P-Channel Enhancement Mode MOSFET TDM3205

DESCRIPTION

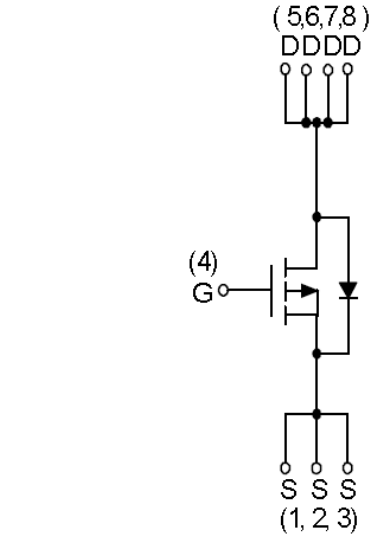
The TDM3205 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

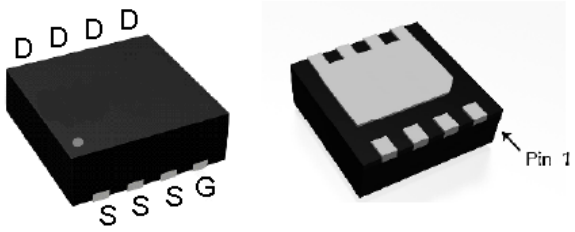
GENERAL FEATURES

- RDS(ON) < 9.9mΩ @ VGS=-1.8V
  RDS(ON) < 6.8mΩ @ VGS=-2.5V
  RDS(ON) < 4.5mΩ @ VGS=-4.5V
  RDS(ON) < 3.5mΩ @ VGS=-10V
- High Power and current handing capability
- Surface Mount Package
- Lead Free and Green Devices Available(RoHS Compliant)

Application

- PWM applications
- Load switch
- Power management
- Powered Systems





DFN3.3*3.3-8

ABSOLUTE MAXIMUM RATINGS(T_A=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Diode Continuous Forward Current	I_S	-50	A
Drain Current @ Current-Pulsed	I_{DM}（V_{GS}=4.5V）	-100	A
Drain Current @ Continuous	I_D（T_C=25℃）	-95	A
	I_D（T_C=100℃）	-60	A
Maximum Power Dissipation	P_D（T_C=25℃）	62.5	W
	P_D（T_C=100℃）	25	W
Drain Current @ Continuous	I_D（T_A=25℃）	-25	A
	I_D（T_A=70℃）	-20	A
Maximum Power Dissipation	P_D（T_A=25℃）	4.2	W
	P_D（T_A=70℃）	2.7	W
Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$（t≤10s）	30	℃/W
	$R_{\theta JA}$（Steady State）	70	℃/W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	2	℃/W

Maximum Operating Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{STG}	-55 To 150	℃

ELECTRICAL CHARACTERISTICS (T_A=25℃unless otherwise noted)

