General Description

The WSD3810DN is the highest performance trench Dual N-Ch MOSFET with extreme high cell density,which provide excellent R_{DSON} and gate charge for most of the synchronous buck converter applications .

The WSD3810DN meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

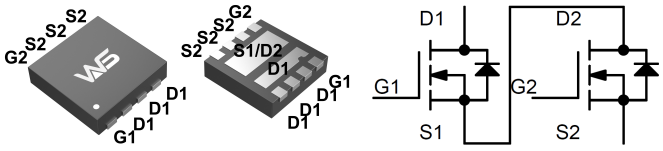
Product Summery

B_{VDSS}	R_{DSON}	I_D	ITEM
30V	10.8mΩ	18A	Q1
30V	10.5mΩ	18A	Q2

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

DFN3X3 Asymmetric Dual Pin Configuration



Absolute Maximum Ratings @TA=25℃ unless otherwise noted

Symbol	Parameter		Q1	Q2	Units
V_{DS}	Drain-Source Voltage		30	30	V
V_{GS}	Gate-Source Voltage		±20	±20	V
I_D	Drain Current (Continuous) *AC	T_C=25°C	18	18	A
		T_C=100°C	12.3	12.3	
I_{DM}	Drain Current (Pulse) *B		45	45	A
P_D	Power Dissipation	T_C=25°C	20	20	W
EAS	Single Pulse Avalanche Energy	VDD=25V,VGS=10V,L=1mH,RG=25Ω	11	11	mJ
$R_{\theta JC}$	Thermal Resistance Junction to Case		6	6	℃/W
T_J//T_{STG}	Operating Temperature/ Storage Temperature		-55~150	-55~150	℃

Q1 Electrical Characteristics @T_A=25℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30 V, V_{GS} = 0V			1	μA
I_{GSS}	Gate Leakage Current	V_{GS} = ±20V, V_{DS} = 0V			100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_{DS} = 250μA	1	1.6	2.5	V
$R_{DS(on)}$	Drain-Source On-state Resistance	V_{GS} = 10V, I_D = 10A		9	10.8	mΩ
		V_{GS} = 4.5V, I_D = 8A		12	17.5	mΩ
gFS	Forward Transconductance	V_{DS} = 5V, I_D= 5A		12		S
V_{SD}	Diode Forward Voltage	I_{SD} = 1A , V_{GS}=0V			1.3	V
Switching						
Qg	Total Gate Charge	V_{GS}=10V, V_{DS}=15V, I_D=5A		8		nC
Qgs	Gate-Source Charge			1.6		nC
Qgd	Gate-Drain Charge			1.2		nC
td (on)	Turn-on Delay Time	V_{GS}=10V, V_{DD}=15V, I_D=1A,R_G=6Ω		8.5		ns
tr	Turn-on Rise Time			10		ns
td(off)	Turn-off Delay Time			14		ns
tf	Turn-off Fall Time			10.6		ns
Dynamic						
Ciss	Input Capacitance	V_{GS}=0V, V_{DS}=15V, f=1MHz		455		pF
Coss	Output Capacitance			318		pF
Crss	Reverse Transfer Capacitance			22		pF

A: The value of RθJA is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with TA=25°C. The value in any given application depends on the user's specific board design. B: Repetitive rating, pulse width limited by junction temperature. C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

