

P-Channel Enhancement Mode MOSFET

TDM3205

DESCRIPTION

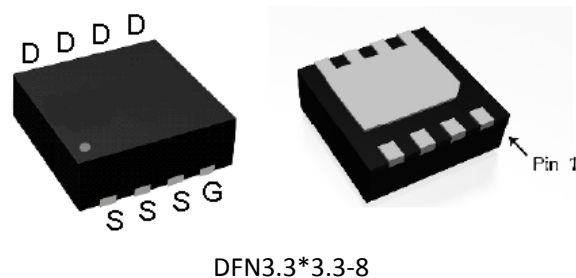
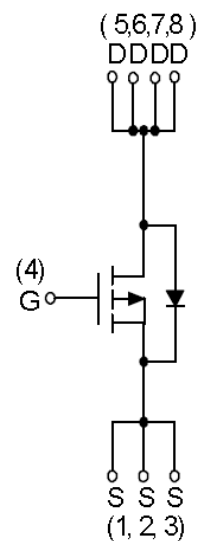
The TDM3205 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

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



ABSOLUTE MAXIMUM RATINGS(TA=25°C 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°C)	-95	A
	I _D (T _c =100°C)	-60	A
Maximum Power Dissipation	P _D (T _c =25°C)	62.5	W
	P _D (T _c =100°C)	25	W
Drain Current @ Continuous	I _D (T _A =25°C)	-25	A
	I _D (T _A =70°C)	-20	A
Maximum Power Dissipation	P _D (T _A =25°C)	4.2	W
	P _D (T _A =70°C)	2.7	W
Thermal Resistance,Junction-to-Ambient (Note 2)	R _{θJA} (t≤10s)	30	°C/W
	R _{θJA} (Steady State)	70	°C/W
Thermal Resistance,Junction-to-Case	R _{θJC}	2	°C/W

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Maximum Operating Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{STG}	-55 To 150	°C

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

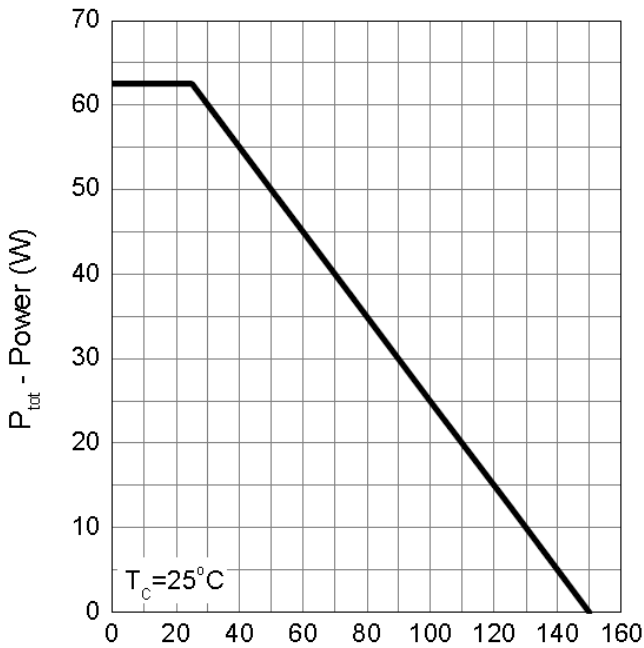
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	-20	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , 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, R _G =6Ω, I _D =-1A	-	19	-	nS
Turn-on Rise Time	t _r		-	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_{θJA} steady state=999s. R_{θJA} is measured with the device mounted on 1in2, Fr-4 board with 2oz.Copper
3. Guaranteed by design, not subject to production testing

