

P-Channel Enhancement Mode MOSFET **TDM3207**

DESCRIPTION

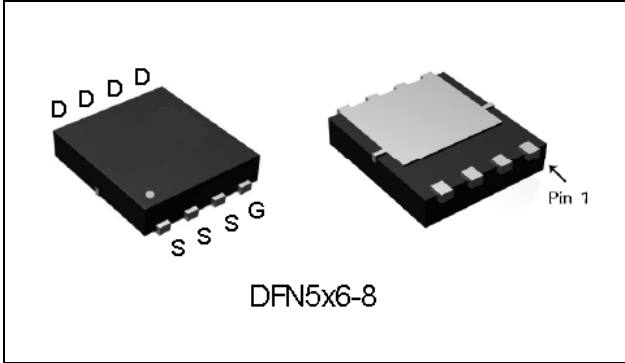
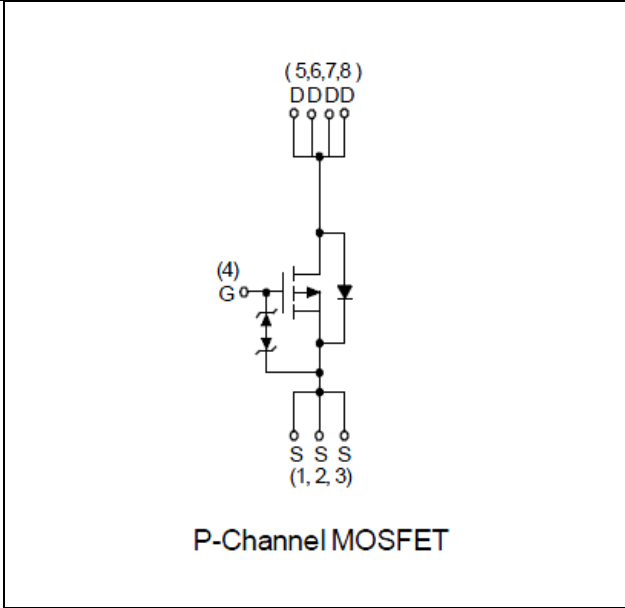
The TDM3207 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

- -20V/-100A
 RDS(ON) <3.6mΩ @ VGS=-2.5V
 RDS(ON) <2.5mΩ @ VGS=-4.5V
 RDS(ON) <2.0mΩ @ VGS=-10V
- ESD Protection
- Surface Mount Package
- Lead Free and Green Devices available(RoHS Compliant)

Application

- Load switch
- Portable Equipment applications
- For E-cigarette battery protection application



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
Drain Current @ Continuous (Note 4)	I _D (T _C =25°C)	-100	A
	I _D (T _C =100°C)	-100	A
Drain Current @ Current-Pulsed (Note 1)	I _{DM} (T _C =25°C)	-400	A
Maximum Power Dissipation	P _D (T _C =25°C)	104	W
	P _D (T _C =100°C)	41.6	
Drain Current @ Continuous	I _D (T _A =25°C)	-26	A
	I _D (T _A =70°C)	-21	A
Maximum Power Dissipation(Note 2)	P _D (T _A =25°C)	2.08	W
	P _D (T _A =70°C)	1.33	
Thermal Resistance,Junction-to-Ambient (Note 2)	R _{θJA} (Steady State)	60	°C/W
Thermal Resistance,Junction-to-Case(Note 5)	R _{θJC} (Steady State)	1.2	°C/W
Maximum Operating Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{STG}	-55 To 150	°C