Q2 Electrical Characteristics @TA=25℃ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 30 V, V_{GS} = 0V			1	μA
I_{GSS}	Gate Leakage Current	V_{GS} = ±20V, V_{DS} = 0V			100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_{DS} = 250μA	1	1.6	2.5	V
$R_{DS(on)}$	Drain-Source On-state Resistance	V_{GS} = 10V, I_D = 10A		8.5	10.5	mΩ
		V_{GS} = 4.5V, I_D = 8A		12.5	16	mΩ
gFS	Forward Transconductance	V_{DS} = 5V, I_D= 5A		12		S
V_{SD}	Diode Forward Voltage	I_{SD} = 1A , V_{GS}=0V			1.3	V
Switching						
Qg	Total Gate Charge	V_{GS}=10V, V_{DS}=15V, I_D=5A		8		nC
Qgs	Gate-Source Charge			1.6		nC
Qgd	Gate-Drain Charge			1.2		nC
td (on)	Turn-on Delay Time	V_{GS}=10V, V_{DD}=15V, I_D=1A,R_G=6Ω		8.5		ns
tr	Turn-on Rise Time			10		ns
td(off)	Turn-off Delay Time			14		ns
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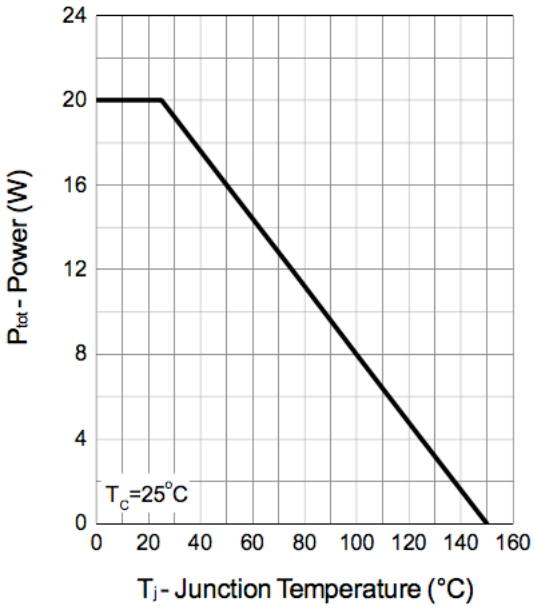
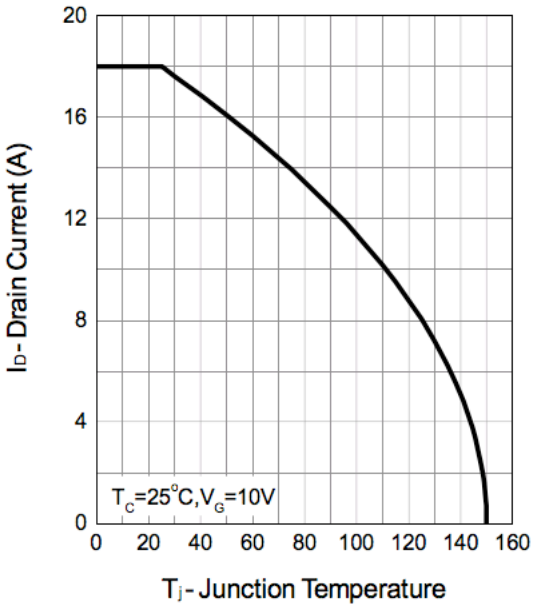
- **Q1 TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

