

N-Channel Enhancement Mode MOSFET

TDM3550

**DESCRIPTION**

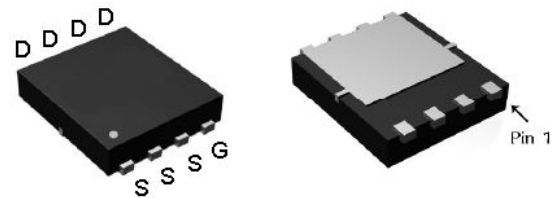
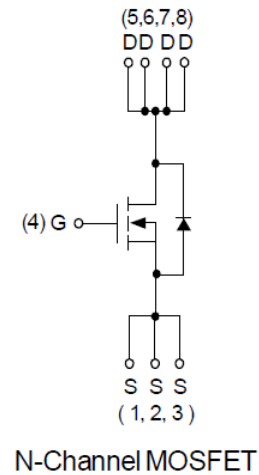
The TDM3550 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.

**GENERAL FEATURES**

- 40V/100A  
RDS(ON) <1.35mΩ @ VGS=10V
- High Power and current handling capability
- Surface Mount Package
- Lead Free and Green Devices available(RoHS Compliant)

**Application**

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



DFN5x6-8

泰德半导体--提供样品, 技术支持 手机13418601901 QQ409545144

**ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)**

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current @ Continuous (Note 4)	I <sub>D</sub> (T <sub>C</sub> =25°C)	100	A
	I <sub>D</sub> (T <sub>C</sub> =100°C)	100	A
Drain Current @ Current-Pulsed (Note 1)	I <sub>DM</sub> (T <sub>C</sub> =25°C)	400	A
Maximum Power Dissipation (Note 5、6)	P <sub>D</sub> (T <sub>C</sub> =25°C)	150	W
	P <sub>D</sub> (T <sub>C</sub> =100°C)	75	
Drain Current @ Continuous (Note 2)	I <sub>D</sub> (T <sub>A</sub> =25°C)	36	A
	I <sub>D</sub> (T <sub>A</sub> =70°C)	30	A
Maximum Power Dissipation(Note 2)	P <sub>D</sub> (T <sub>A</sub> =25°C)	2.72	W
	P <sub>D</sub> (T <sub>A</sub> =70°C)	1.9	
Thermal Resistance,Junction-to-Ambient (Note 2)	R <sub>θJA</sub> (t <sub>s</sub> ≤10s)	17	°C/W
	R <sub>θJA</sub> (Steady State)	55	
Thermal Resistance,Junction-to-Case(Note 5)	R <sub>θJC</sub> (Steady State)	1	°C/W
Maximum Operating Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 To 150	°C

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

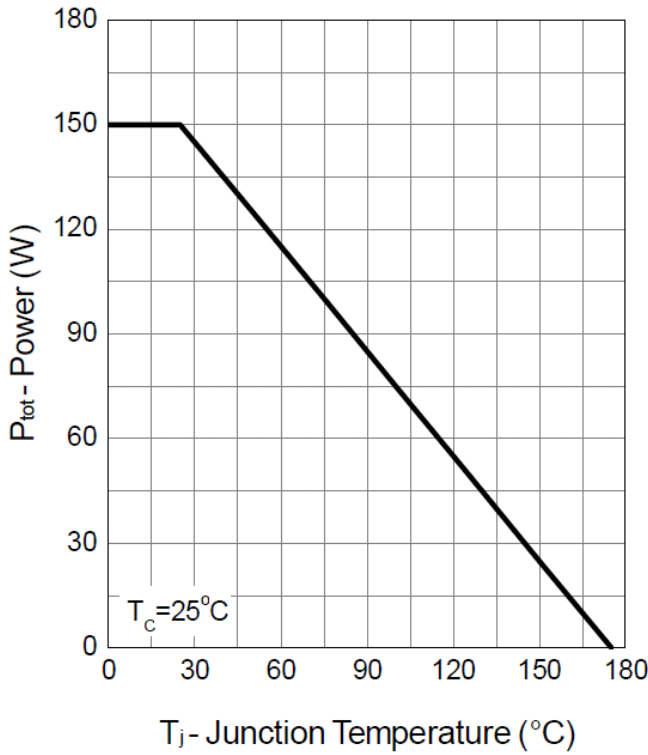
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=32V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=25A$	-	1.1	1.35	m $\Omega$
			$T_J=125^{\circ}\text{C}$	-	1.95	
<b>DYNAMIC CHARACTERISTICS</b> (Note3)						
Gate Resistance	$R_G$	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	0.6	1	2	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=20V, V_{GS}=0V, F=1.0\text{MHz}$	-	5020	-	PF
Output Capacitance	$C_{oss}$		-	1770	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	150	-	PF
<b>SWITCHING CHARACTERISTICS</b> (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=20V, R_L=20\Omega, V_{GEN}=10V, R_G=6\Omega$ $I_D=1A$	-	30	-	nS
Turn-on Rise Time	$t_r$		-	11.2	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	66	-	nS
Turn-Off Fall Time	$t_f$		-	108	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=20V, I_D=20A, V_{GS}=10V$	-	64	-	nC
Gate-Source Charge	$Q_{gs}$		-	22	-	nC
Gate-Drain Charge	$Q_{gd}$		-	6	-	nC
Body Diode Reverse Recovery Time	$T_{rr}$	$I_F=20A, di/dt=100A/\mu s$	-	60	-	nS
Body Diode Reverse Recovery Charge	$Q_{rr}$		-	70	-	nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode Forward Voltage (Note 2)	$V_{SD}$	$V_{GS}=0V, I_S=20A$	-	0.77	1.1	V

