

TN06C20DFA

N and P-Channel Complementary Power MOSFET

Product Summary

- **N-Channel**
- $V_{DS} = 20V, I_D = 6A$
- $R_{DS(on)} < 30m\Omega @ V_{GS} = 4.5V$
- $R_{DS(on)} < 36m\Omega @ V_{GS} = 2.5V$
- $R_{DS(on)} < 42m\Omega @ V_{GS} = 1.8V$
- **P-Channel**
- $V_{DS} = -20V, I_D = -5A$
- $R_{DS(on)} < 55m\Omega @ V_{GS} = -4.5V$
- $R_{DS(on)} < 78m\Omega @ V_{GS} = -2.5V$
- $R_{DS(on)} < 90m\Omega @ V_{GS} = -1.8V$

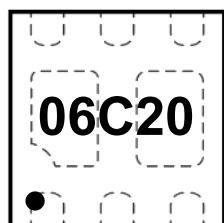
Features

- Advanced Trench Technology
- RoHS and Reach Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 1

Application

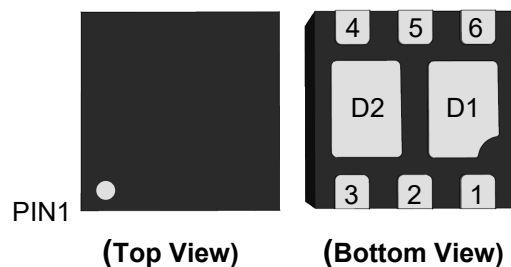
- Switching
- DC/DC Converter

Marking Code



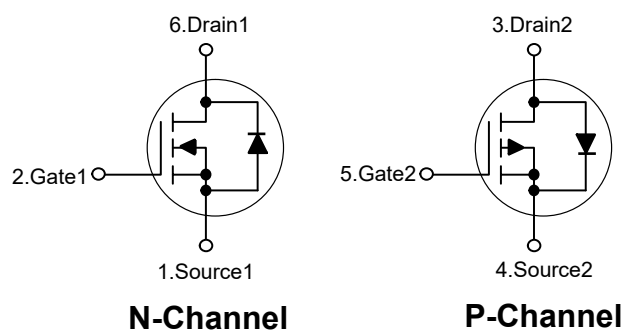
Top View

DFN2x2A-6L



Pin	Description	Pin	Description
1	Source1	4	Source2
2	Gate1	5	Gate2
3	Drain2	6	Drain1

Schematic Diagram



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	6	-5	A
Drain Current-Pulsed ^{Note1}	I_{DM}	40	-25	A
Maximum Power Dissipation	P_D	1.2		W
Junction Temperature	T_J	150		°C
Storage Temperature Range	T_{STG}	-55 to +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	--	1.0	V
Drain-Source On-Resistance ^{Note3}	R _{DS(on)}	V _{GS} =4.5V, I _D =5.5A	--	--	30	mΩ
		V _{GS} =2.5V, I _D =5A	--	--	36	mΩ
		V _{GS} =1.8V, I _D =3A	--	--	42	mΩ
Forward Transconductance ^{Note3}	g _{FS}	V _{DS} =5V, I _D =1A	--	5.5	--	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
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
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
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	V _{SD}	V _{GS} =0V, I _S =6A	--	--	1.2	V
Diode Forward Current ^{Note2}	I _S		--	--	6	A

