RoHS COMPLIANT

Complementary Enhancement Mode Power MOSFET

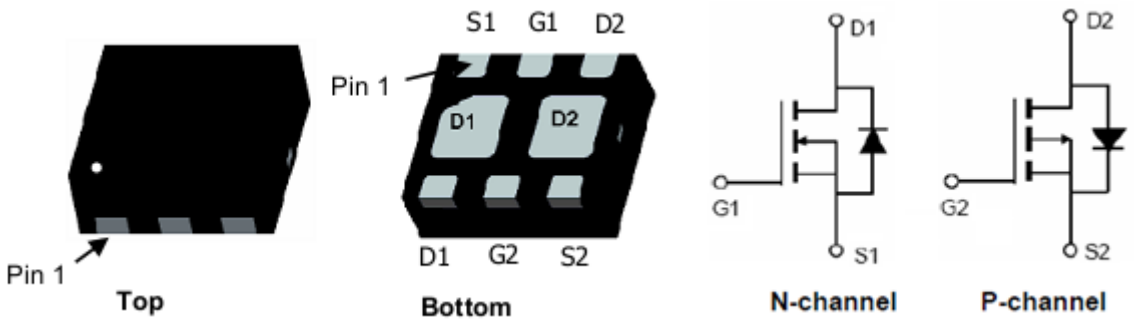
● Features

N-channel	P-channel
V_{DS} = 20V,	V_{DS} = -15 V
I_D = 6.9A	I_D = - 4.7A
$R_{DS(ON)}$	$R_{DS(ON)}$
V_{GS}= 4.5V, TYP 20 mΩ	V_{GS}= - 4.5V, TYP 47 mΩ
V_{GS}= 2.5V, TYP 25 mΩ	V_{GS}= - 2.5V, TYP 61 mΩ

● General Description

- Power Management
- Portable Equipment

● Pin Configurations



DFN2*2-6L

● Absolute Maximum Ratings @T_A=25℃ unless otherwise noted

Parameter		Symbol	N-Ratings	P-Ratings	Unit
Drain-Source Voltage		V_{DSS}	20	-15	V
Gate-Source Voltage		V_{GSS}	±10	±10	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	6.9	-4.7	A
	T_A=100°C		4.3	-2.9	
Drain Current (Pulse) *B		I_{DM}	15	-15	A
Power Dissipation	T_A=25°C	P_D	1.9		W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150		℃

● Thermal Resistance Ratings

Parameter		Symbol	Maximum	Unit
Maximum Junction-to-Ambient	t ≤ 5 s	R_{thJA}	65	°C/W

- **N-channel Electrical Characteristics** @T_A=25℃ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
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 Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS}= 250μA	0.4	0.65	1	V
Gate Leakage Current	I_{GSS}	V_{GS}= ±10V, V_{DS}=0V	--	--	±100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 2.8A	--	20	26	mΩ
	$R_{DS(on)}$	V_{GS} = 2.5V, I_D = 2A	--	25	32.5	mΩ
Diode Forward Voltage	V_{SD}	I_{SD}= 1A , V_{GS}=0V	--	0.79	1.2	V
Diode Forward Current *AC	I_S	T_A =25°C	--	--	2.4	A
Switching						
Total Gate Charge	Q_g	V_{DS}=10V,V_{GS}=4.5V,I_D = 5.5 A	--	3.7	--	nC
Gate-Source Charge	Q_{gs}		--	0.85	--	nC
Gate-Drain Charge	Q_{gd}		--	0.95	--	nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 10 V, R_L = 2.3Ω I_D=4.4 A,V_{GEN}=4.5 V, R_g = 1Ω	--	10	--	ns
Turn-on Rise Time	t_r		--	12	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	21	--	ns
Turn-Off Fall Time	t_f		--	16	--	ns
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS} = 0 V, f = 1 MHz	--	350	--	pF
Output Capacitance	C_{oss}		--	82	--	pF
Reverse Transfer Capacitance	C_{rss}		--	50	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=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，Package Limited 4.5A..