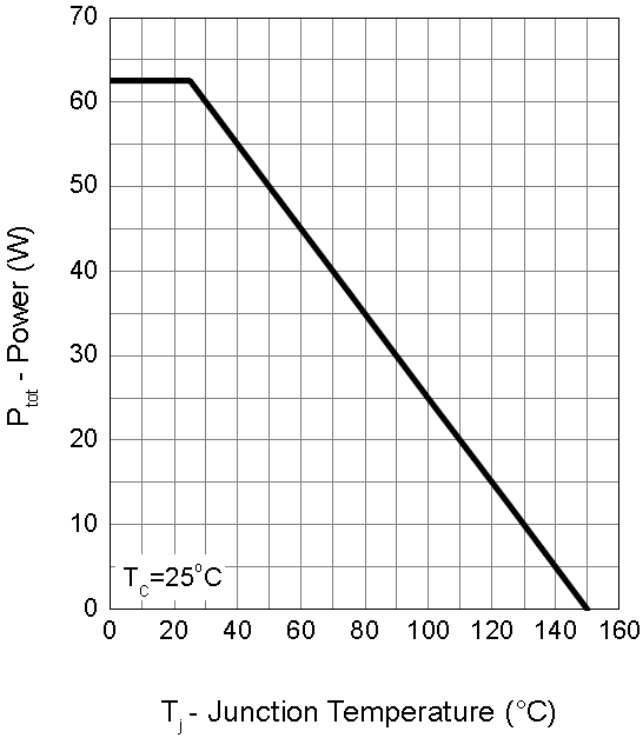
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	-20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=VGS,I_D=-250μA	-0.4	-0.7	-0.9	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-1.8V, I_D=-10A	-	6.8	9.9	mΩ
		V_{GS}=-2.5V, I_D=-20A	-	4.8	6.8	mΩ
		V_{GS}=-4.5V, I_D=-20A	-	3.5	4.5	mΩ
		V_{GS}=-10V, I_D=-20A	-	2.9	3.5	mΩ
DYNAMIC CHARACTERISTICS (Note3)						
Gate Resistance	R_G	V_{DS}=0V,V_{GS}=0V, F=1.0MHz	-	3	-	Ω
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V, F=1.0MHz	-	5350	-	PF
Output Capacitance	C_{oss}		-	1020	-	PF
Reverse Transfer Capacitance	C_{rss}		-	810	-	PF
SWITCHING CHARACTERISTICS (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=10V, R_L=10Ω, V_{GEN}=-4.5V,	-	19	-	nS
Turn-on Rise Time	t_r	R_G=6Ω , I_D=-1A	-	25	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	228	-	nS
Turn-Off Fall Time	t_f		-	72	-	nS
Total Gate Charge	Q_g	V_{DS}=10V,I_D=-20A,V_{GS}=-4.5V	-	54	-	nC
Gate-Source Charge	Q_{gs}		-	4.1	-	nC
Gate-Drain Charge	Q_{gd}		-	17	-	nC
Body Diode Reverse Recovery Time	T_{rr}	I_F=-20A, dI/dt=100A/μs	-	33	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}		-	17	-	nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 2)	V_{SD}	V_{GS}=0V,I_S=1A	-	-0.5	-1	V

NOTES:

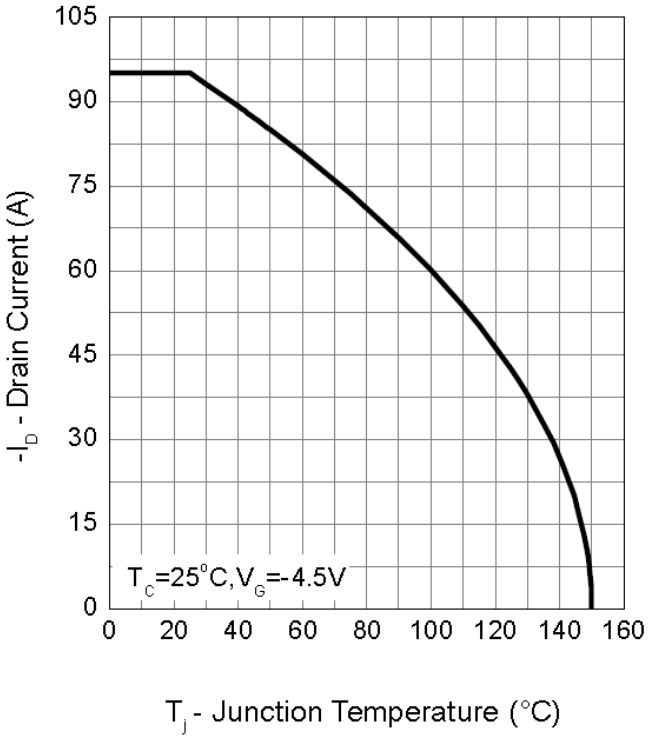
1. Pulse width limited by max. junction temperature.
2. $R_{\theta JA}$ steady state=999s. $R_{\theta JA}$ is measured with the device mounted on 1in2, Fr-4 board with 2oz.Copper
3. Guaranteed by design, not subject to production testing