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ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	-20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-16V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 10	μA
ON CHARACTERISTICS (Note1)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	-0.85	-1.3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-2.5V, I_D=-20A$	-	2.7	3.6	m Ω
		$V_{GS}=-4.5V, I_D=-20A$	-	2.0	2.5	m Ω
		$V_{GS}=-10V, I_D=-20A$	-	1.6	2.0	m Ω
DYNAMIC CHARACTERISTICS (Note3)						
Gate Resistance	R_G	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	2.0	-	Ω
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V, F=1.0MHz$	-	10680	13885	PF
Output Capacitance	C_{oss}		-	2290	-	PF
Reverse Transfer Capacitance	C_{rss}		-	2250	-	PF
SWITCHING CHARACTERISTICS (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-10V, R_L=10\Omega,$ $V_{GEN}=-10V, R_G=6\Omega, I_D=-1A$	-	23	42	nS
Turn-on Rise Time	t_r		-	29	53	nS
Turn-Off Delay Time	$t_{d(off)}$		-	80	144	nS
Turn-Off Fall Time	t_f		-	450	810	nS
Total Gate Charge	Q_g	$V_{DS}=-10V, I_D=-20A, V_{GS}=-4.5V$	-	140	196	nC
Gate-Source Charge	Q_{gs}		-	13	-	nC
Gate-Drain Charge	Q_{gd}		-	50	-	nC
Body Diode Reverse Recovery Time	T_{rr}	$I_F=-20A, di/dt=100A/\mu s$	-	100	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}		-	165	-	nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 2)	V_{SD}	$V_{GS}=0V, I_S=-1A$	-0.3	-0.65	-1.0	V

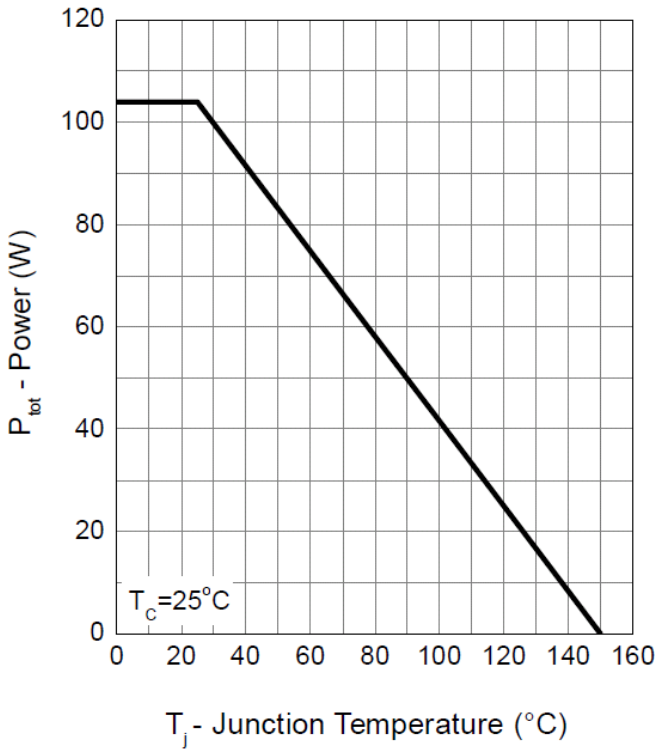
NOTES:

- Pulse width limited by max. junction temperature.
- $R_{\theta JA}$ steady state=999s. $R_{\theta JA}$ is measured with the device mounted on 1in2, Fr-4 board with 2oz.Copper
- Guaranteed by design, not subject to production testing
- Maximum continue current is limited by package.
- $R_{\theta JC}$ steady state $t<0.1s$. It is more useful by using large thermal heat sink and minimizes variation of case temperature w/o cumulative effect of heat. (JESD51-1)

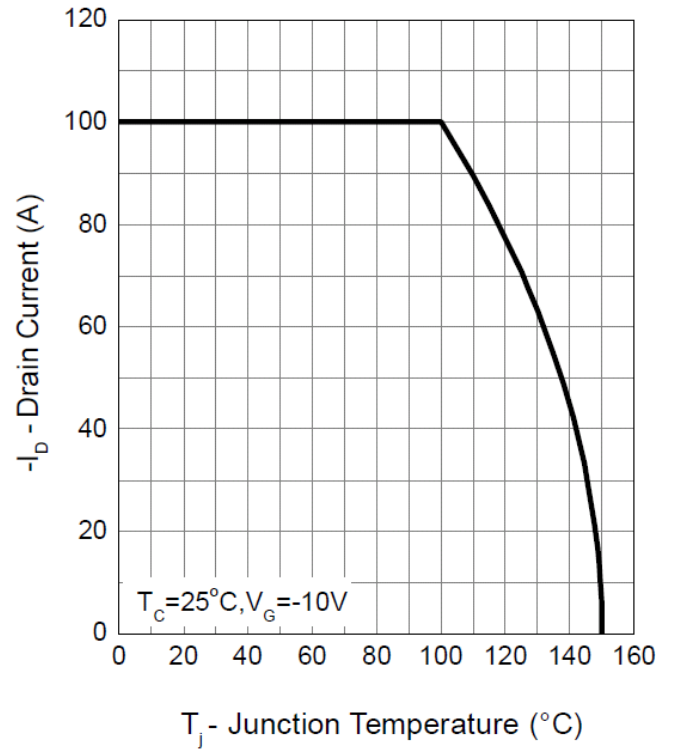
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Typical Operating Characteristics