- **P-channel Electrical Characteristics** @T_A=25℃ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D= -250μA	-15	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -15V, V_{GS} = 0V	--	--	-1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS}= -250μA	-0.4	-0.7	-1	V
Gate Leakage Current	I_{GSS}	V_{GS}= ±10V, V_{DS}=0V	--	--	±100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -2.8A	--	47	61	mΩ
	$R_{DS(on)}$	V_{GS} = -2.5V, I_D = -2A	--	61	80	mΩ
Diode Forward Voltage	V_{SD}	I_{SD}= -1A , V_{GS}=0V	--	-0.75	-1.2	V
Diode Forward Current *AC	I_S	T_A =25°C	--	--	-2.5	A
Switching						
Total Gate Charge	Q_g	V_{DS} =-10 V, V_{GS} =-4.5 V, I_D = -4.9 A	--	9.5	--	nC
Gate-Source Charge	Q_{gs}		--	1.4	--	nC
Gate-Drain Charge	Q_{gd}		--	2.3	--	nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = - 10 V, R_L = 2.6Ω I_D≅- 3.9 A, V_{GEN} = -4.5 V, R_g = 1Ω	--	15	--	ns
Turn-on Rise Time	t_r		--	16	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	30	--	ns
Turn-Off Fall Time	t_f		--	10	--	ns
Dynamic						
Input Capacitance	C_{iss}	V_{DS} = -10 V, V_{GS} = 0 V, f = 1 MHz	--	781	--	pF
Output Capacitance	C_{oss}		--	98	--	pF
Reverse Transfer Capacitance	C_{rss}		--	96	--	pF

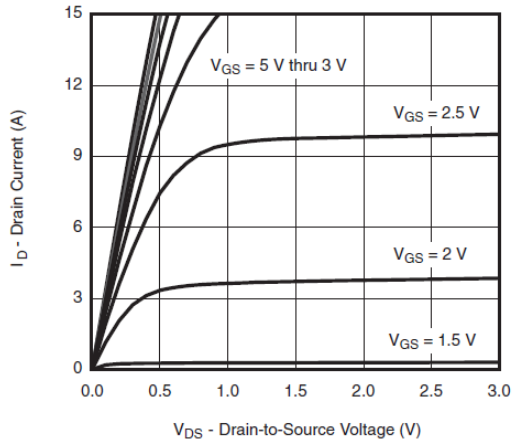
A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

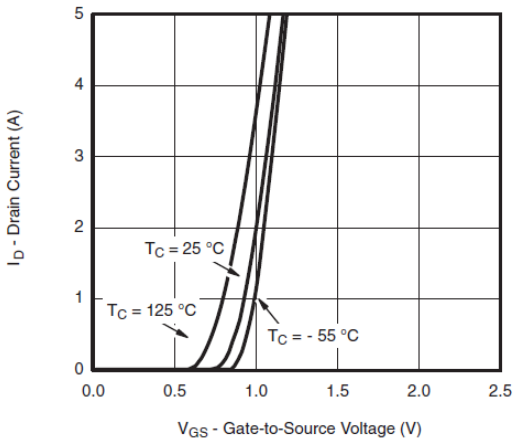
C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating,Package Limited -4.5A.

