

Features

- **N-Channel**

$V_{DS}=20V, I_D=5A$

$R_{DS(on)} < 28m\Omega @ V_{GS}=4.5V$

$R_{DS(on)} < 35m\Omega @ V_{GS}=2.5V$

- **P-Channel**

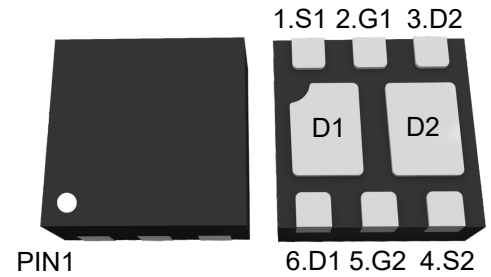
$V_{DS}=-20V, I_D=-5A$

$R_{DS(on)} < 45m\Omega @ V_{GS}=-4.5V$

$R_{DS(on)} < 70m\Omega @ V_{GS}=-2.5V$

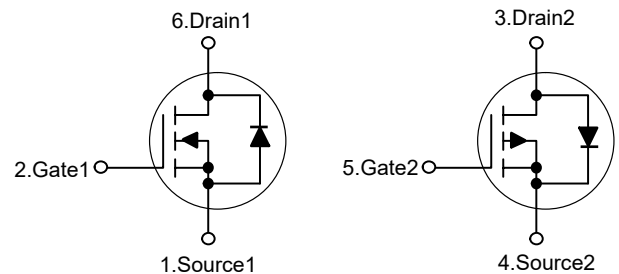
- Very fast switching
- Trench MOSFET technology

DFN2x2A-6L



Marking Code: 2005

Schematic Diagram



Applications

- Switching
- DC/DC Converter

Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	± 12	± 12	V
Drain Current-Continuous	I_D	+5	-5	A
Drain Current-Pulsed ^{Note1}	I_{DM}	20	-20	A
Maximum Power Dissipation	P_D	1.2		W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	150, -55~150		°C

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient ^{Note2}	$R_{\theta JA}$	104	°C/W
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N-Channel

Electrical Characteristics

(T_a=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	20	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage ^{Note3}	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.7	1.0	V
Drain-Source On-Resistance ^{Note3}	R _{DS(on)}	V _{GS} =4.5V, I _D =4.5A	--	--	28	mΩ
		V _{GS} =2.5V, I _D =4A	--	--	35	mΩ
Forward Transconductance ^{Note3}	g _{FS}	V _{DS} =15V, I _D =5A	--	25	--	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =8V, V _{GS} =0V, f=1MHz	--	500	--	pF
Output Capacitance	C _{oss}		--	295	--	pF
Reverse Transfer Capacitance	C _{rss}		--	96	--	pF
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =10V, I _D =1A V _{GS} =4.5V, R _{GEN} =6Ω	--	11	--	nS
Turn-on Rise Time	t _r		--	30	--	nS
Turn-off Delay Time	t _{d(off)}		--	35	--	nS
Turn-off Fall Time	t _f		--	10	--	nS
Total Gate Charge	Q _g	V _{DS} =10V, I _D =3A, V _{GS} =4.5V	--	10	--	nC
Gate-Source Charge	Q _{gs}		--	2.3	--	nC
Gate-Drain Charge	Q _{gd}		--	2.9	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	V _{SD}	V _{GS} =0V, I _S =5A	--	--	1.2	V
Diode Forward Current ^{Note2}	I _S		--	--	5	A

P-Channel**Electrical Characteristics**(T_a=25°C unless otherwise specified)