Typical Operating Characteristics

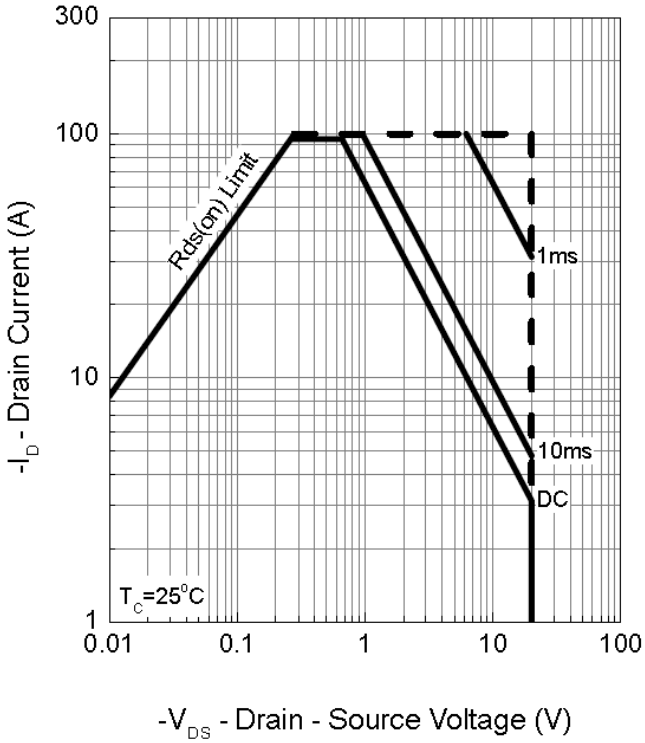
Power Dissipation



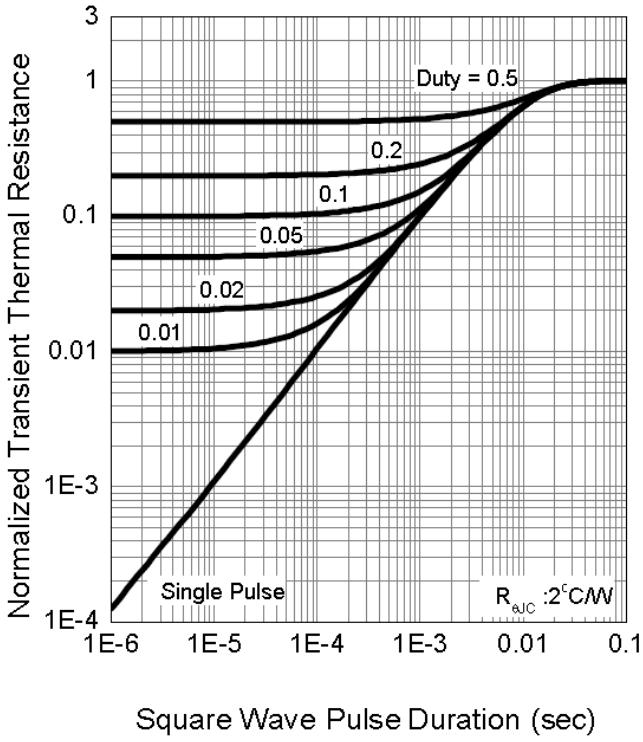
Drain Current



Safe Operation Area