- **Typical Performance Characteristics（(TJ = 25 °C, unless otherwise noted)）**

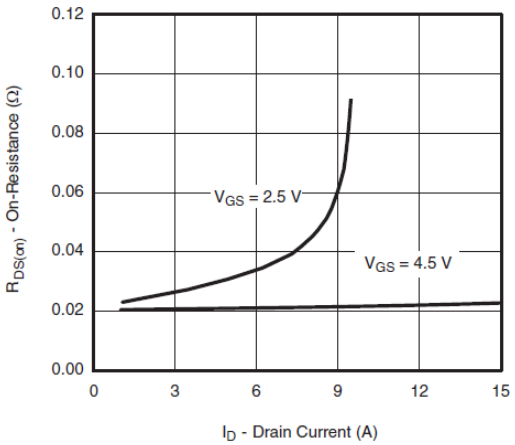
N-channel



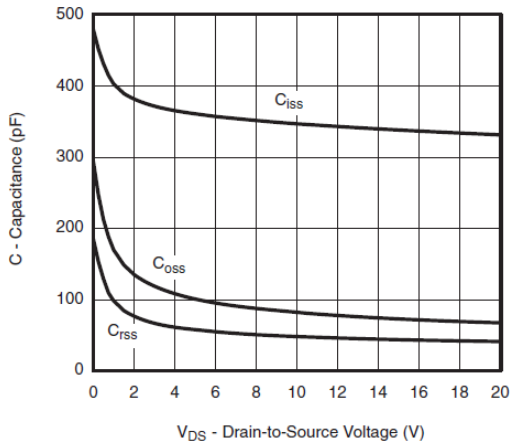
Output Characteristics



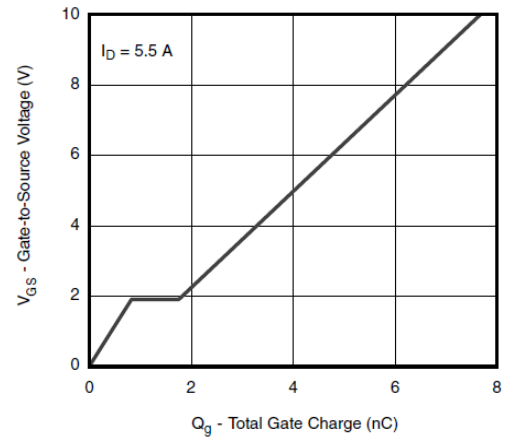
Transfer Characteristics



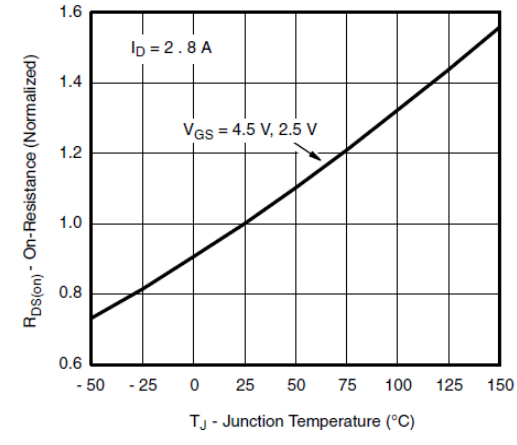
On-Resistance vs. Drain Current and Gate Voltage