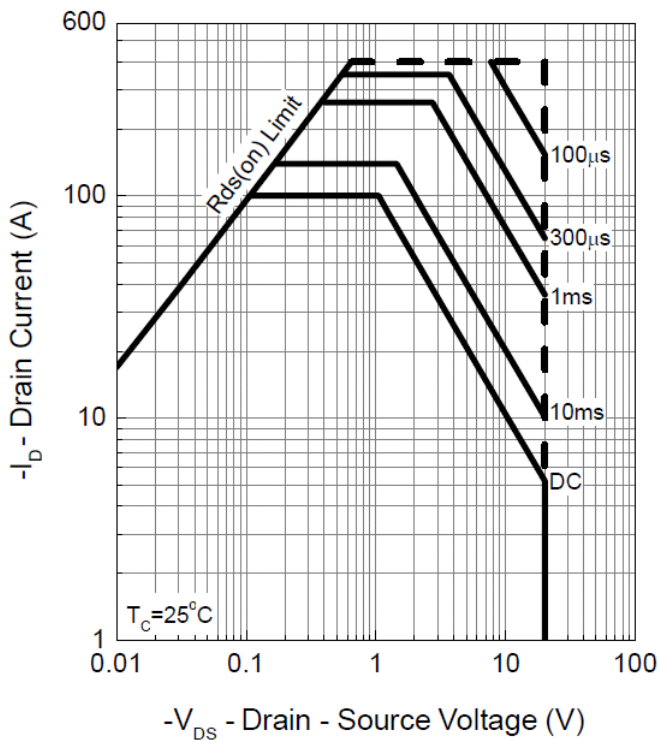
Power Dissipation



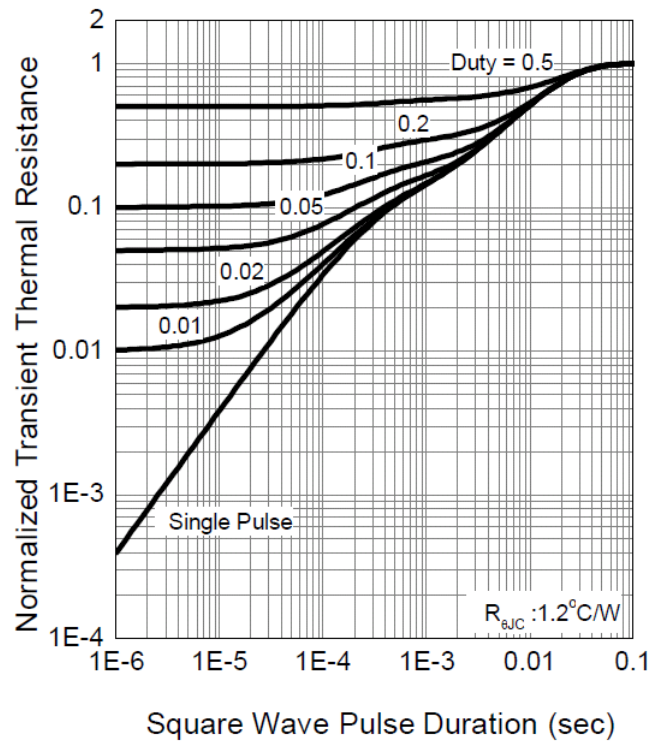
Drain Current



Safe Operation Area



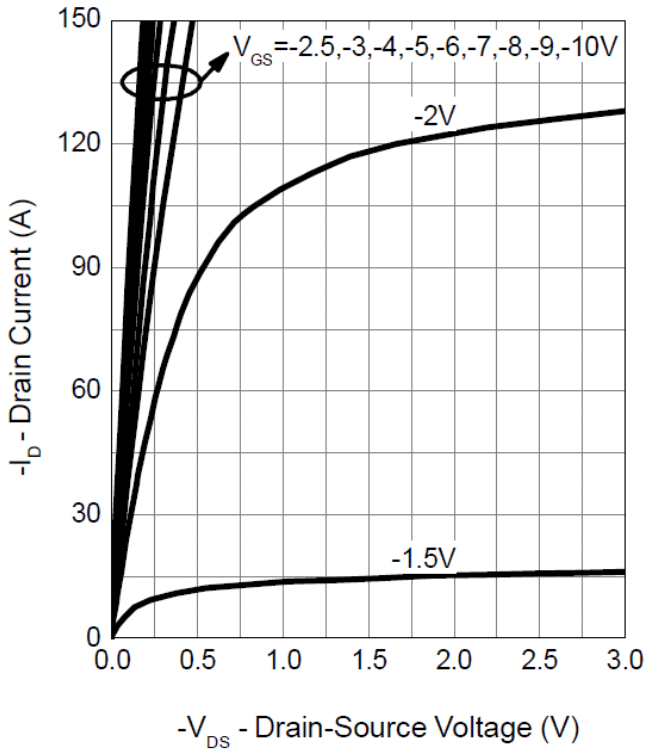