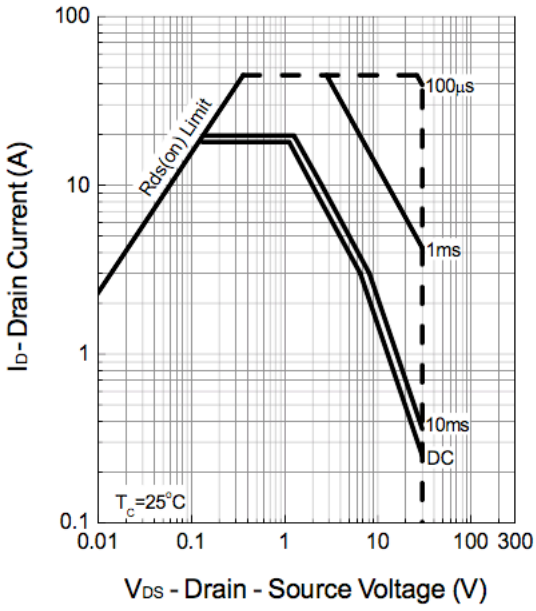
Power Dissipation



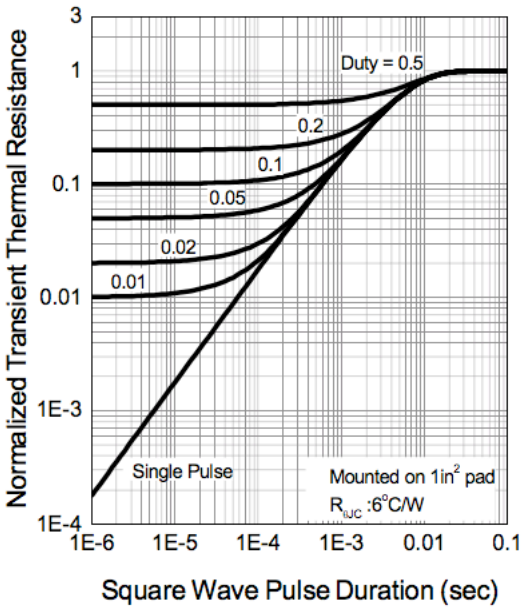
Drain Current



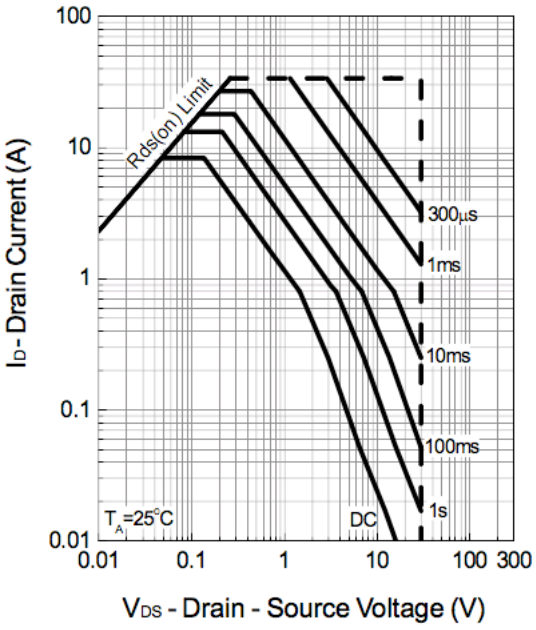
Safe Operation Area



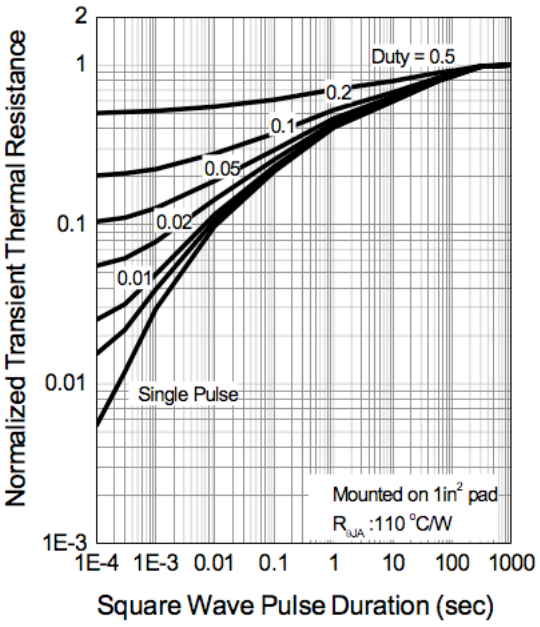
Thermal Transient Impedance



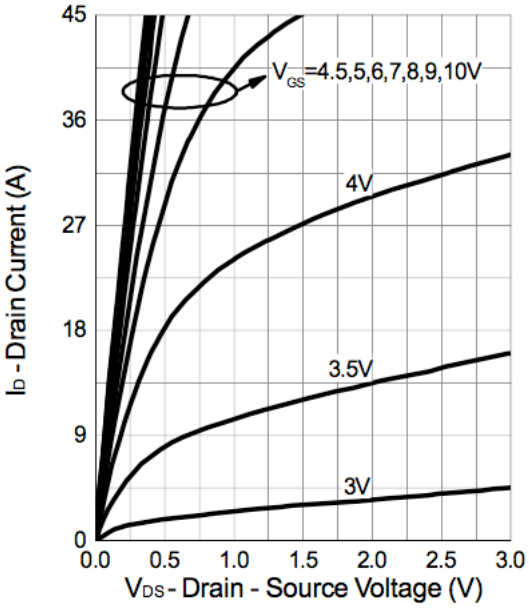
Safe Operation Area