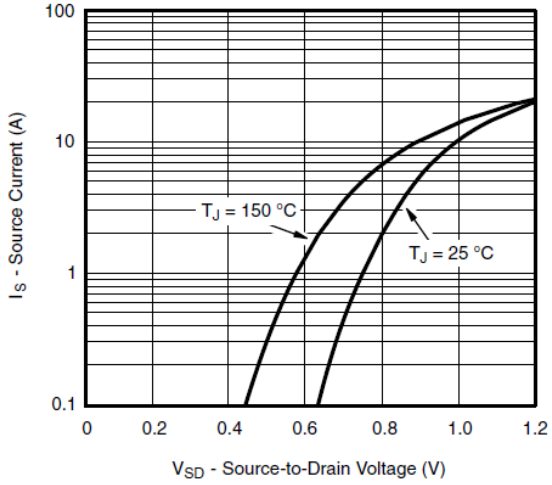
Capacitance



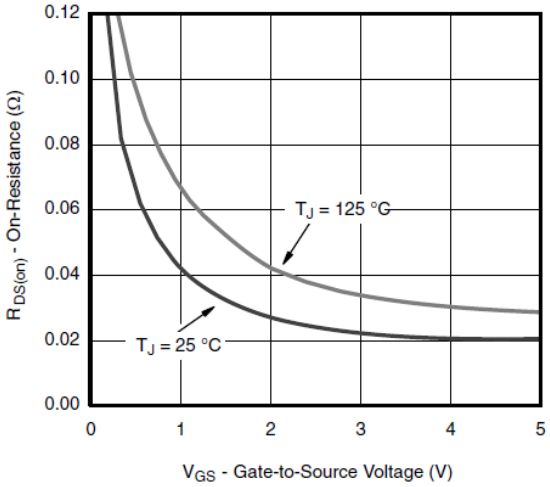
Gate Charge



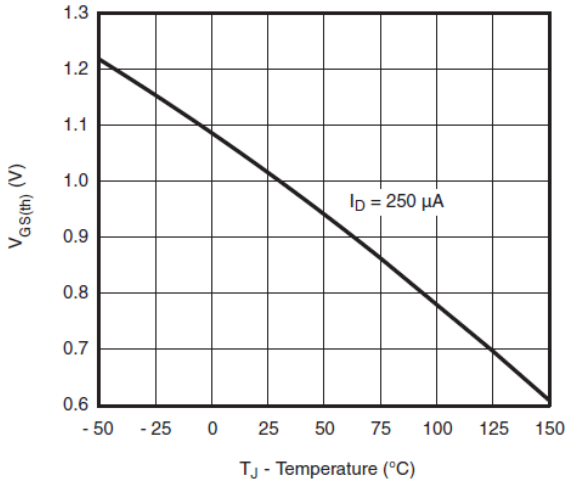
On-Resistance vs. Junction Temperature



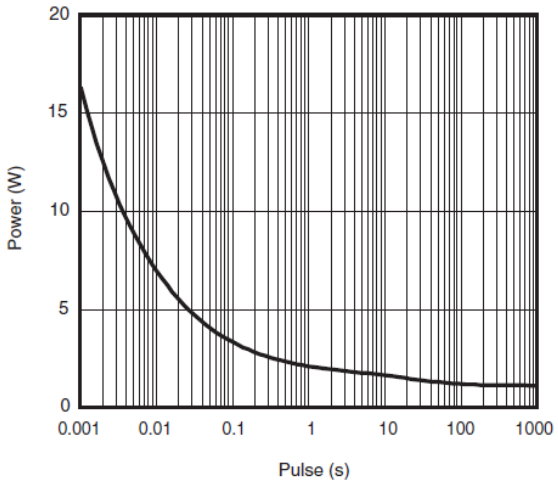
Source-Drain Diode Forward Voltage



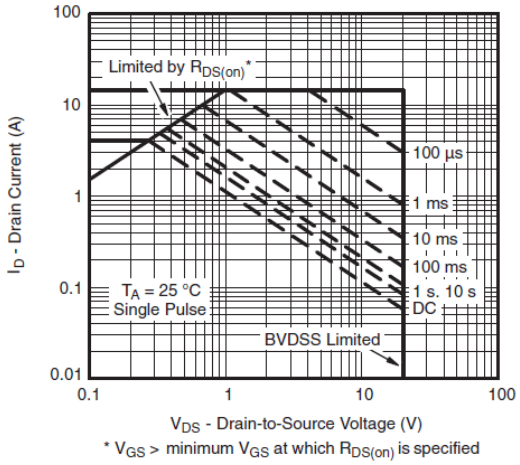
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

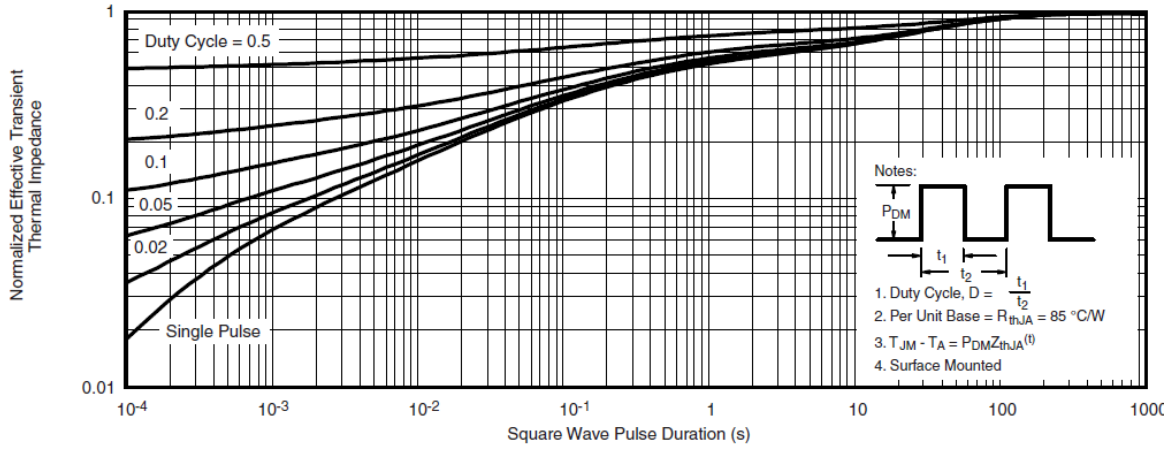


Single Pulse Power (Junction-to-Ambient)