Thermal Transient Impedance



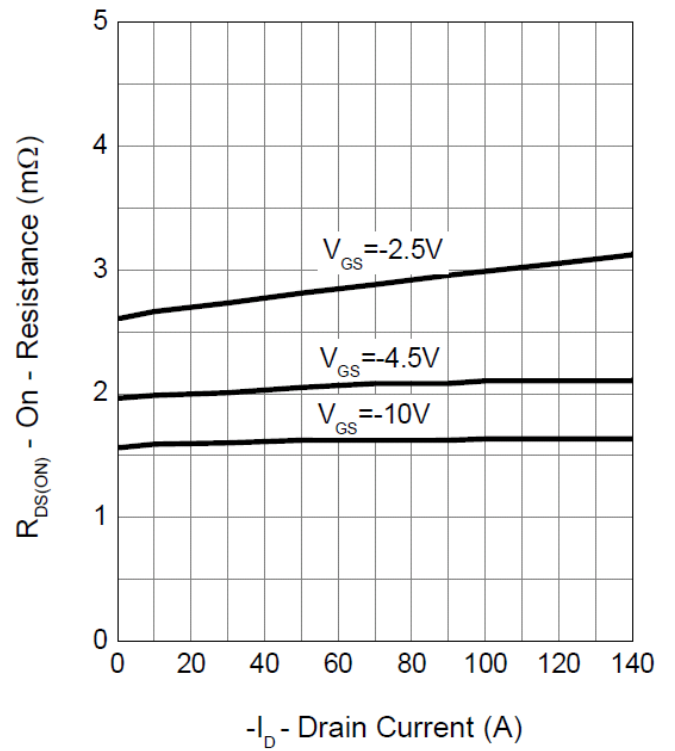
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Typical Operating Characteristics(Cont.)

