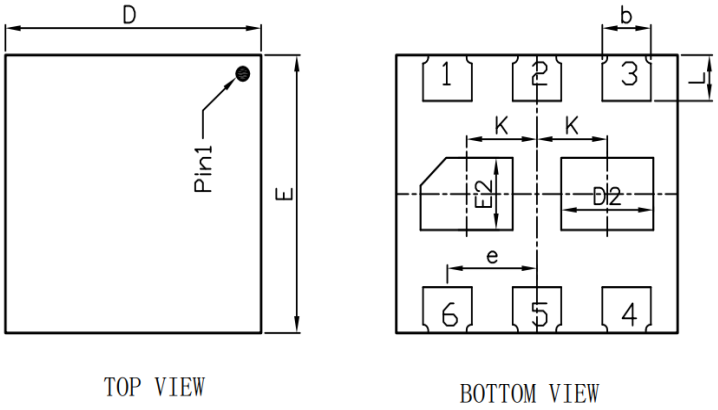


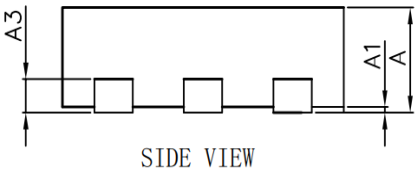
VGSth vs. Tj



Capacitance

DFN1110-6A PACKAGE OUTLINE





COMMON DIMENSIONS
UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	0.34	0.37	0.40
A1	0.01	0.02	0.04
b	0.15	0.19	0.23
L	0.125	0.165	0.205
D	1.05	1.10	1.15
E	0.95	1.00	1.05
D2	0.32	0.36	0.40
E2	0.22	0.26	0.30
e	0.35		
A3	0.127 REF		
K	0.275		

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Din-Tek Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Din-Tek"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Din-Tek makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Din-Tek disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Din-Tek's knowledge of typical requirements that are often placed on Din-Tek products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Din-Tek's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Din-Tek products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Din-Tek product could result in personal injury or death. Customers using or selling Din-Tek products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Din-Tek personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Din-Tek. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Din-Tek Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Din-Tek documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Din-Tek Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Din-Tek documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.