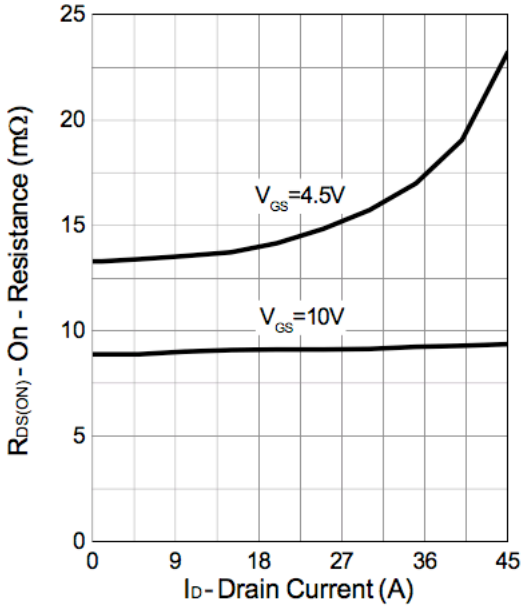
Thermal Transient Impedance



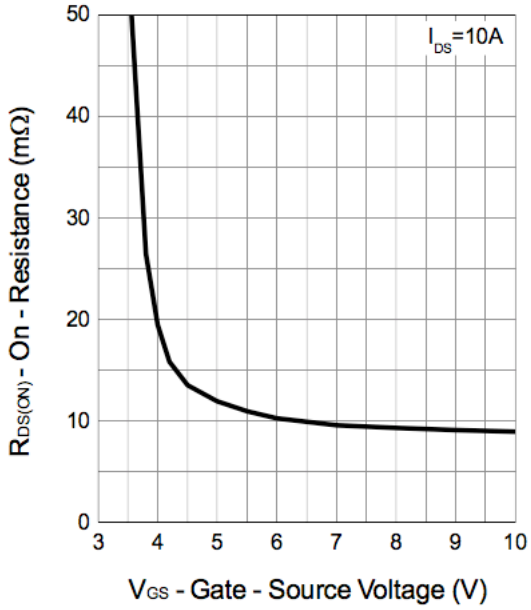
Output Characteristics



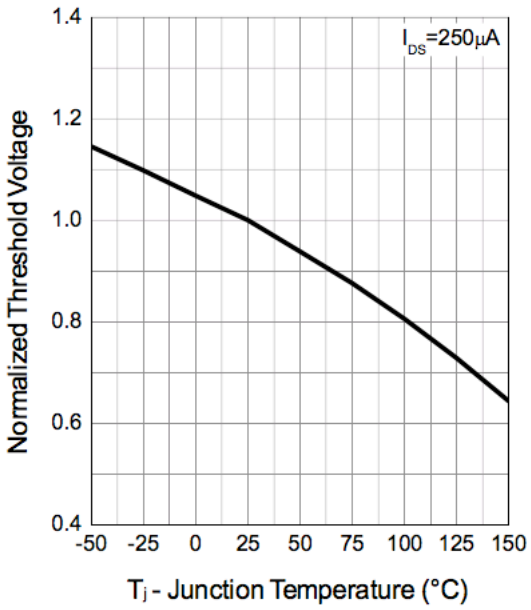
Drain-Source On Resistance



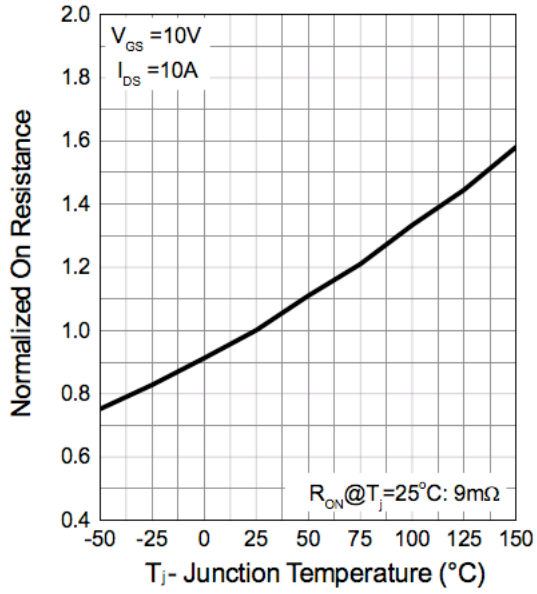
Gate-Source On Resistance



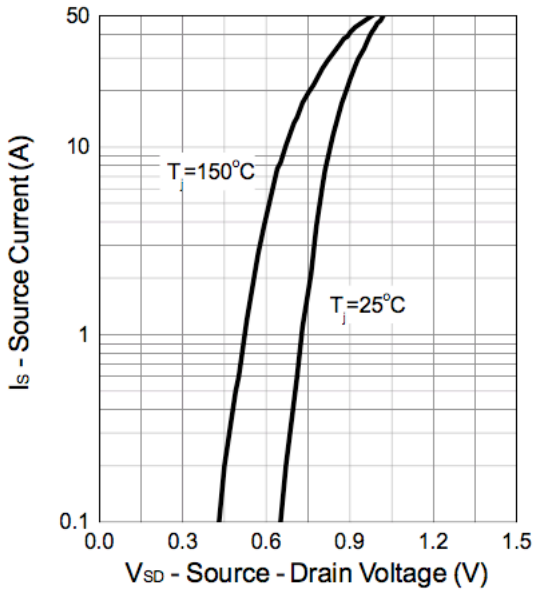