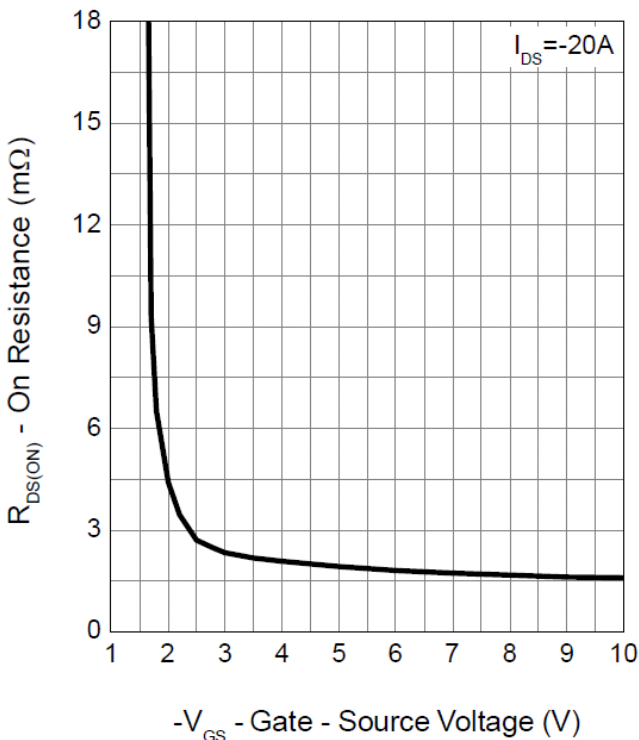
Output Characteristics



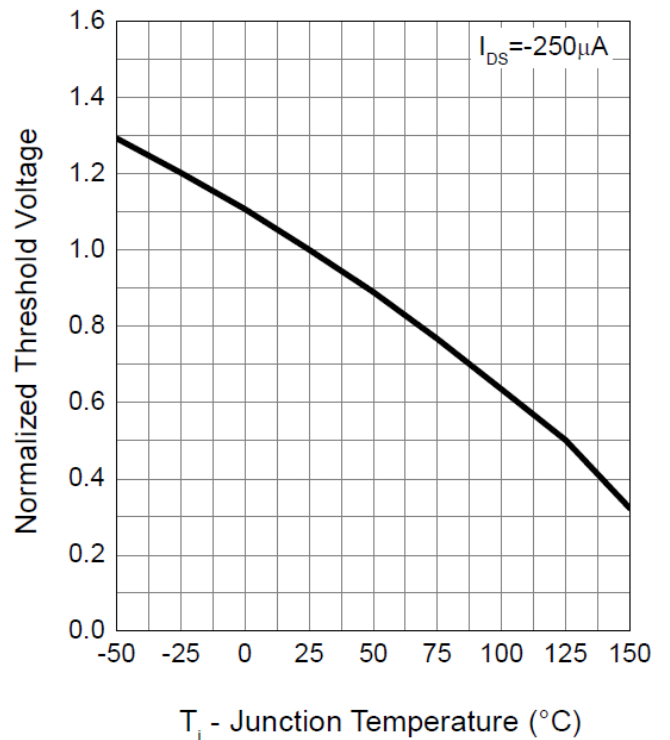
Drain-Source On Resistance



Gate-Source On Resistance