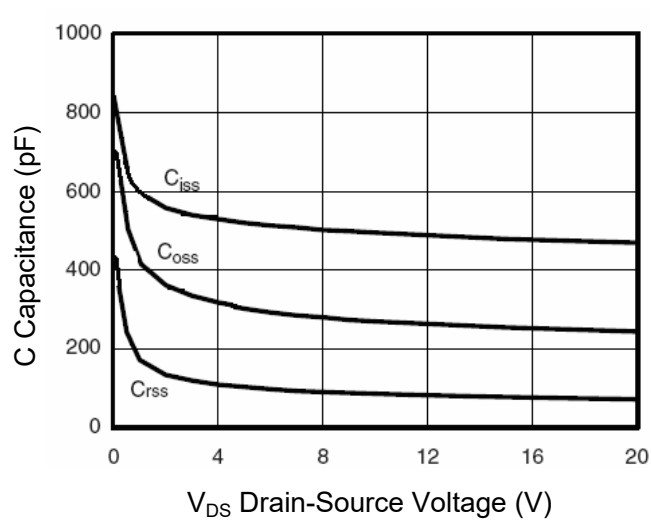
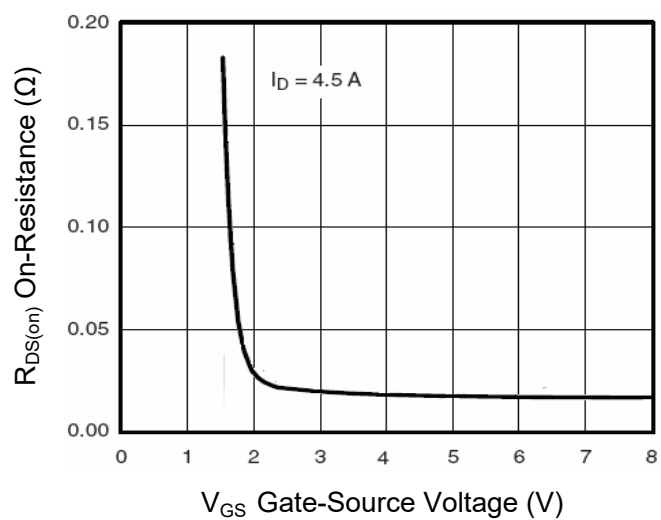
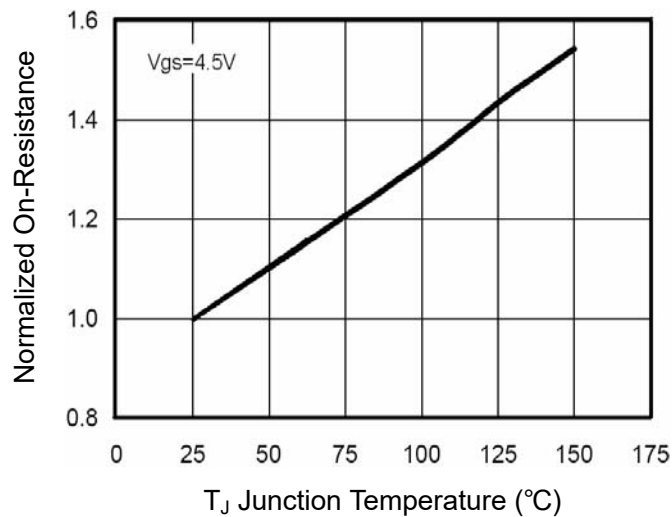
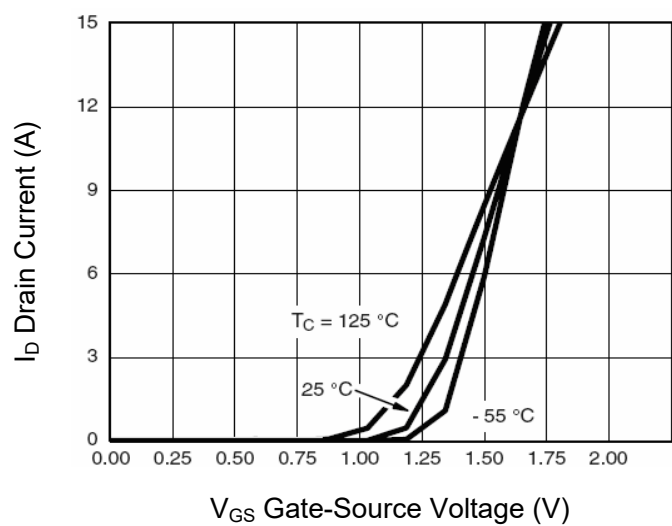
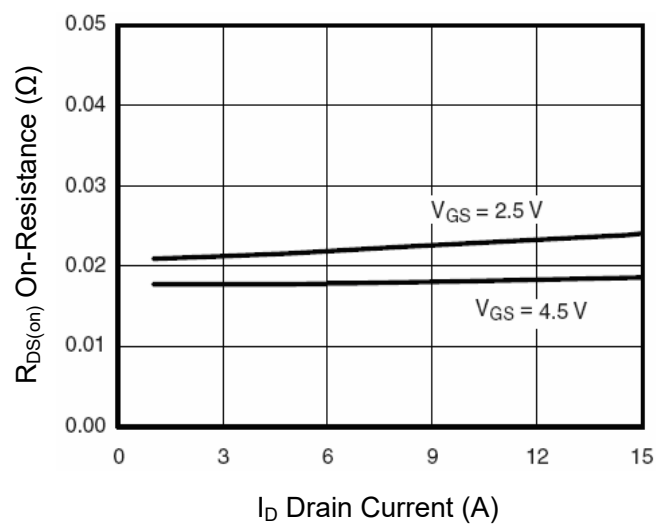
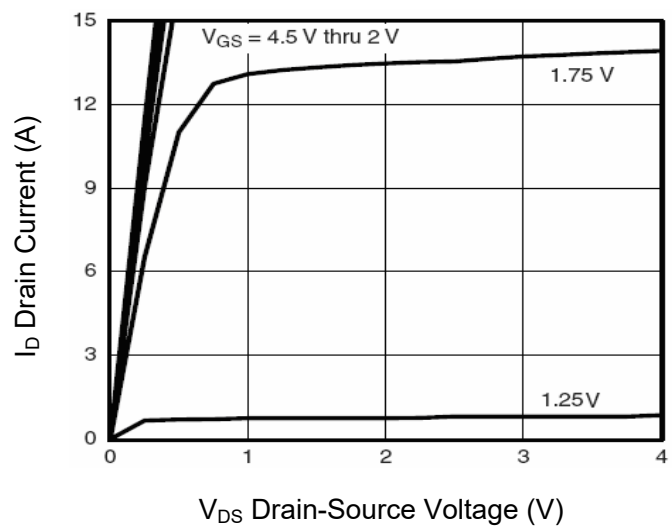
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$-V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	20	--	--	V
Zero Gate Voltage Drain Current	$-I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	--	--	± 100	nA
Gate Threshold Voltage ^{Note3}	$-V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	0.5	0.7	0.9	V
Drain-Source On-Resistance ^{Note3}	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-4.1A$	--	--	45	m Ω
		$V_{GS}=-2.5V, I_D=-3A$	--	--	70	m Ω
Forward Transconductance ^{Note3}	g_{FS}	$V_{DS}=-5V, I_D=-4.1A$	--	6	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=-4V, V_{GS}=0V, f=1MHz$	--	740	--	pF
Output Capacitance	C_{oss}		--	290	--	pF
Reverse Transfer Capacitance	C_{rss}		--	190	--	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-4V, R_L=1.2\Omega$ $V_{GS}=-4.5V, R_{GEN}=1\Omega$	--	12	--	nS
Turn-on Rise Time	t_r		--	35	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	30	--	nS
Turn-off Fall Time	t_f		--	10	--	nS
Total Gate Charge	Q_g	$V_{DS}=-4V, I_D=-4.1A,$ $V_{GS}=-4.5V$	--	7.8	--	nC
Gate-Source Charge	Q_{gs}		--	1.2	--	nC
Gate-Drain Charge	Q_{gd}		--	1.6	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	$-V_{SD}$	$V_{GS}=0V, I_S=-5A$	--	--	1.2	V
Diode Forward Current ^{Note2}	$-I_S$		--	--	5	A