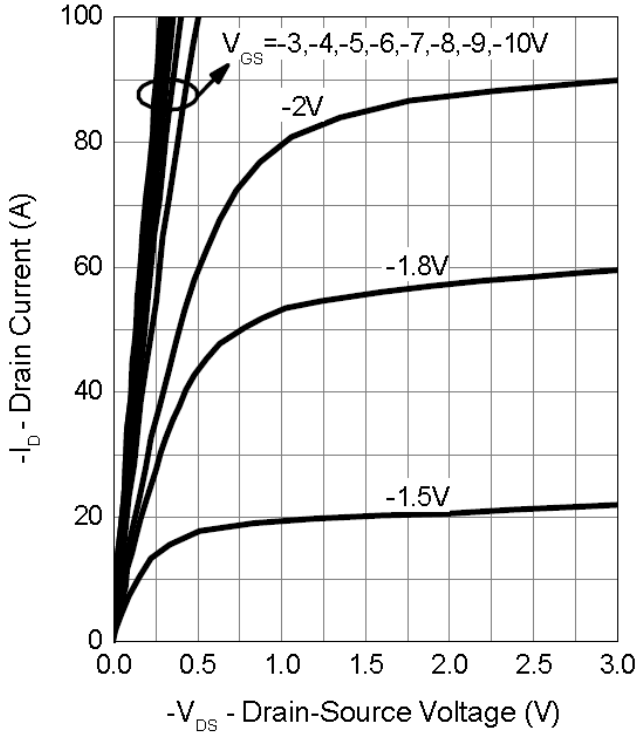


Thermal Transient Impedance

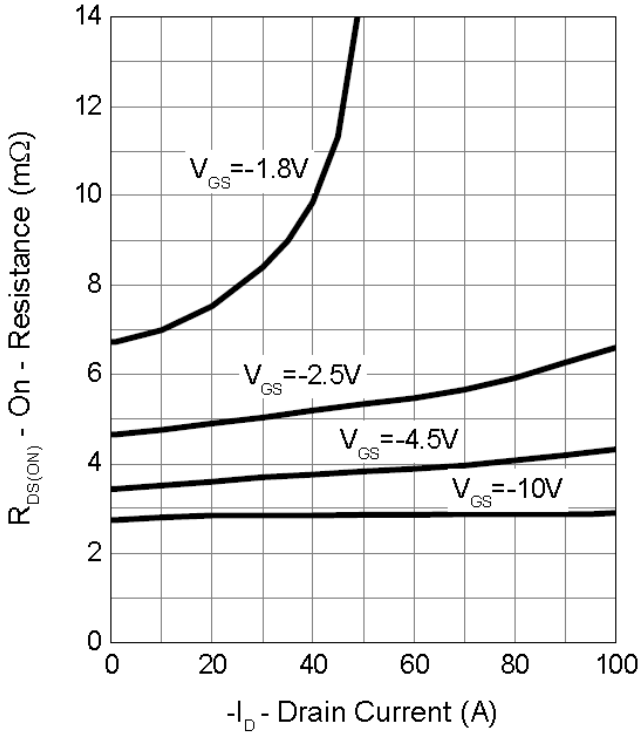


Typical Operating Characteristics(Cont.)