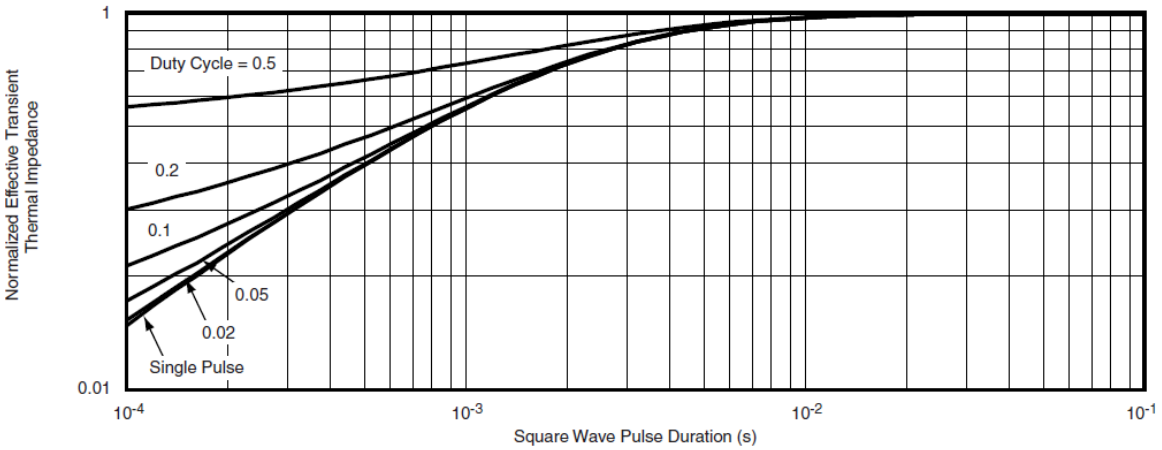


* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

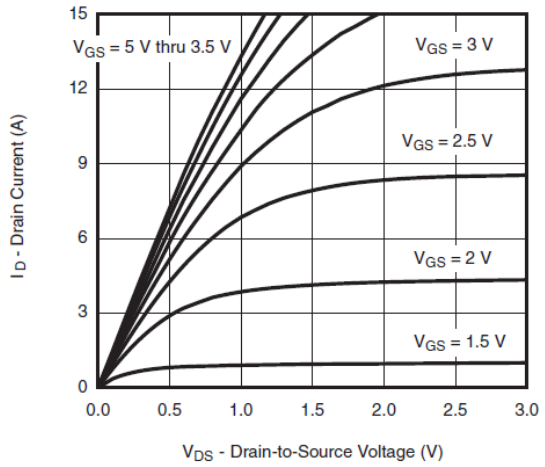


Normalized Thermal Transient Impedance, Junction-to-Ambient

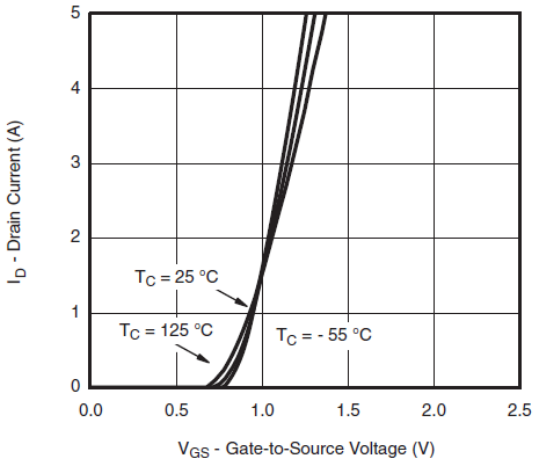


Normalized Thermal Transient Impedance, Junction-to-Case