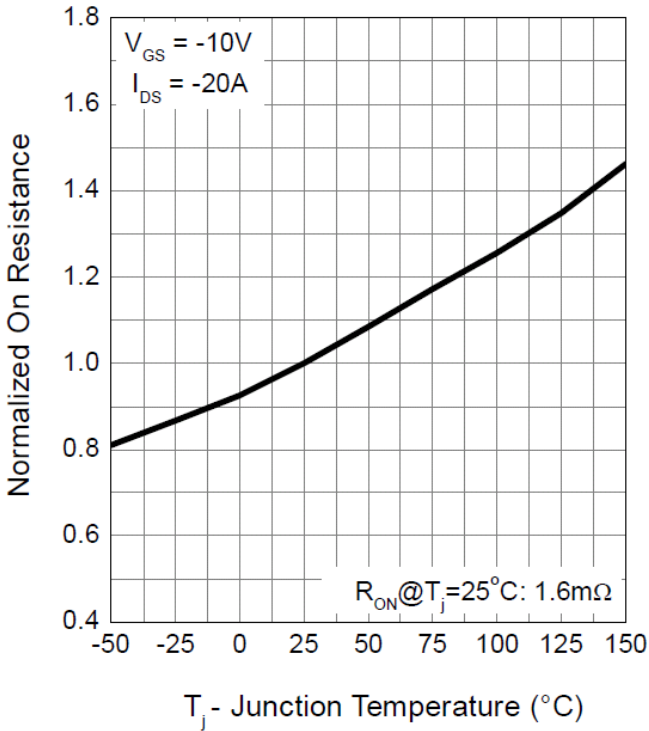
Gate Threshold Voltage



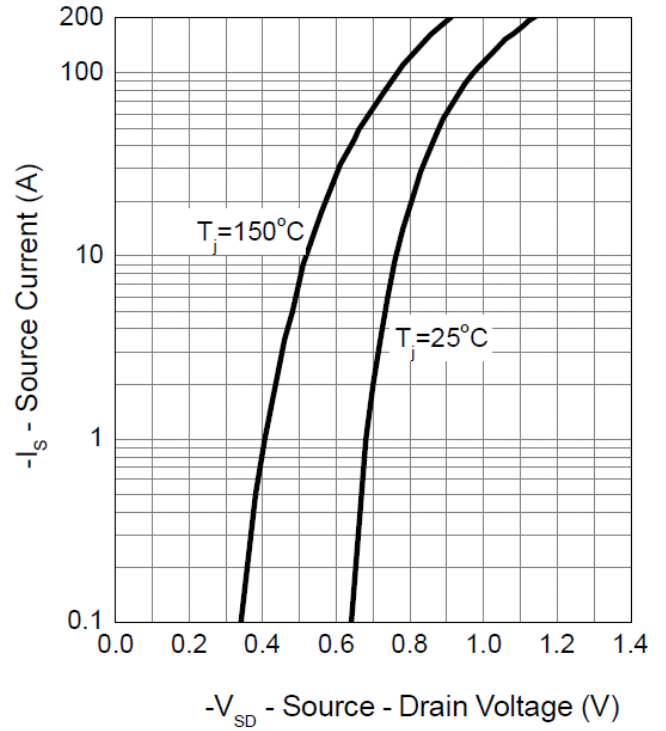
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Typical Operating Characteristics (Cont.)