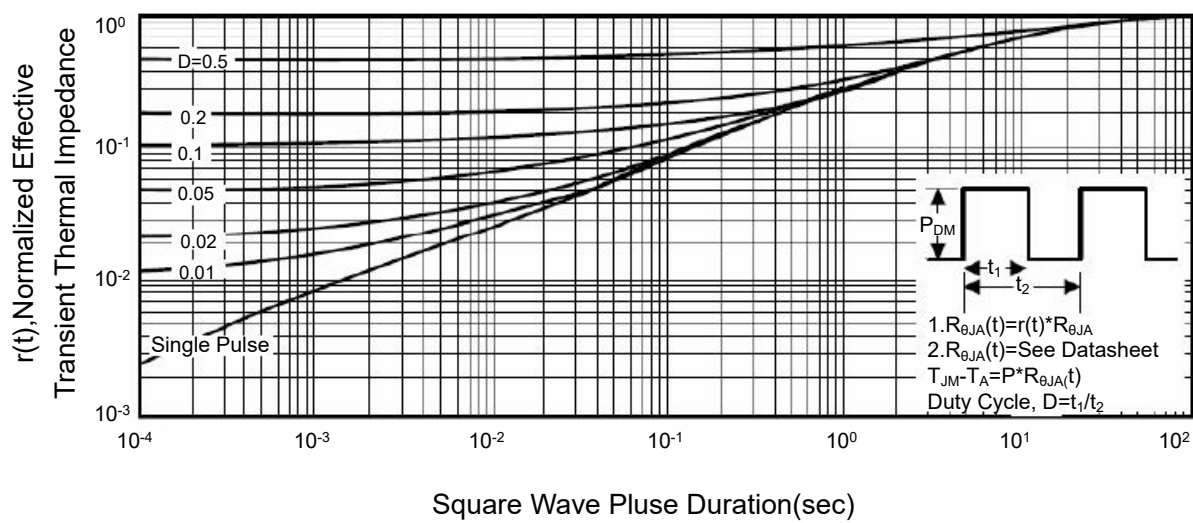
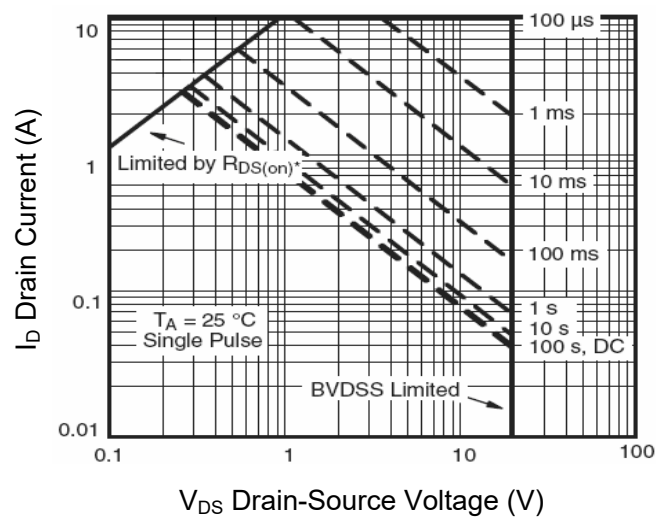
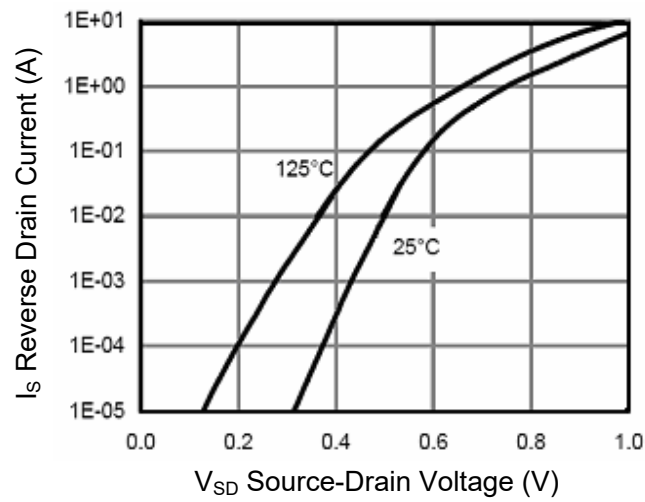
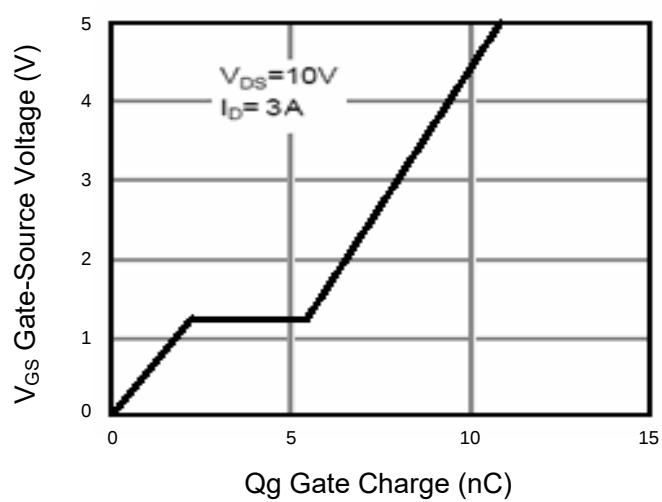
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, $t \leq 10$ sec.3. Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