## NOTES:

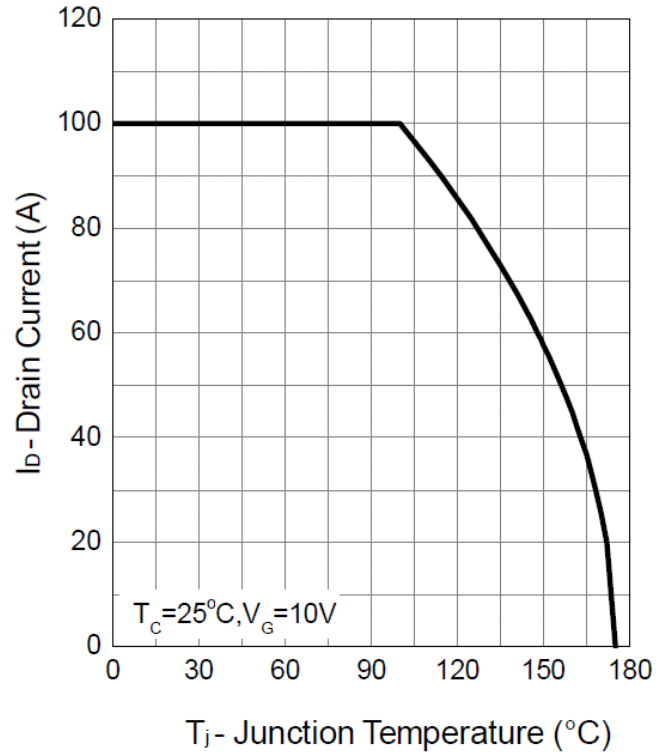
- Pulse width limited by max. junction temperature.
- $R_{\theta JA}$  steady state=999s.  $R_{\theta JA}$  is measured with the device mounted on 1in2, Fr-4 board with 2oz.Copper
- Guaranteed by design, not subject to production testing
- Maximum continue current is limited by package and equal to 100A.
- $R_{\theta JC}$  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)
- Power dissipation ( $T_c$ ) is based on  $R_{\theta JC}$  and the maximum junction temperature is equal to  $175^{\circ}\text{C}$ .