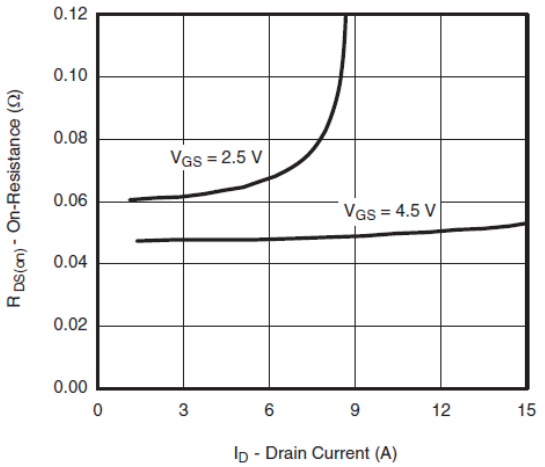
P-channel



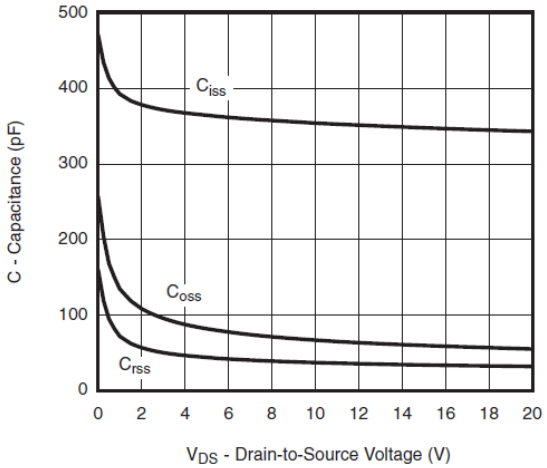
Output Characteristics



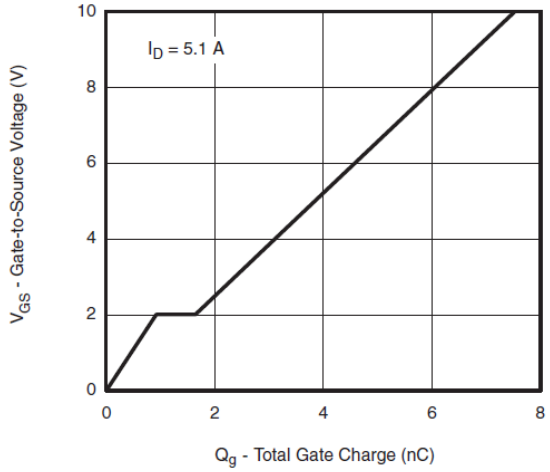
Transfer Characteristics



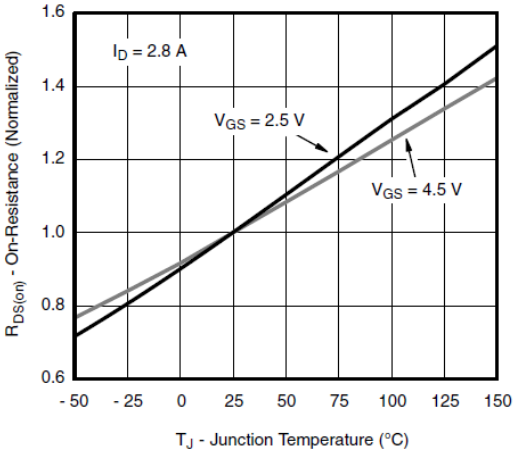
On-Resistance vs. Drain Current and Gate Voltage