Gate Threshold Voltage



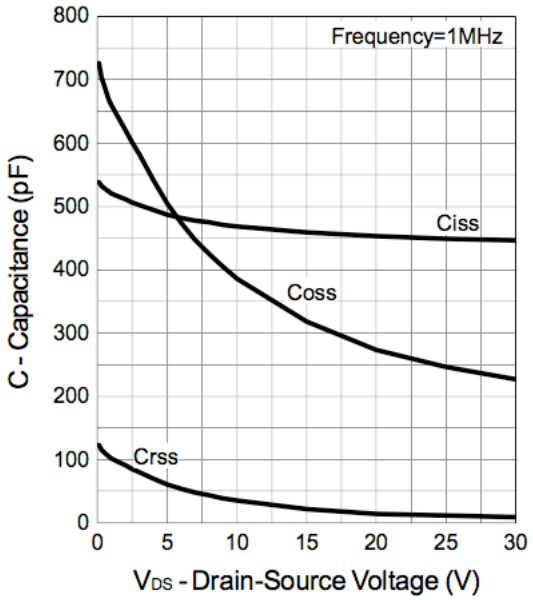
Drain-Source On Resistance



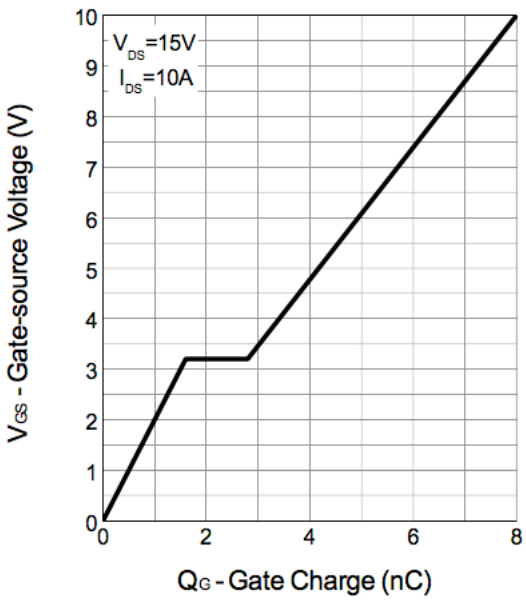
Source-Drain Diode Forward



Capacitance

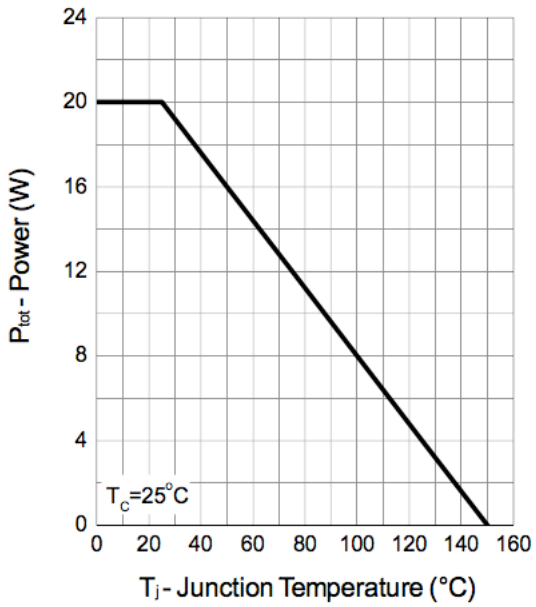


Gate Charge

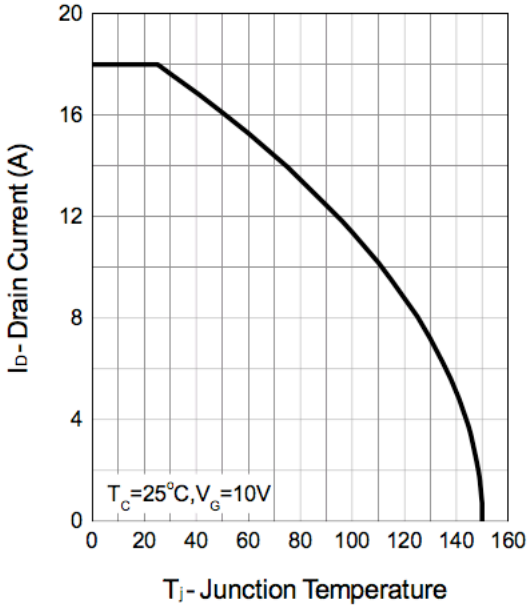