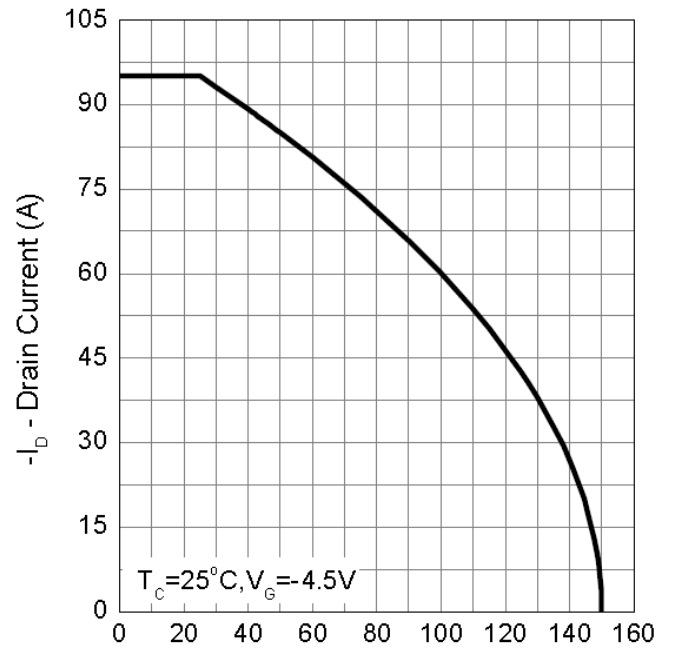
Typical Operating Characteristics

Power Dissipation



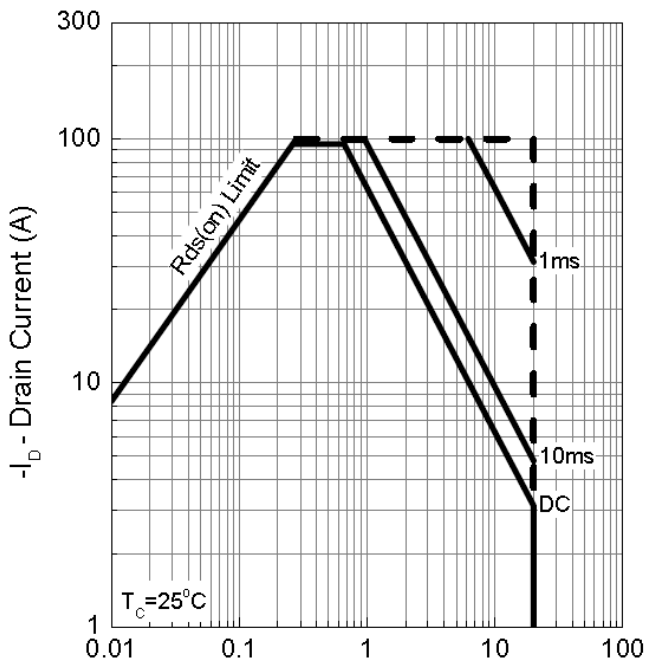
T_j - Junction Temperature (°C)

Drain Current



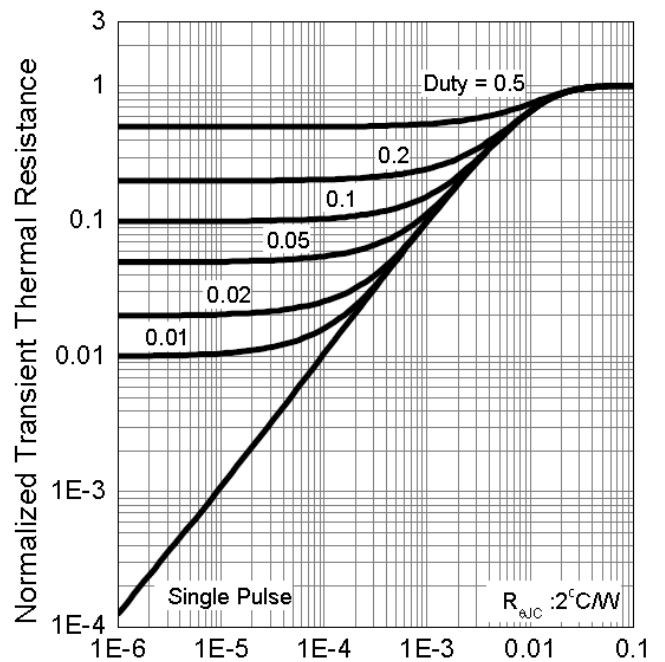
T_j - Junction Temperature (°C)

Safe Operation Area



-V_{DS} - Drain - Source Voltage (V)