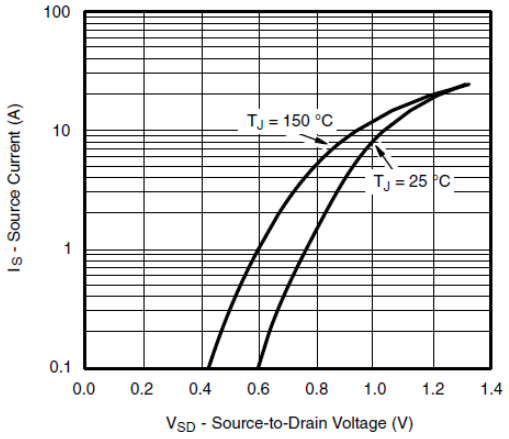
Capacitance



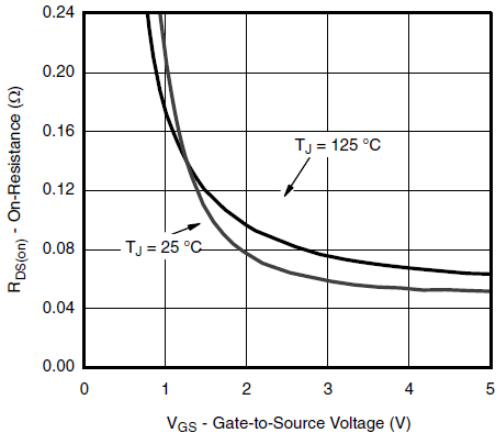
Gate Charge



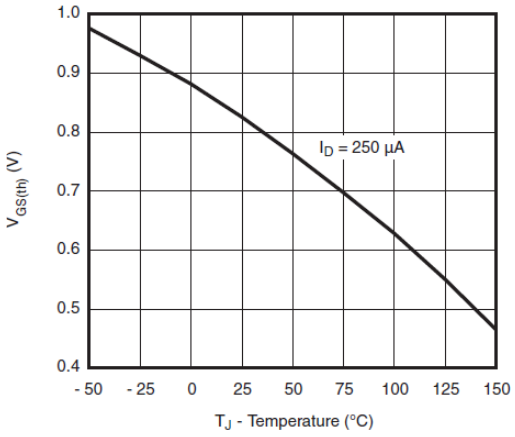
On-Resistance vs. Junction Temperature



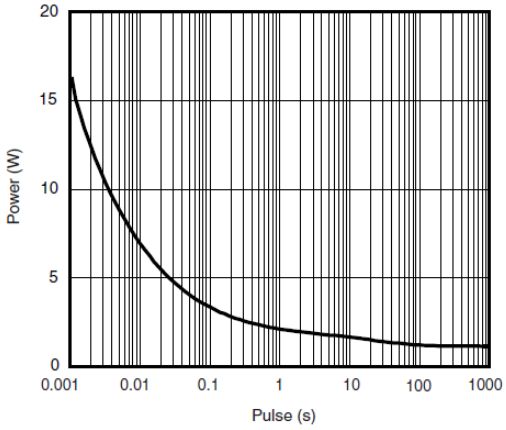
Source-Drain Diode Forward Voltage



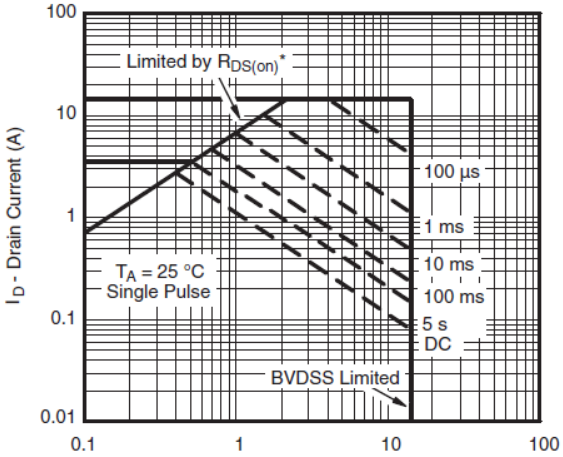
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

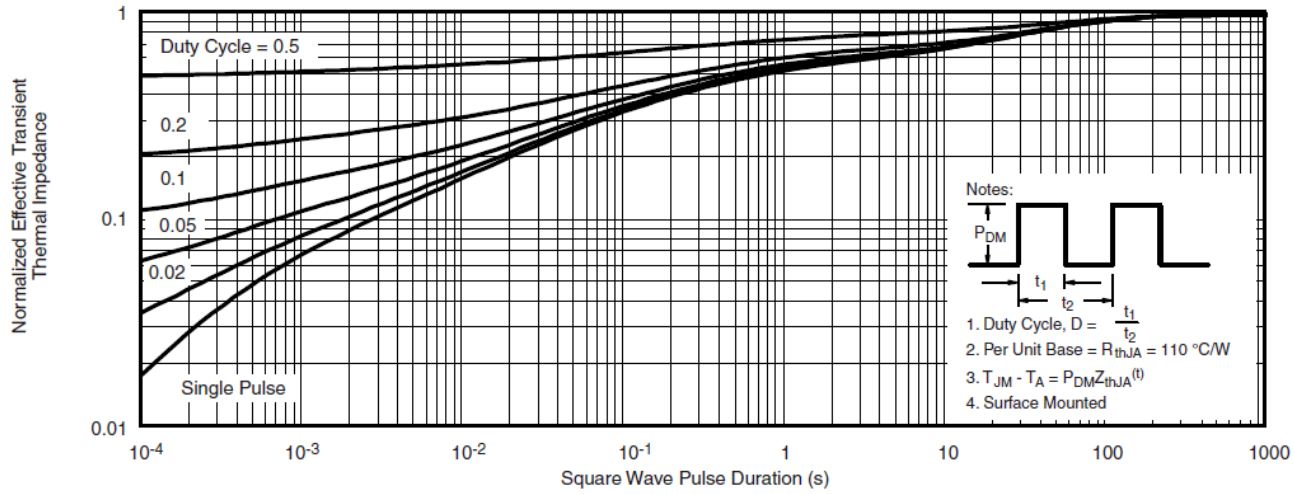


Single Pulse Power (Junction-to-Ambient)