- **Q2 TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

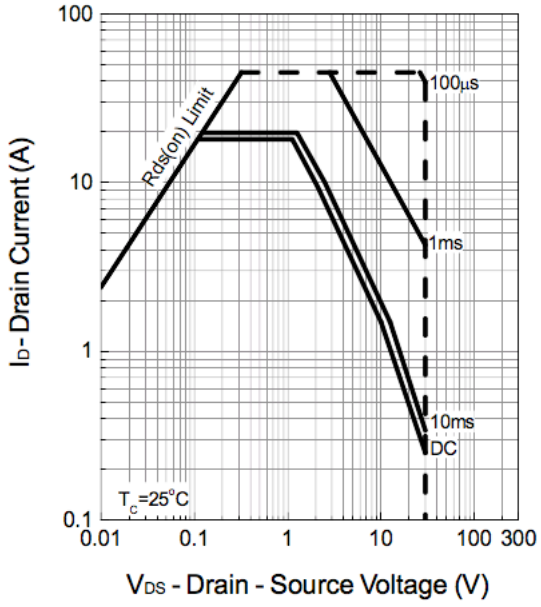
Power Dissipation



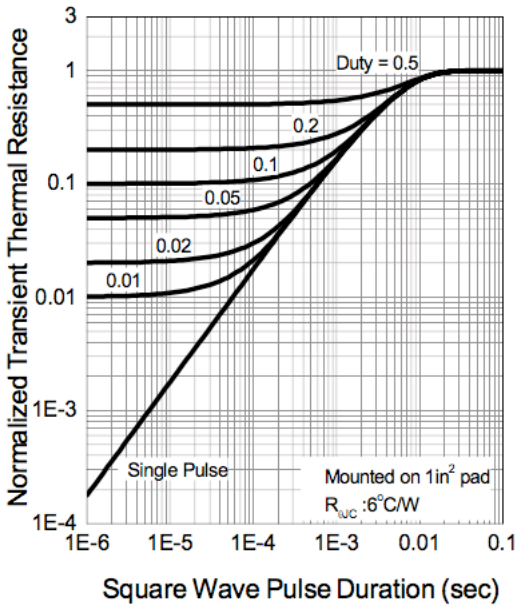
Drain Current



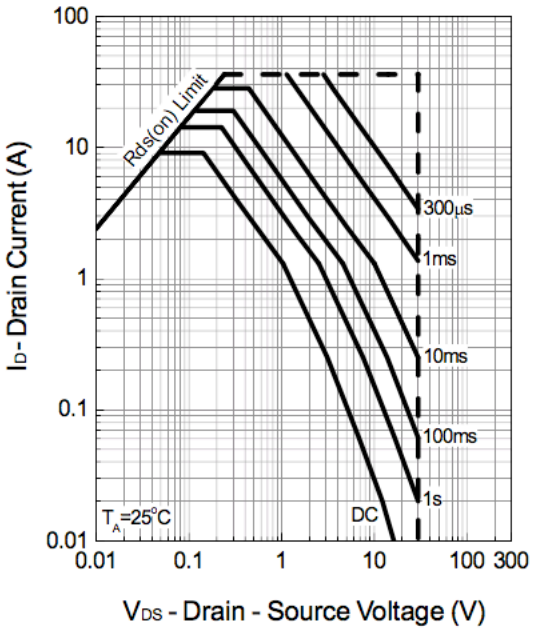
Safe Operation Area



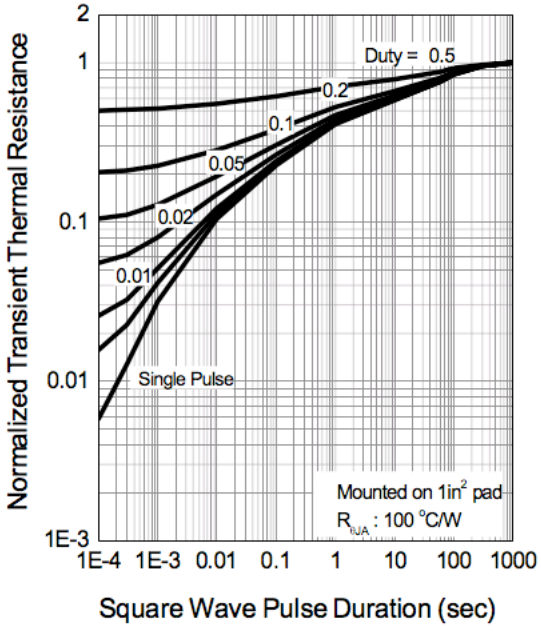
Thermal Transient Impedance