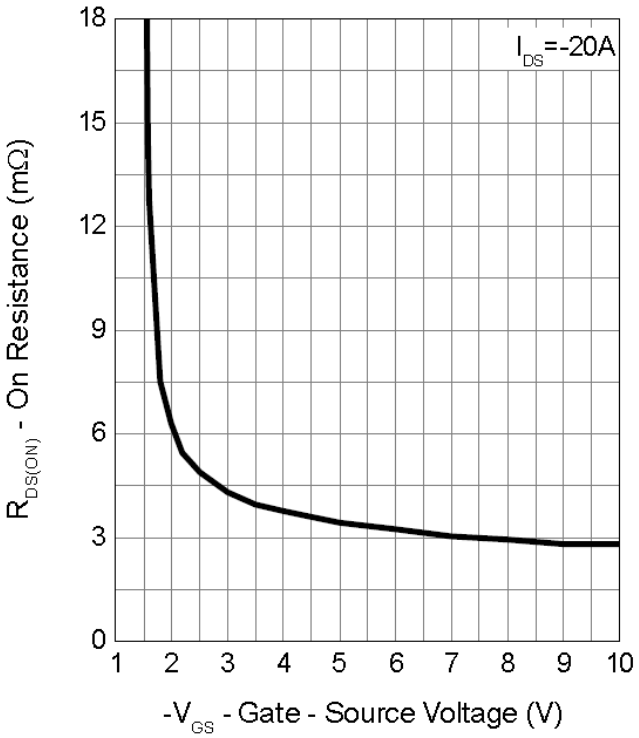
Output Characteristics



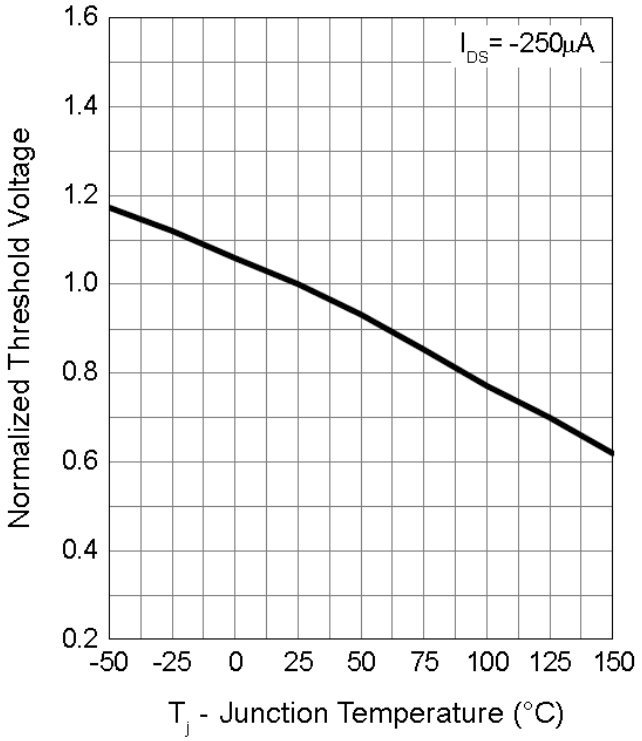
Drain-Source On Resistance



Gate-Source On Resistance

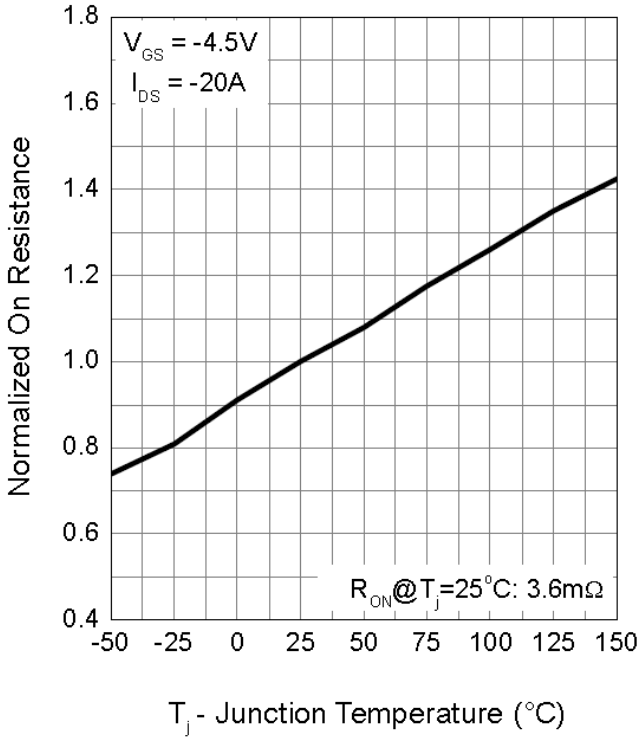


Gate Threshold Voltage

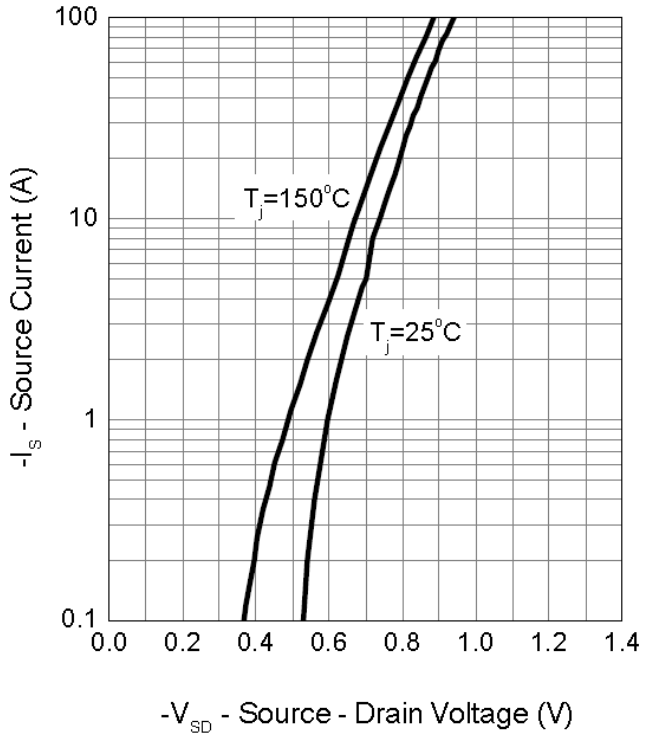


Typical Operating Characteristics (Cont.)