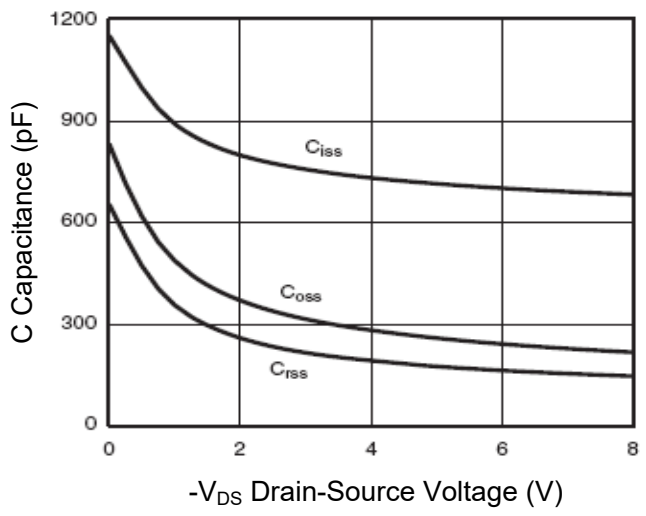
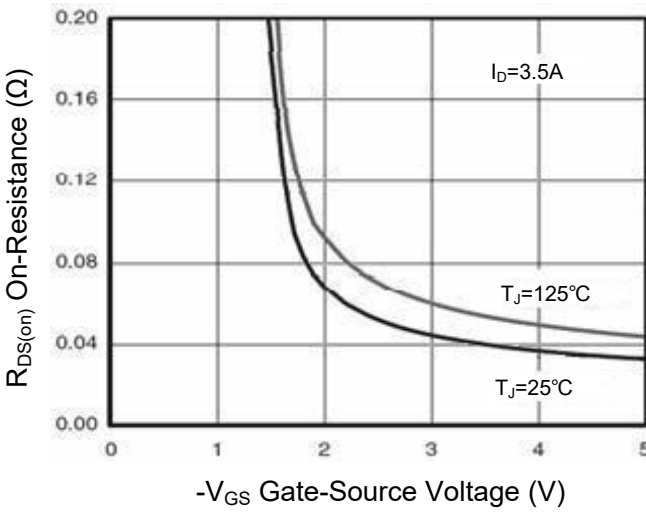
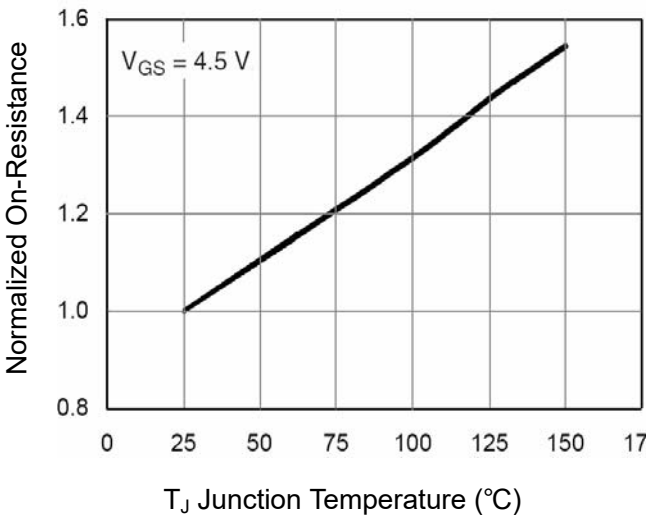