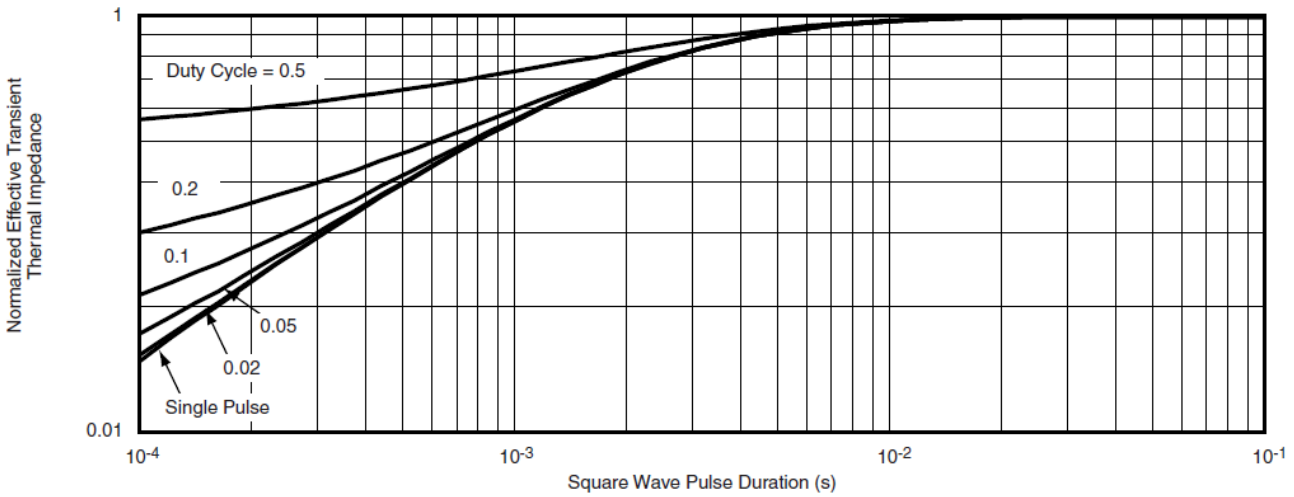


* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

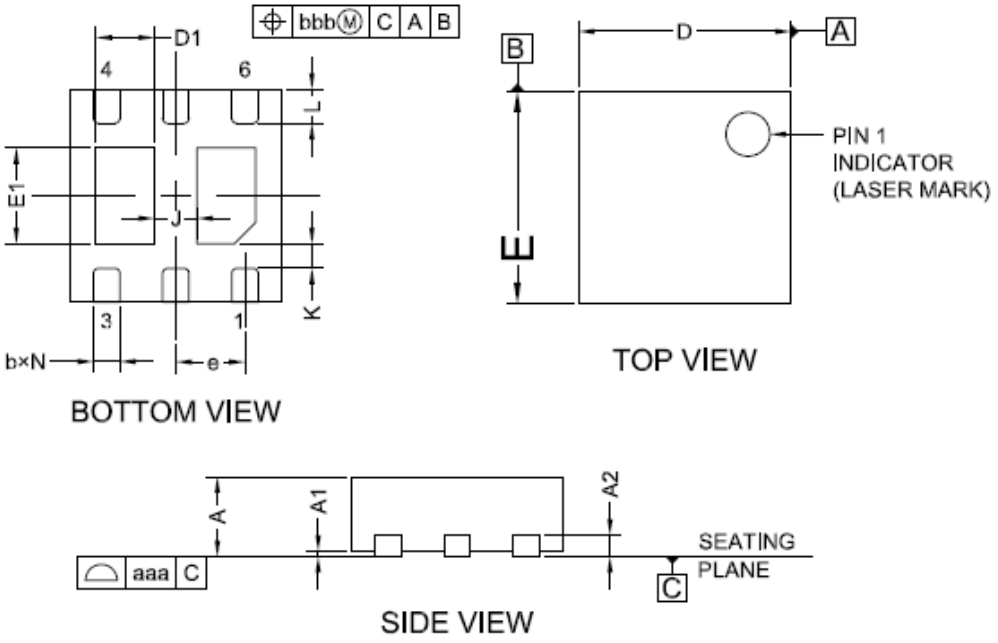


Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

- **Package Information**



COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	0,70	0.75	0,80
A1	0,00	0.02	0,05
A2		0,203	
b	0,225	0.275	0,325
D	1,95	2.00	2,05
D1	0,50	0.55	0,60
E	1,95	2.00	2,05
E1	0,85	0.90	0,95
e		0.65BSC	
L	0,27	0.32	0,37
J		0.40BSC	
K		0.20MIN	
N		6	
aaa		0.08	
bbb		0.10	

NOTES;

1.CONTROLLING DIMENSIONS ARE IN MILLIMETERS(ANGLES IN DEGREES).

2. COPLANARITY APPLIES TO THE EXPOSED PAD AS THE TERMINALS.