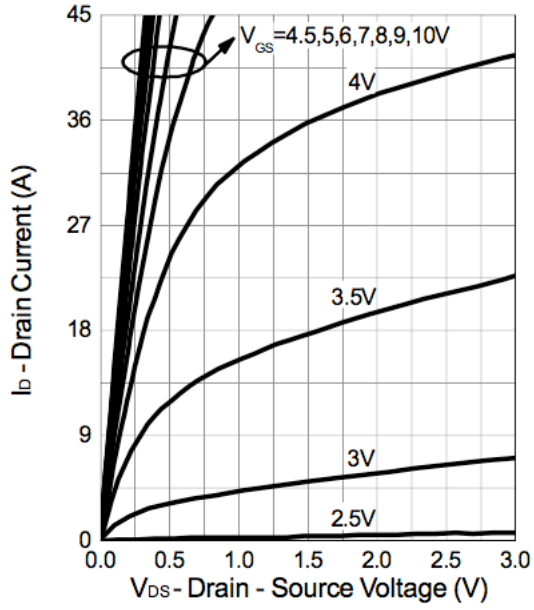
Safe Operation Area



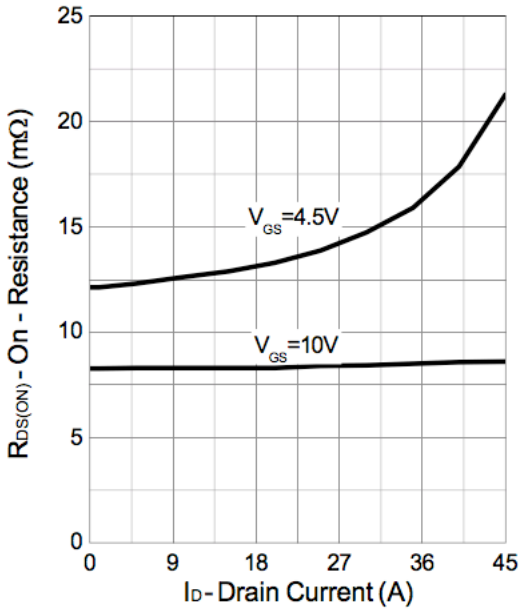
Thermal Transient Impedance



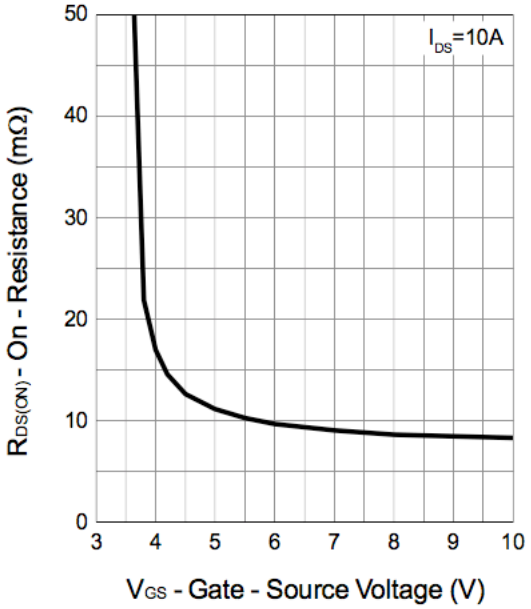
Output Characteristics



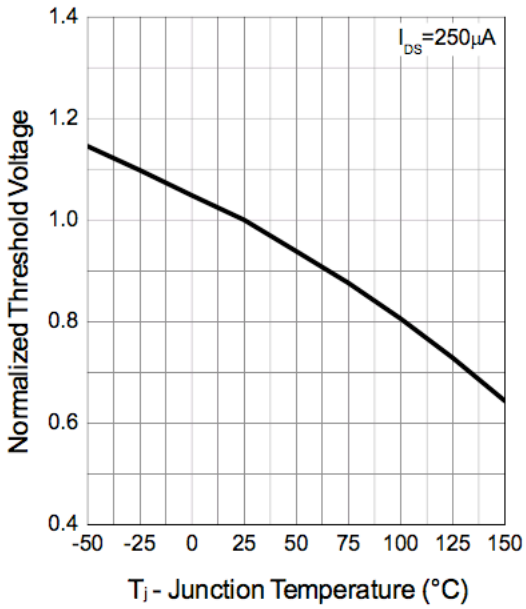
Drain-Source On Resistance



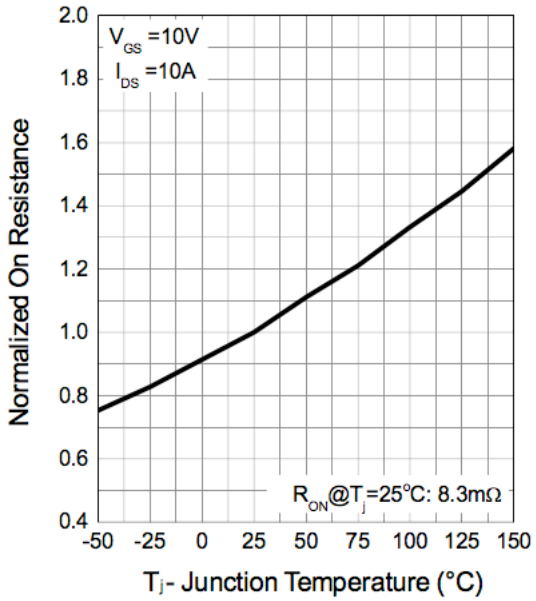