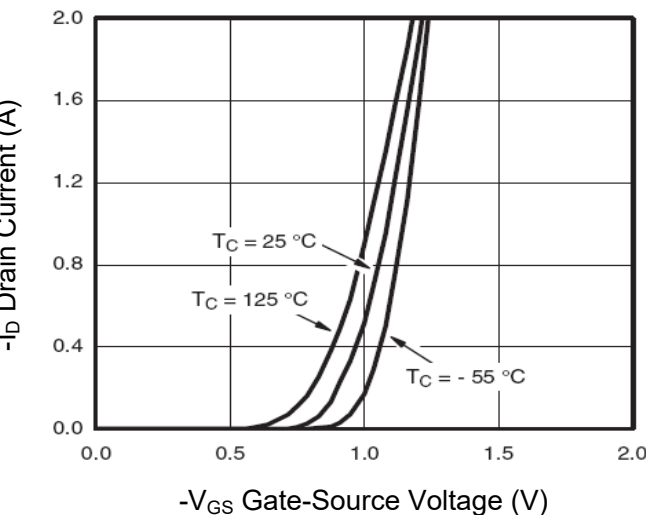
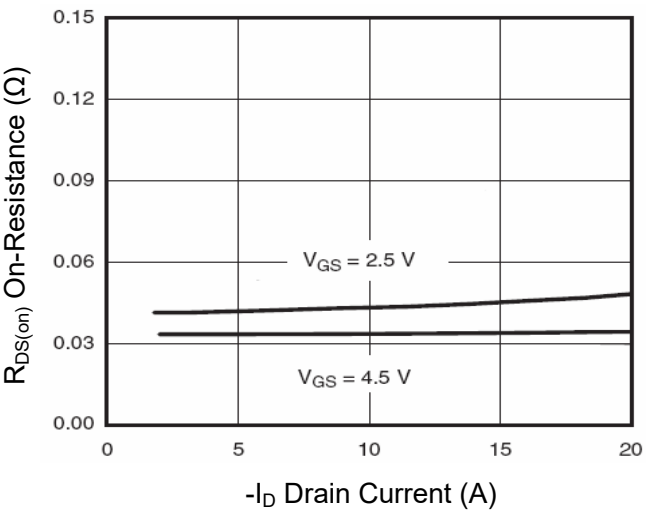
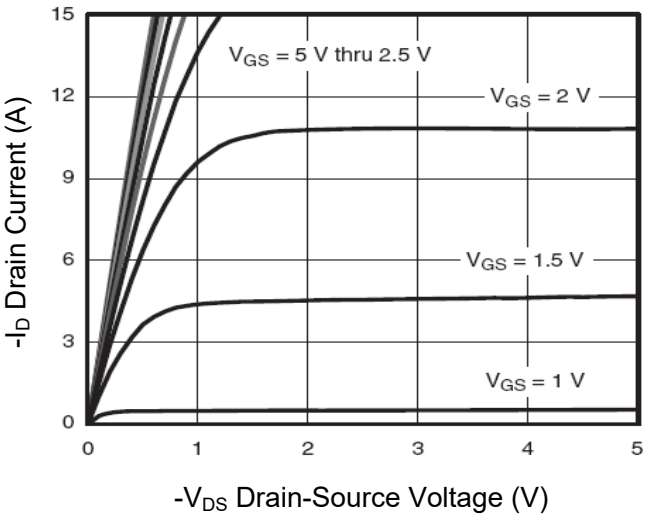
N-Channel