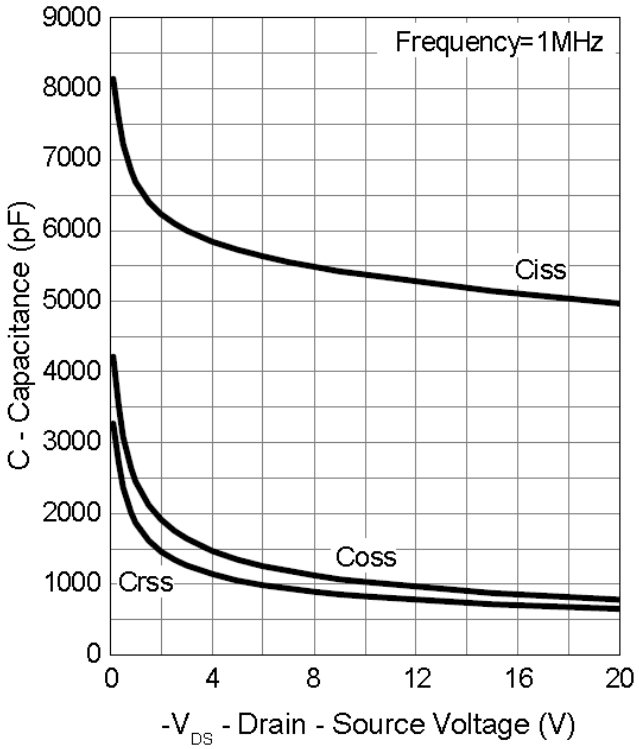
Drain-Source On Resistance



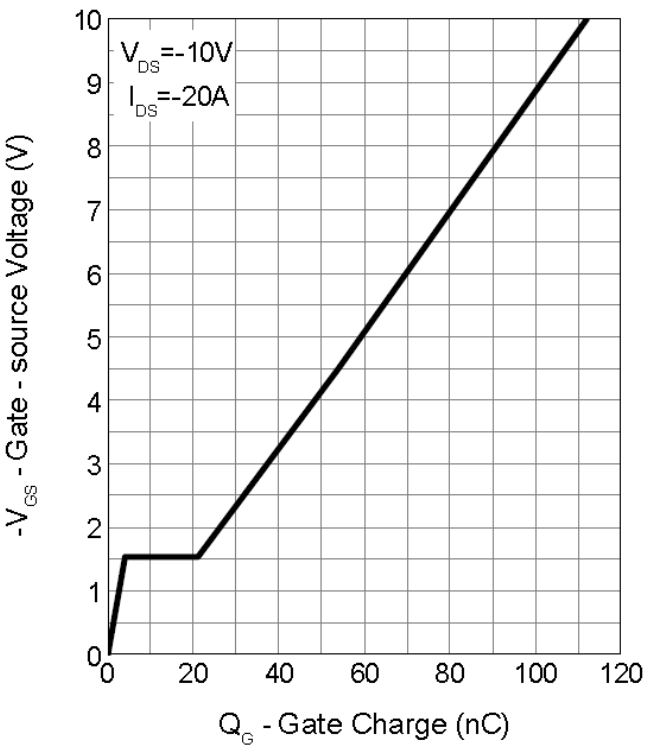
Source-Drain Diode Forward



Capacitance

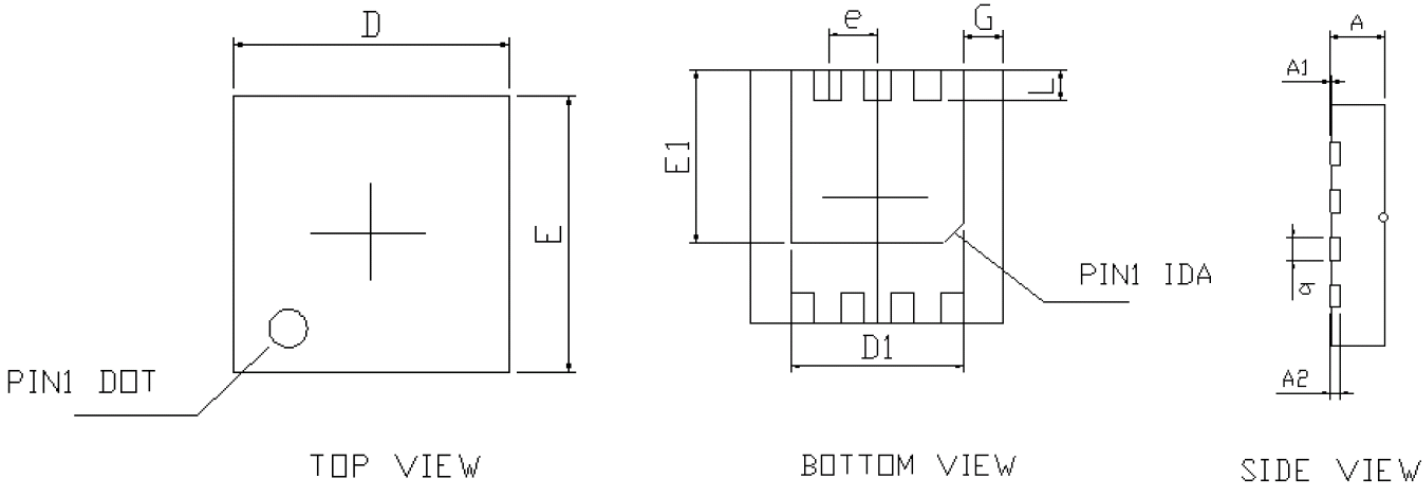


Gate Charge



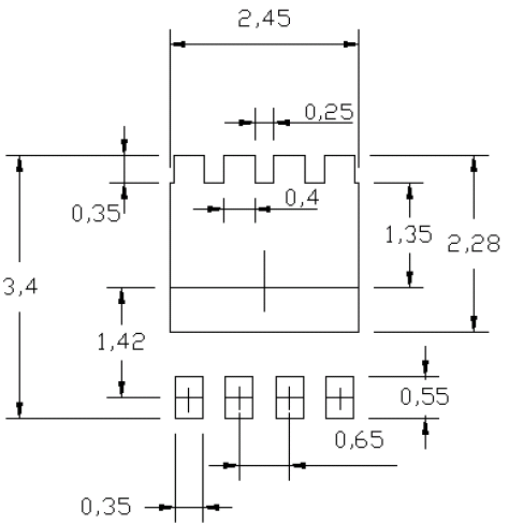
Package Information

DFN3.3*3.3-8 Package



SYMBOLS	DFN3.3x3.3B-8_EP1_S			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.700	0.800	0.028	0.032
A1	0.000	0.050	0.000	0.002
A2	0.100	0.250	0.004	0.010
b	0.240	0.350	0.009	0.014
D	3.150	3.400	0.124	0.134
D1	2.100	2.350	0.083	0.093
E	3.150	3.400	0.124	0.134
E1	2.150	2.350	0.850	0.093
e	0.600	0.700	0.024	0.028
G	0.475	0.575	0.019	0.023
L	0.350	0.450	0.014	0.018

RECOMMENDED LAND PATTERN



Design Notes