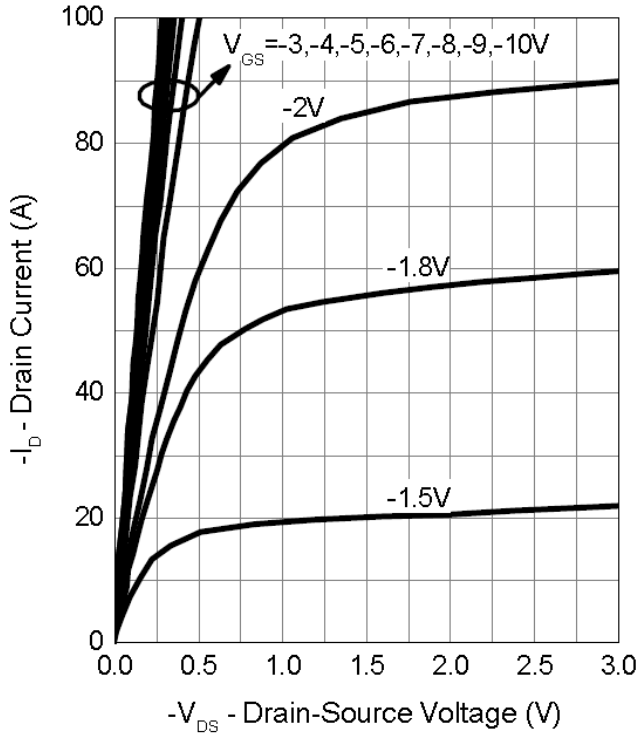
Thermal Transient Impedance



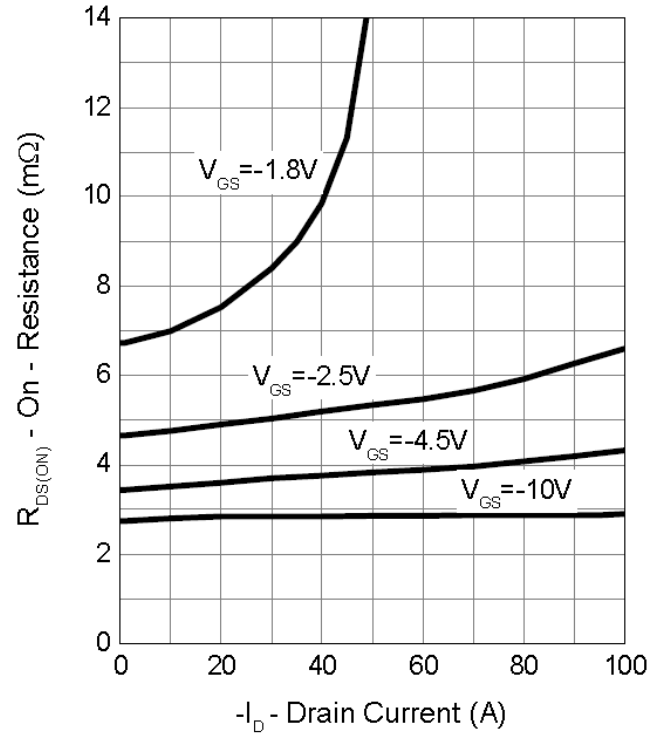
Square Wave Pulse Duration (sec)

Typical Operating Characteristics(Cont.)