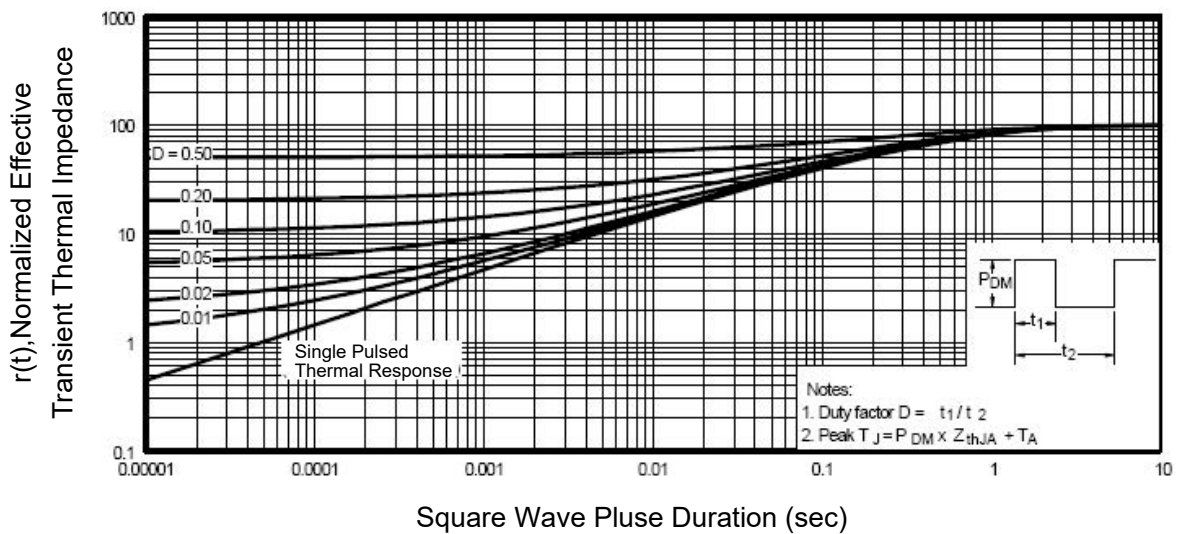
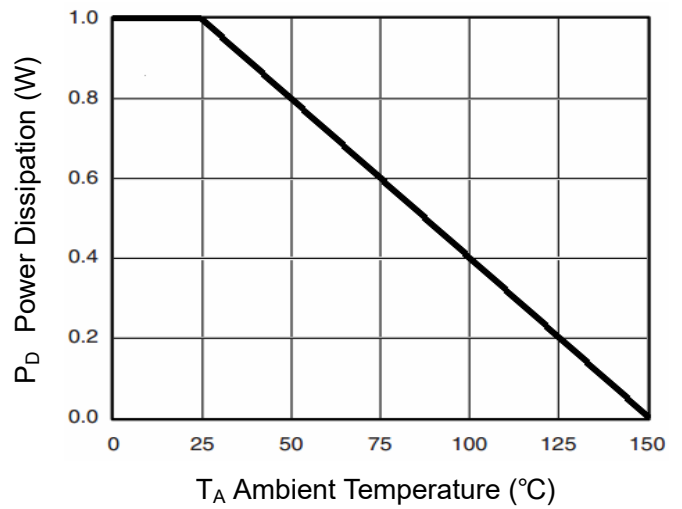
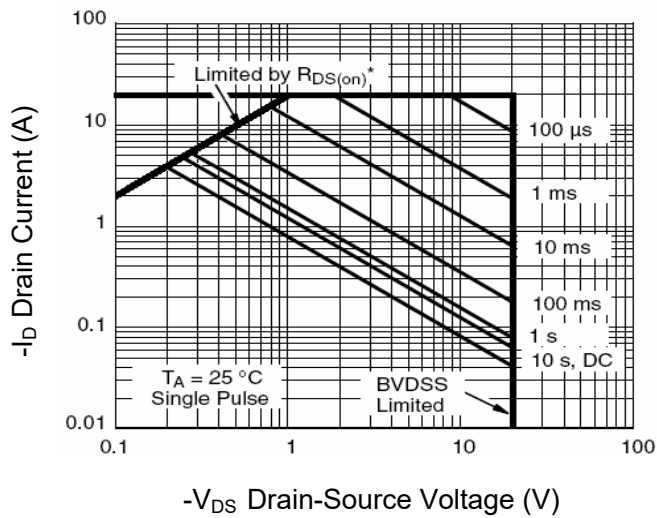
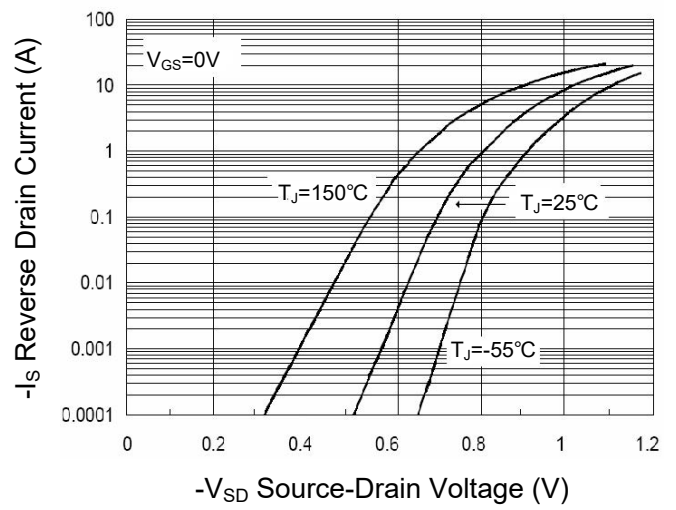
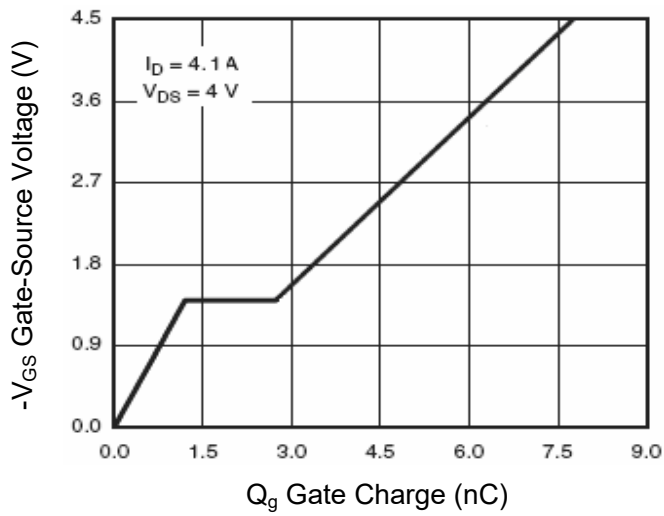
Electrical Characteristics Curves