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

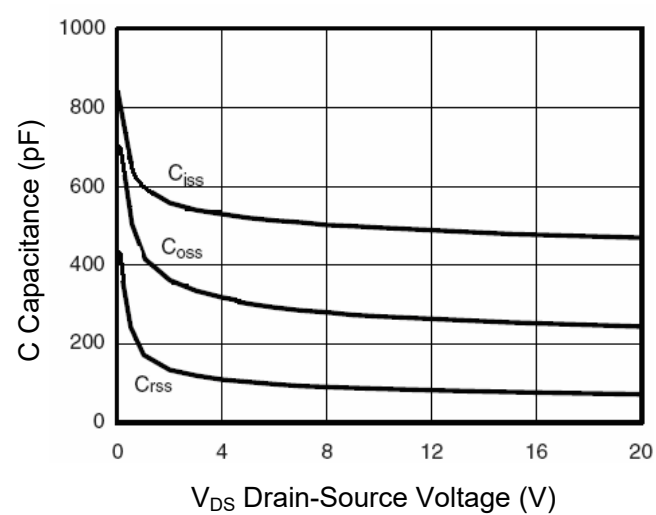
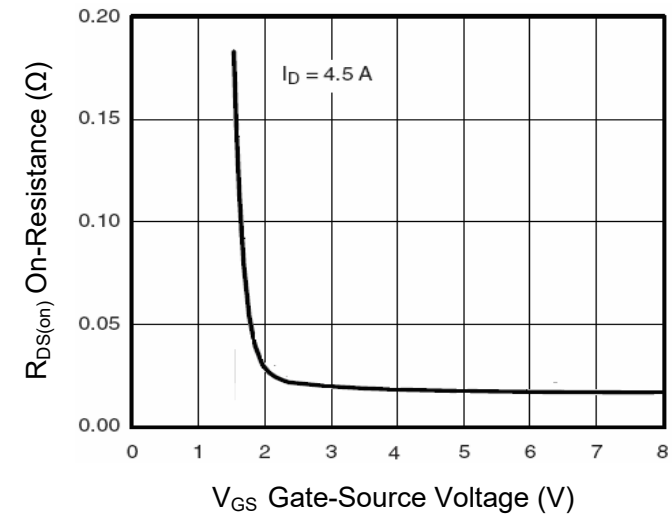
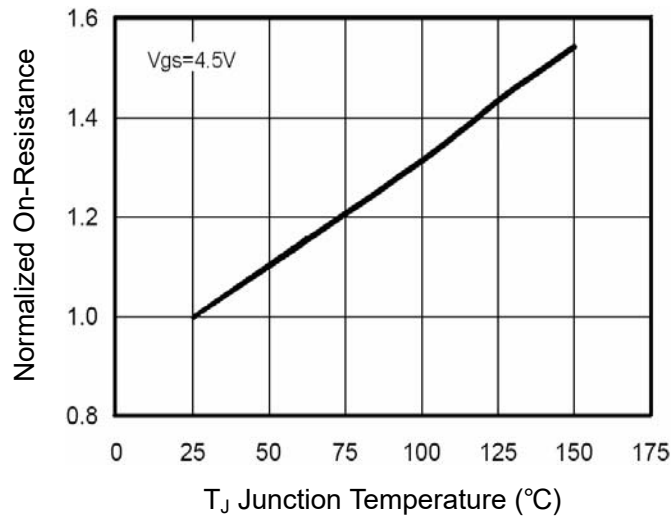
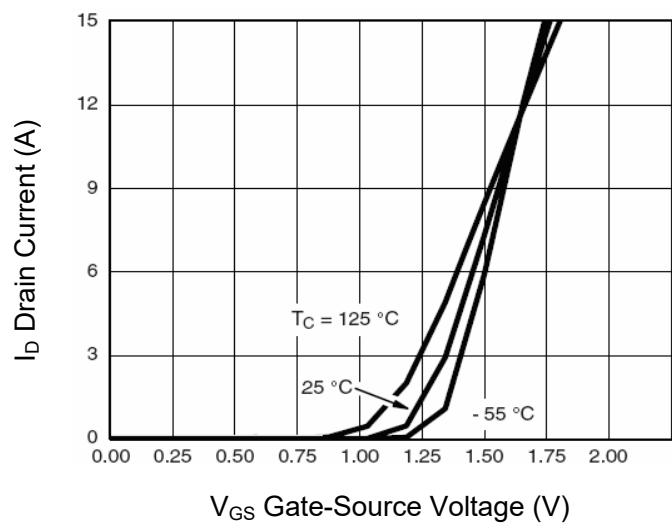
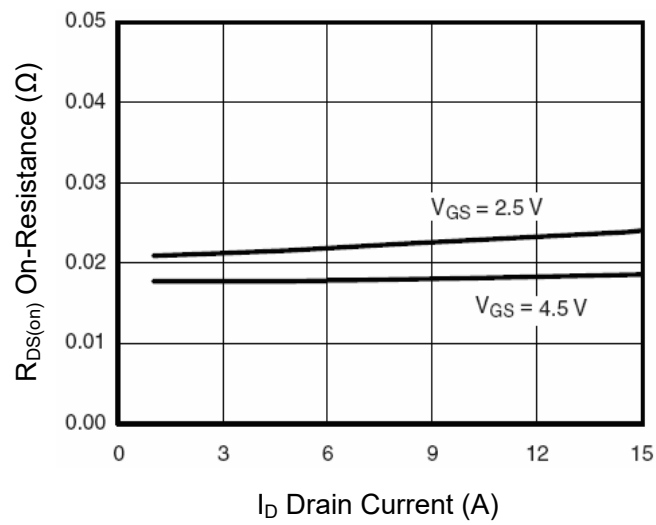
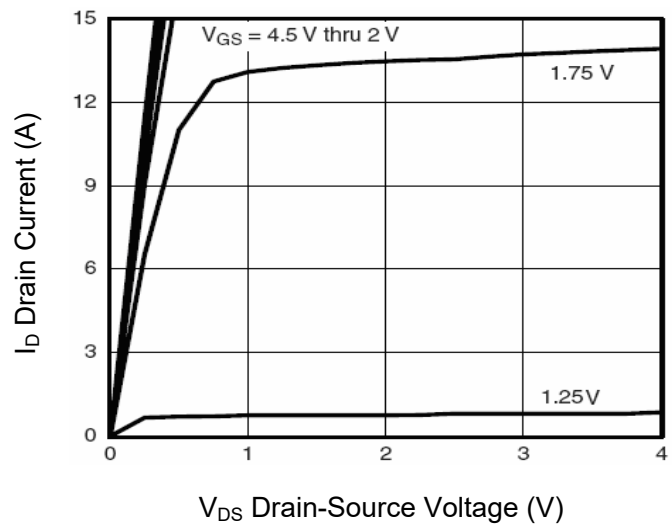
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	-V _{(BR)DSS}	V _{GS} =0V, I _D =-250μA	20	--	--	V
Zero Gate Voltage Drain Current	-I _{DSS}	V _{DS} =-20V, V _{GS} =0V	--	--	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	--	--	±100	nA
Gate Threshold Voltage ^{Note3}	-V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	0.5	--	0.9	V
Drain-Source On-Resistance ^{Note3}	R _{DS(on)}	V _{GS} =-4.5V, I _D =-4.1A	--	--	55	mΩ
		V _{GS} =-2.5V, I _D =-3.5A	--	--	78	mΩ
		V _{GS} =-1.8V, I _D =-1.5A	--	--	90	mΩ
Forward Transconductance ^{Note3}	g _{FS}	V _{DS} =-5V, I _D =-1A	--	5.5	--	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
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
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-4V, R _L =1.2Ω, V _{GS} =-4.5V, R _{GEN} =1Ω	--	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
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