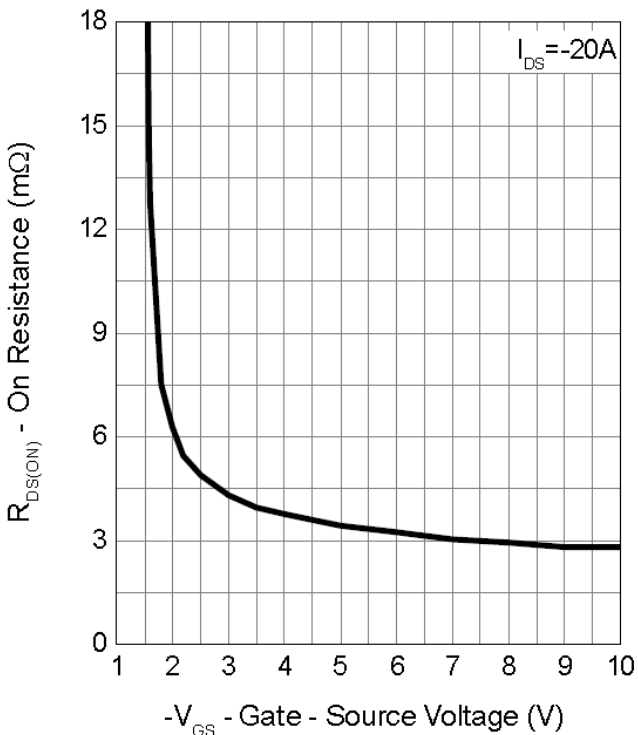
Output Characteristics



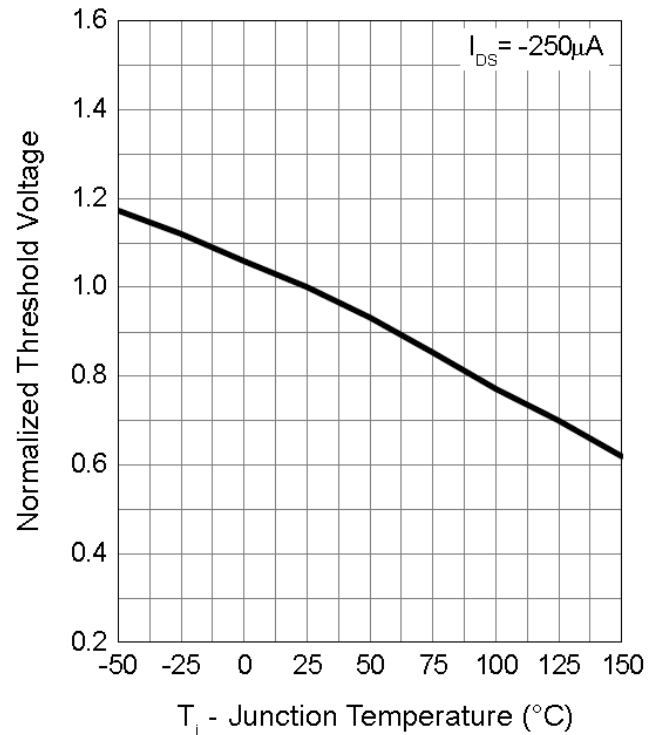
Drain-Source On Resistance



Gate-Source On Resistance

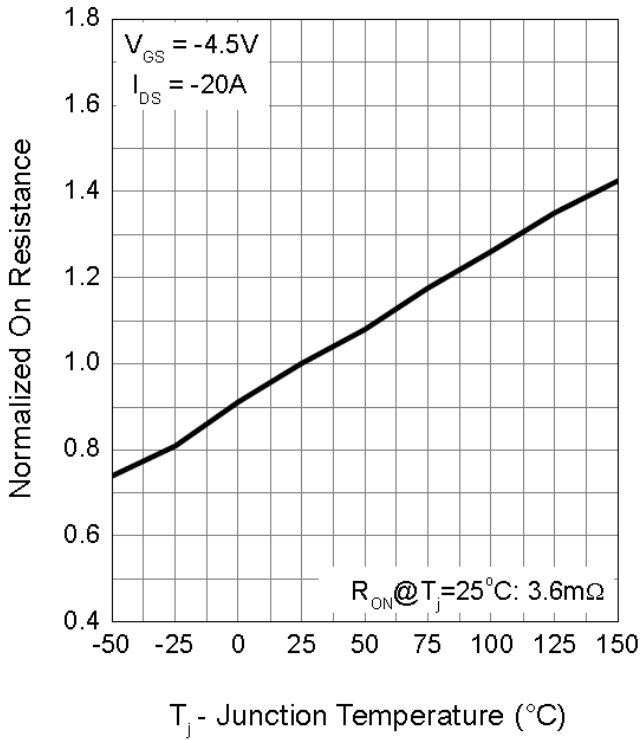


Gate Threshold Voltage

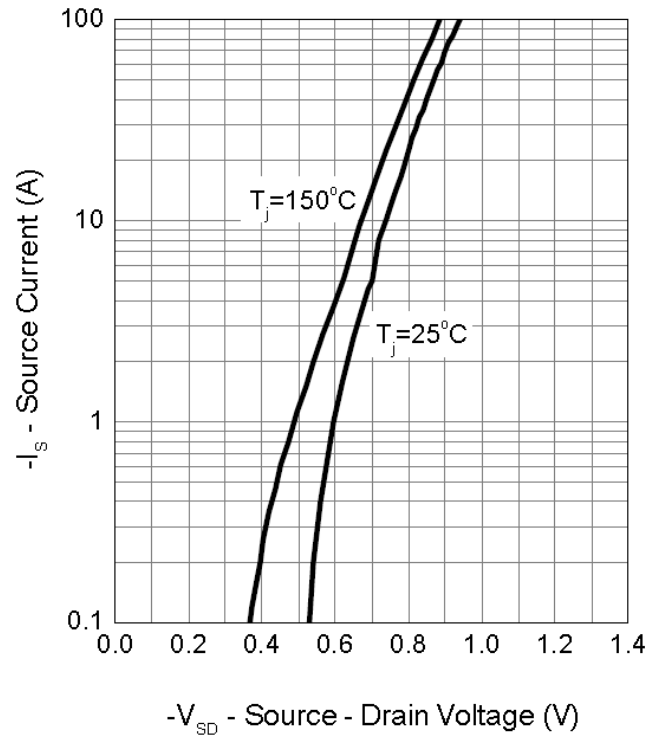


Typical Operating Characteristics (Cont.)