P-Channel
Electrical Characteristics Curves

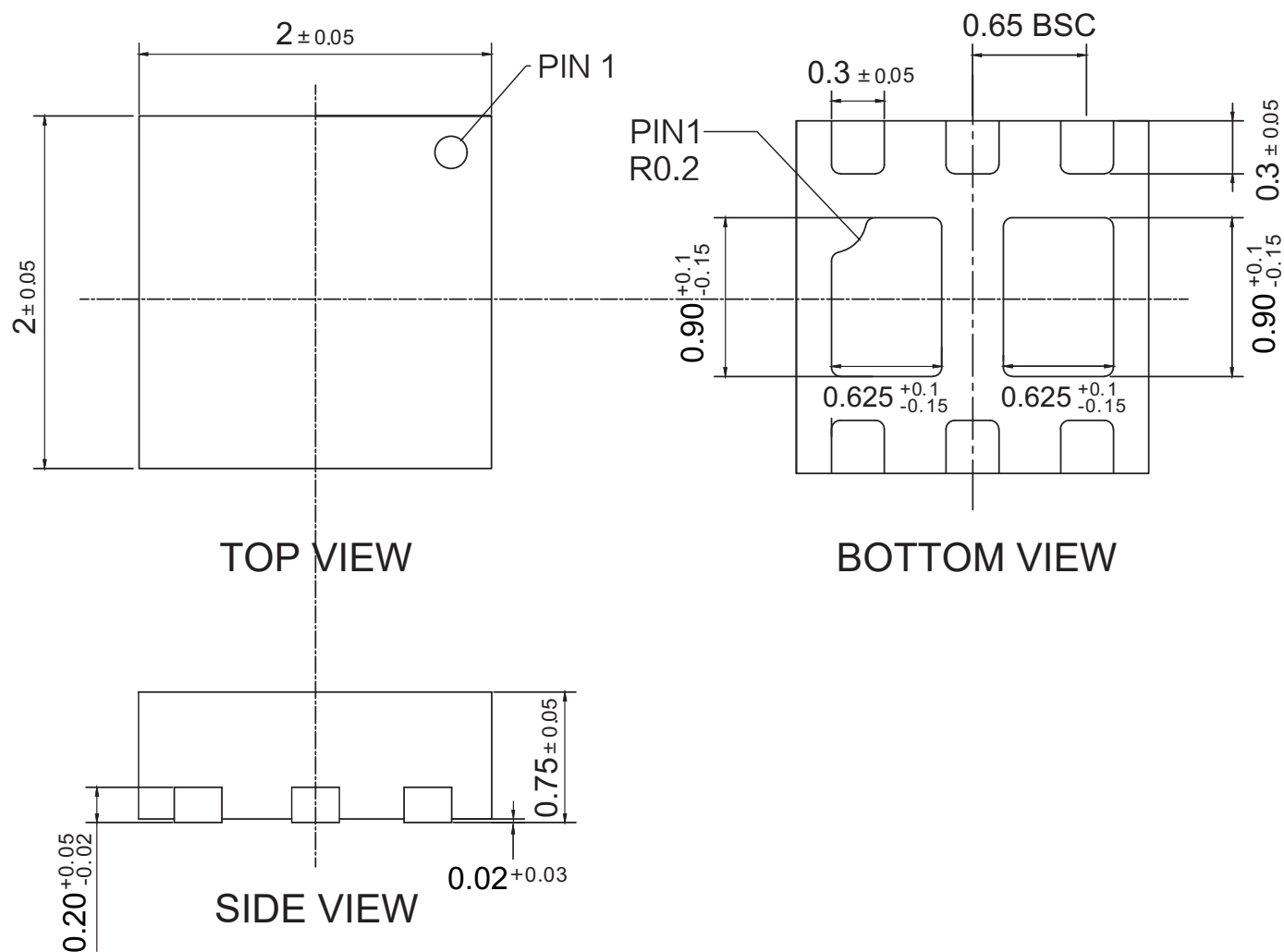




Package Outline

DFN2x2-6L-0002

Dimensions in mm



Ordering Information

Device	Package	Shipping
TN05C20DFA	DFN2x2A-6L	3,000PCS/Reel&7inches

Contact Information

TANI website: <http://www.tanisemi.com> Email:tani@tanisemi.com

For additional information, please contact your local Sales Representative.

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