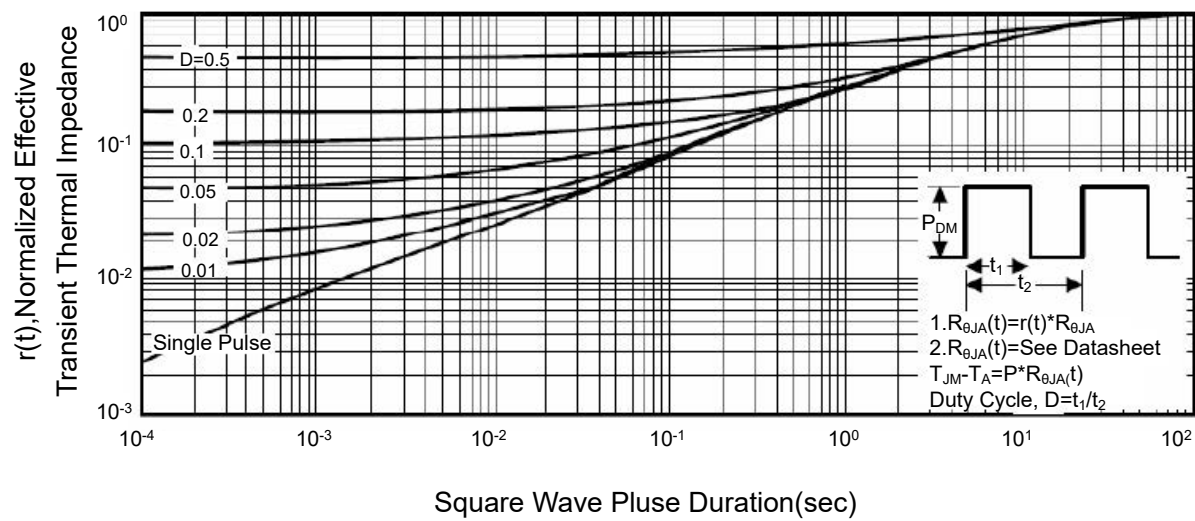
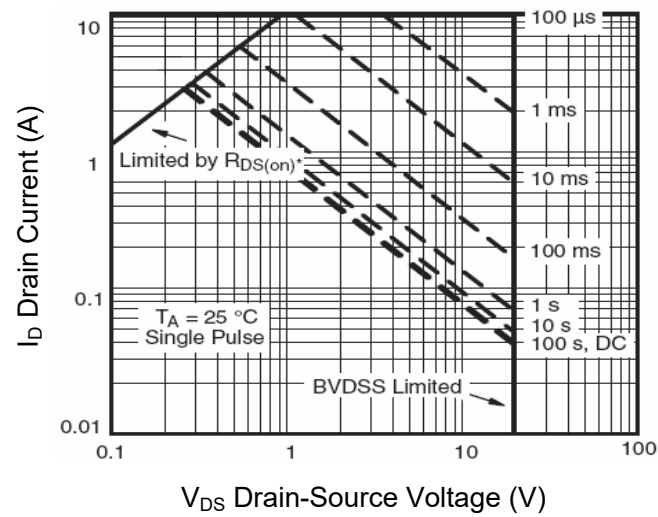
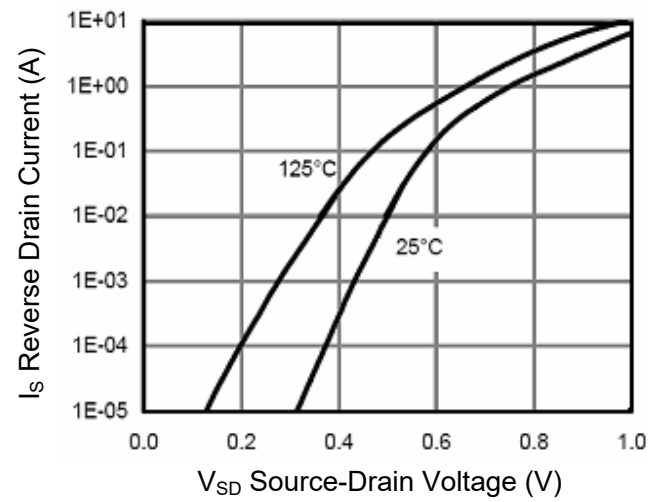
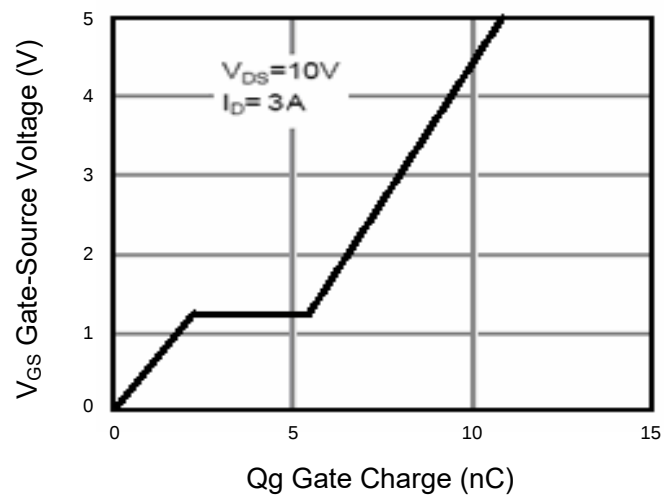
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