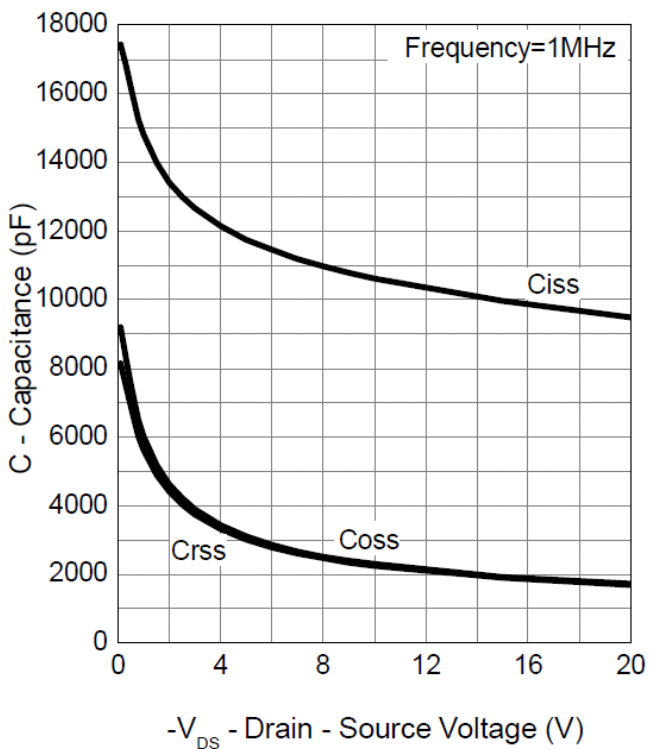
Drain-Source On Resistance



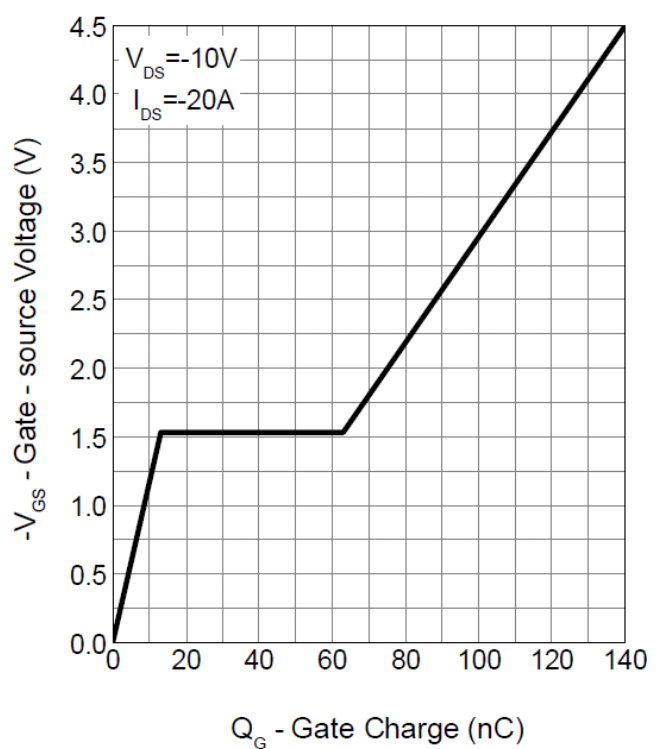
Source-Drain Diode Forward



Capacitance

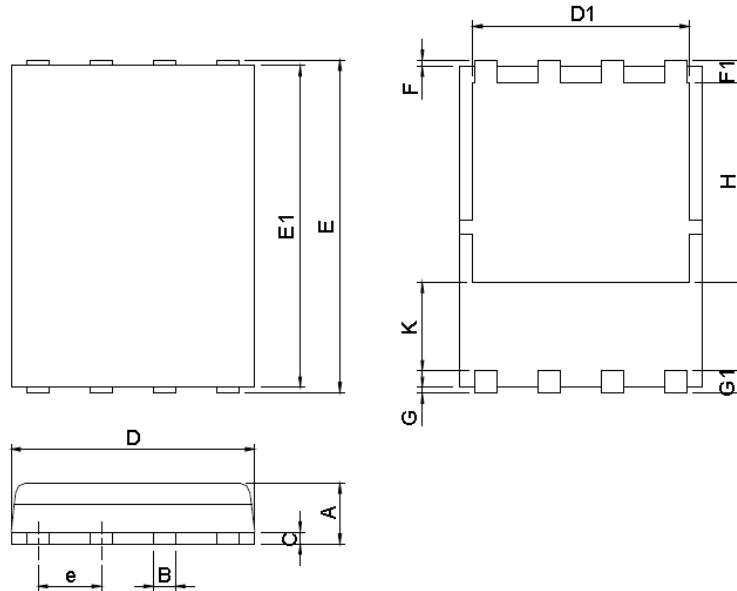


Gate Charge



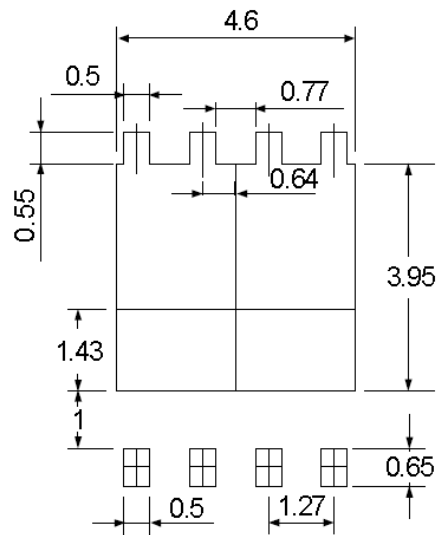
Package Information

DFN5*6-8 Package



DIMENSIONS	DFN5x6-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.90	1.20	0.035	0.047
B	0.3	0.51	0.012	0.020
C	0.19	0.25	0.007	0.010
D	4.80	5.30	0.189	0.209
D1	4.00	4.40	0.157	0.173
E	5.90	6.20	0.232	0.244
E1	5.50	5.80	0.217	0.228
e	1.27 BSC		0.050 BSC	
F	0.05	0.30	0.002	0.012
F1	0.35	0.75	0.014	0.030
G	0.05	0.30	0.002	0.012
G1	0.35	0.75	0.014	0.030
H	3.34	3.9	0.131	0.154
K	0.762	-	0.03	-

RECOMMENDED LAND PATTERN



UNIT: mm

Note : 1.Dimension D, D1,D2 and E1 do not include mold flash or protrusions.
Mold flash or protrusions shall not exceed 10 mil.

Design Notes