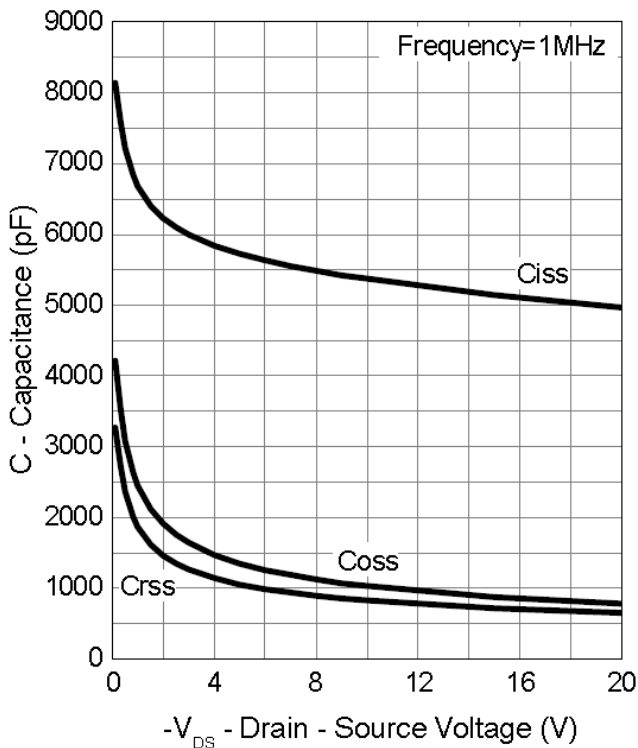
Drain-Source On Resistance



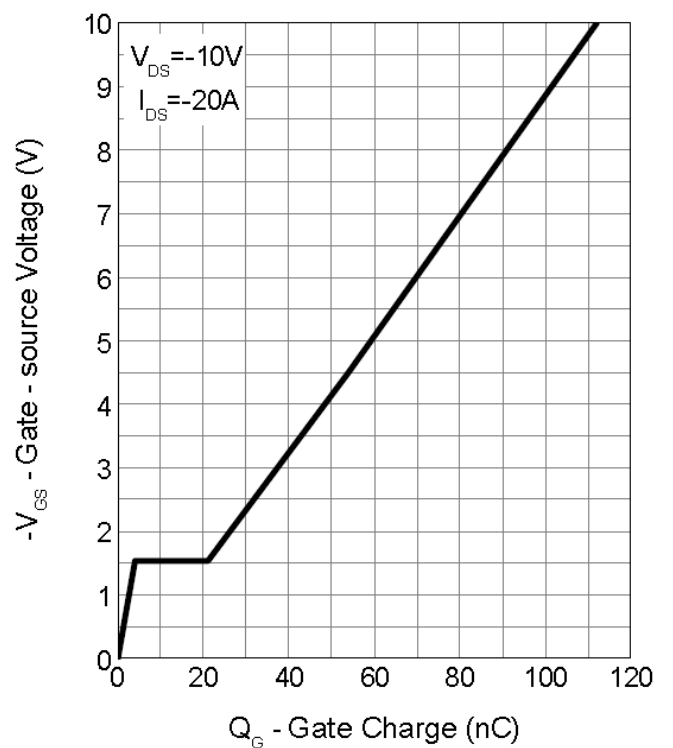
Source-Drain Diode Forward



Capacitance