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

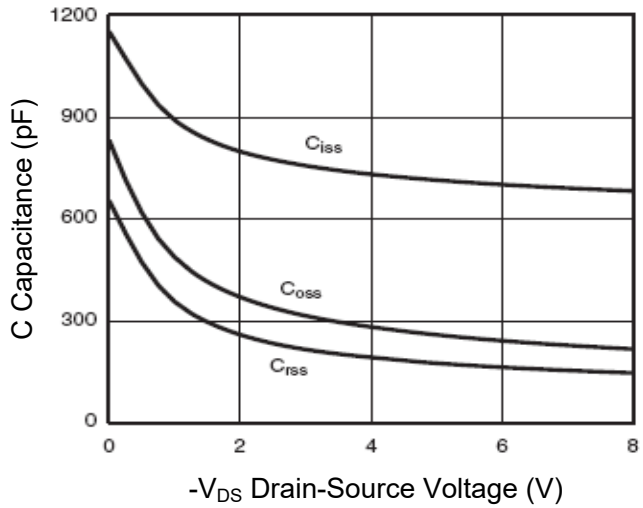
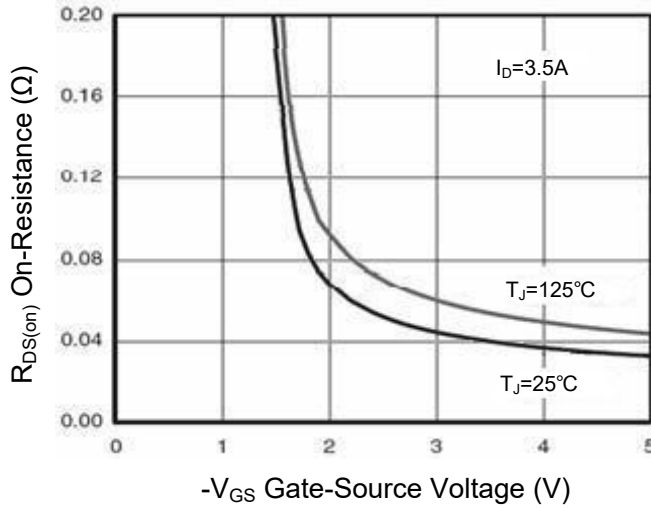
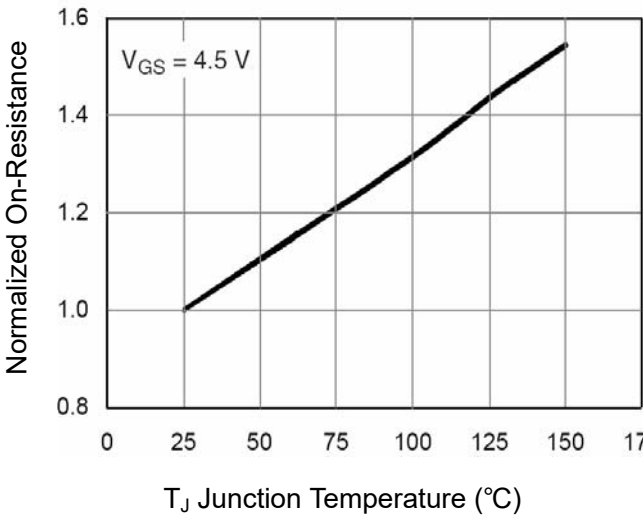
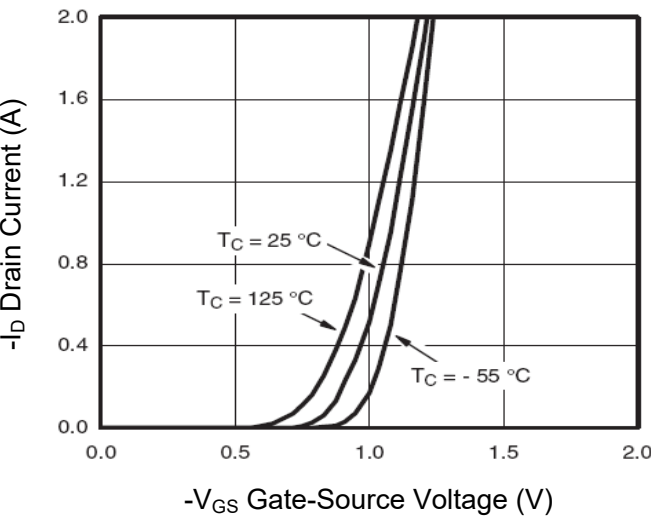
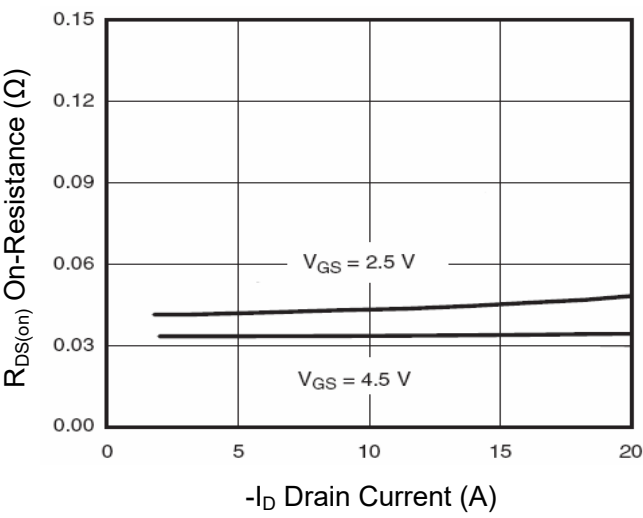
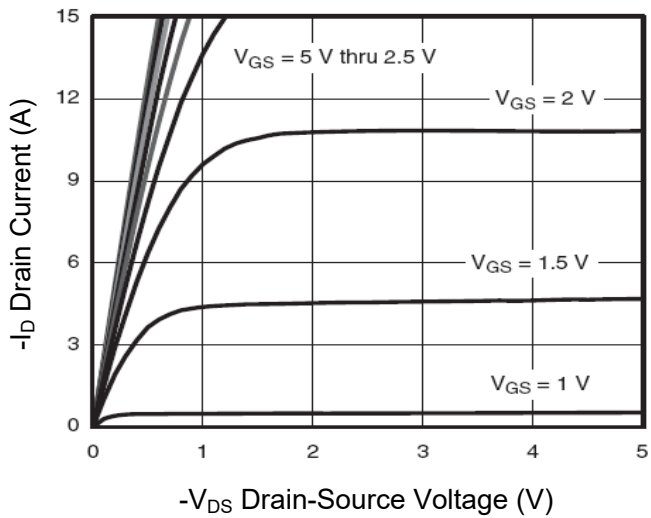
N-Channel