Gate-Source On Resistance



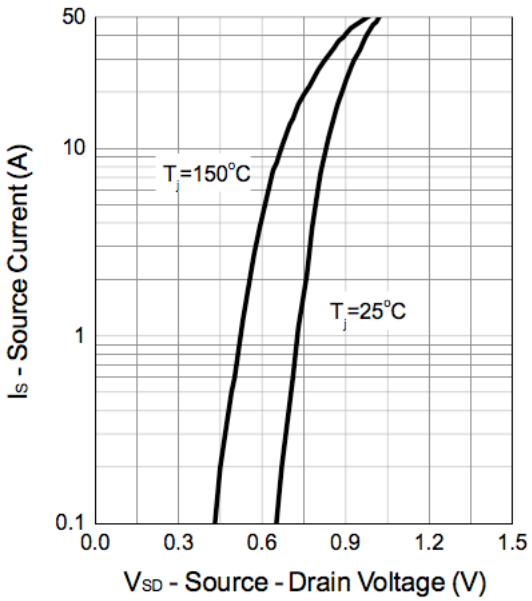
Gate Threshold Voltage



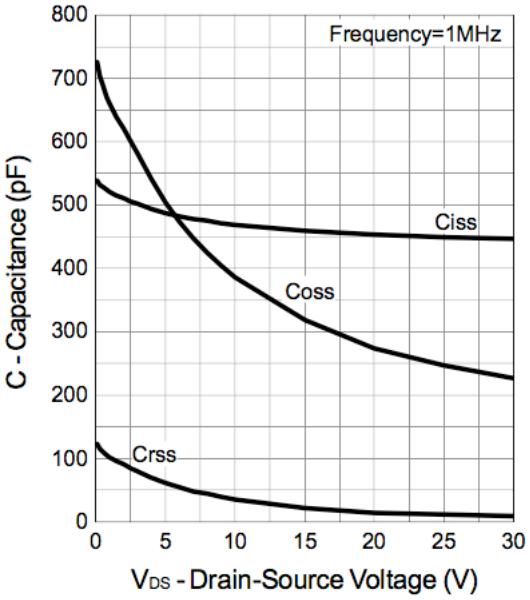
Drain-Source On Resistance



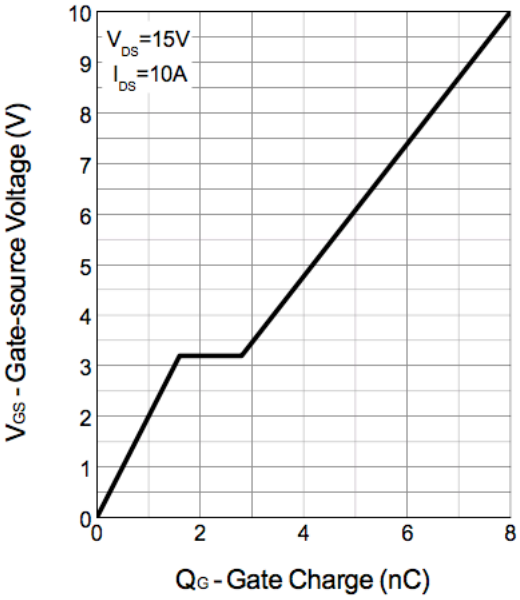
Source-Drain Diode Forward



Capacitance



Gate Charge



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