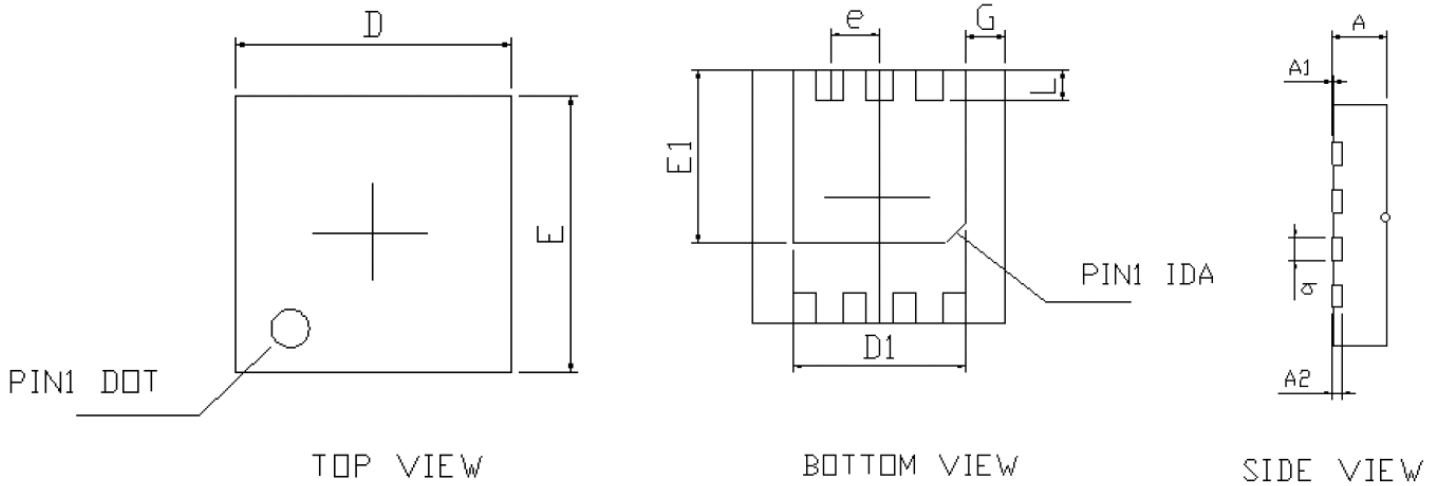


Gate Charge



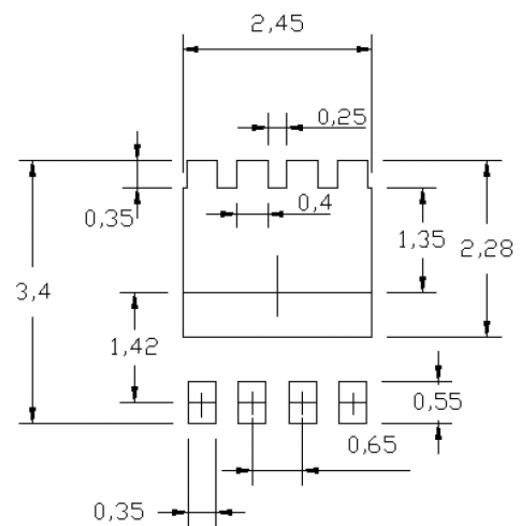
Package Information

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