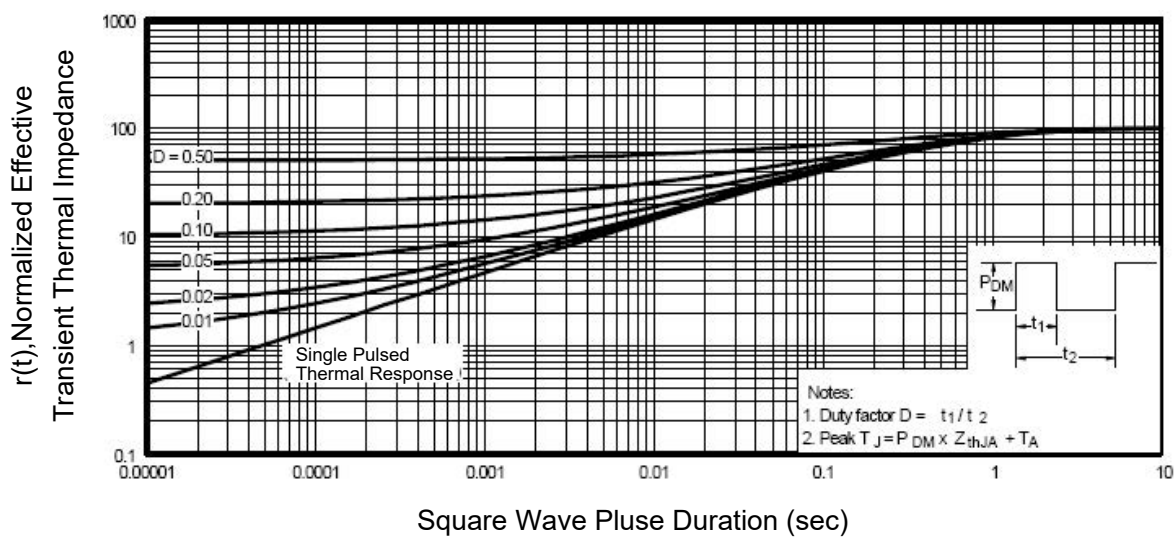
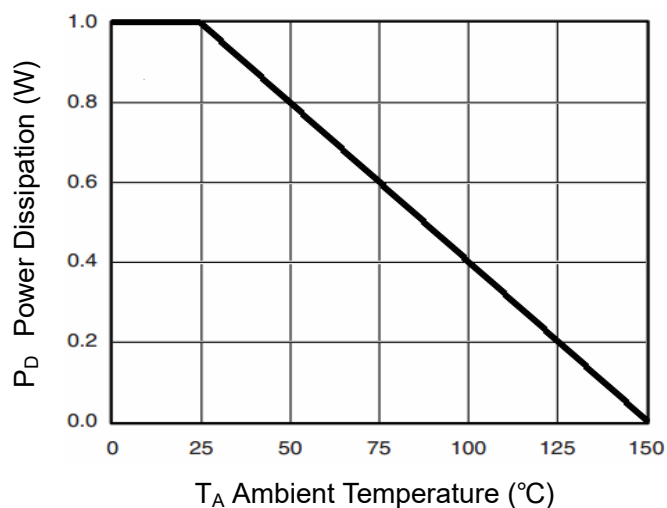
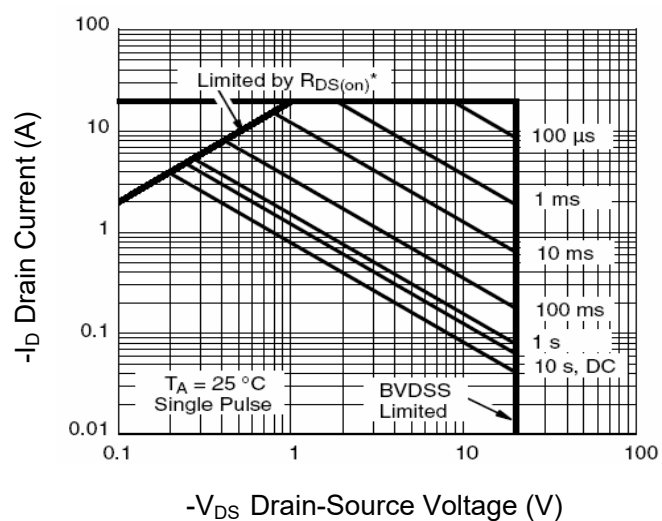
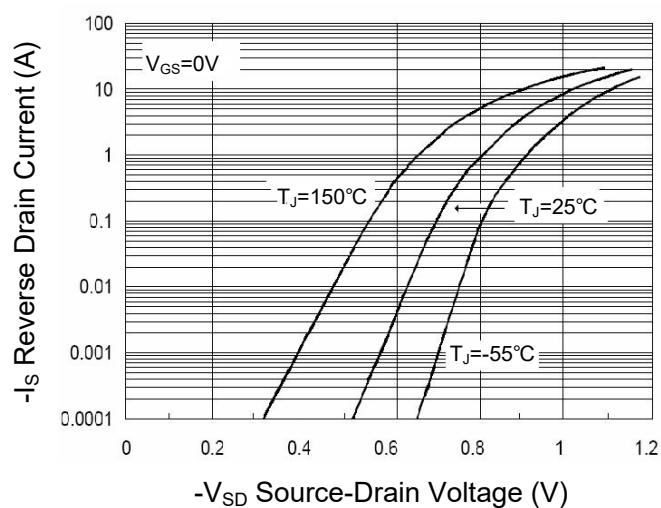
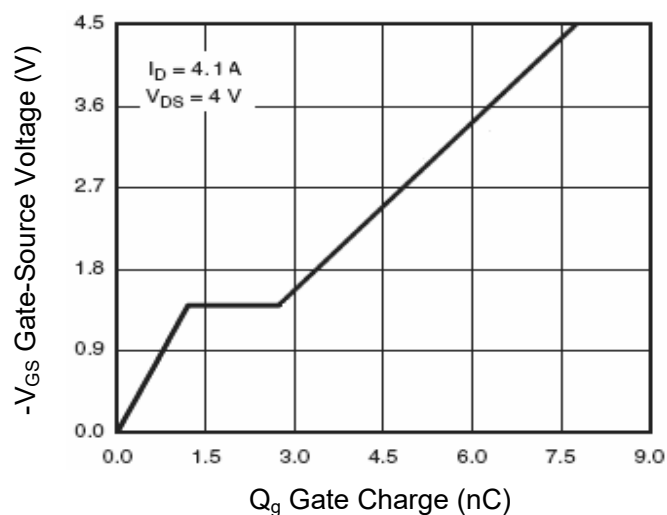
Electrical Characteristics Curves





P-Channel
Electrical Characteristics Curves





Contact Information

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For additional information, please contact your local Sales Representative.



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