Typical Operating Characteristics

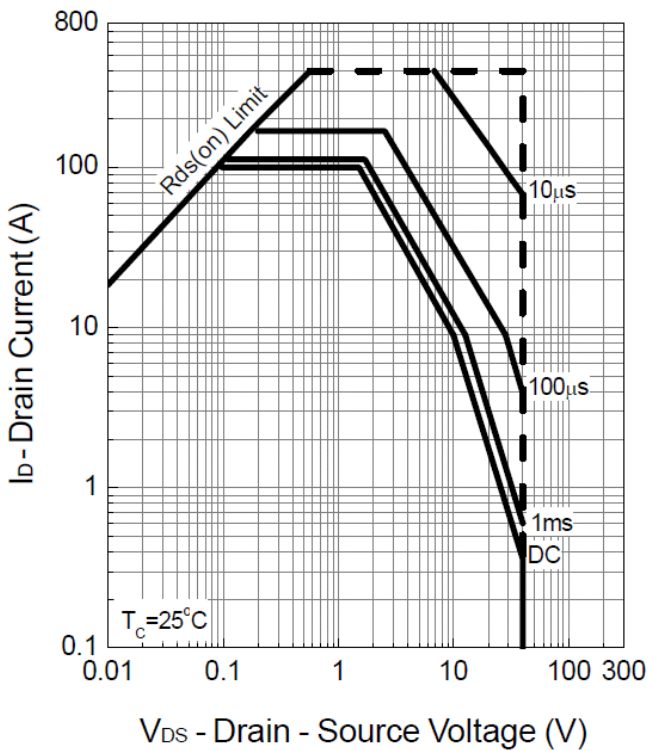
Power Dissipation



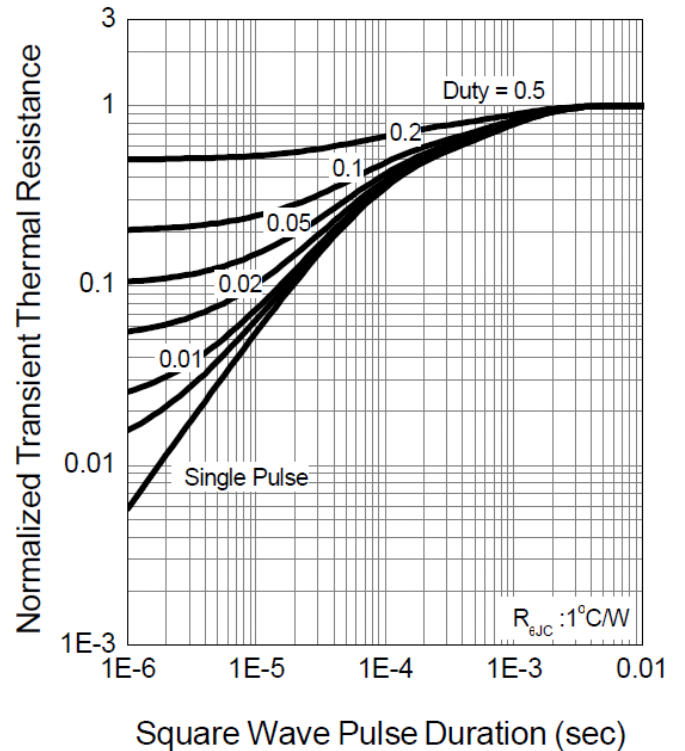
Drain Current



Safe Operation Area

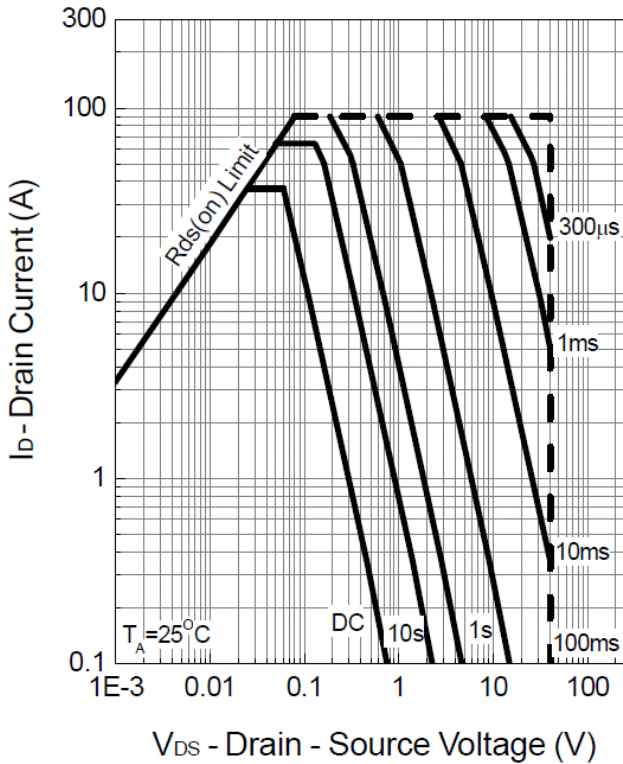


Thermal Transient Impedance

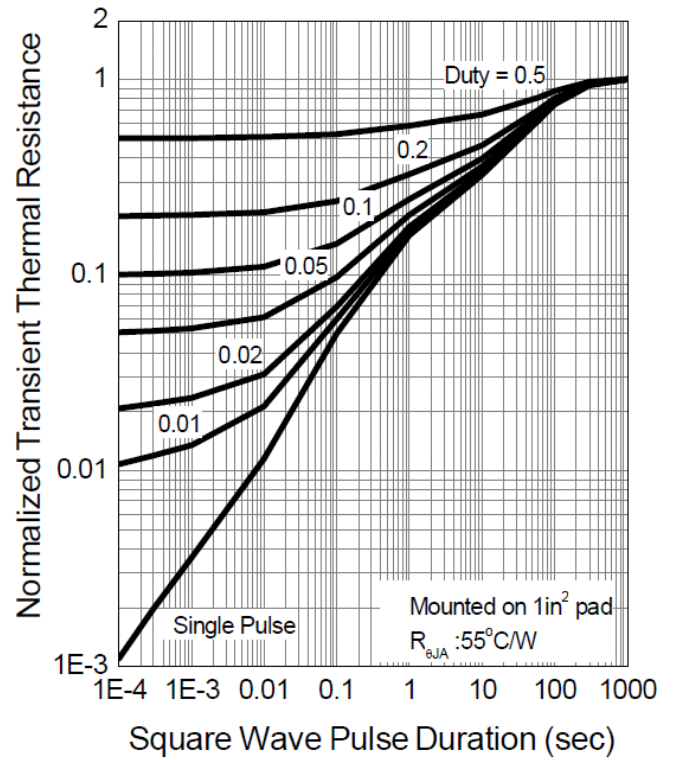


Typical Operating Characteristics(Cont.)

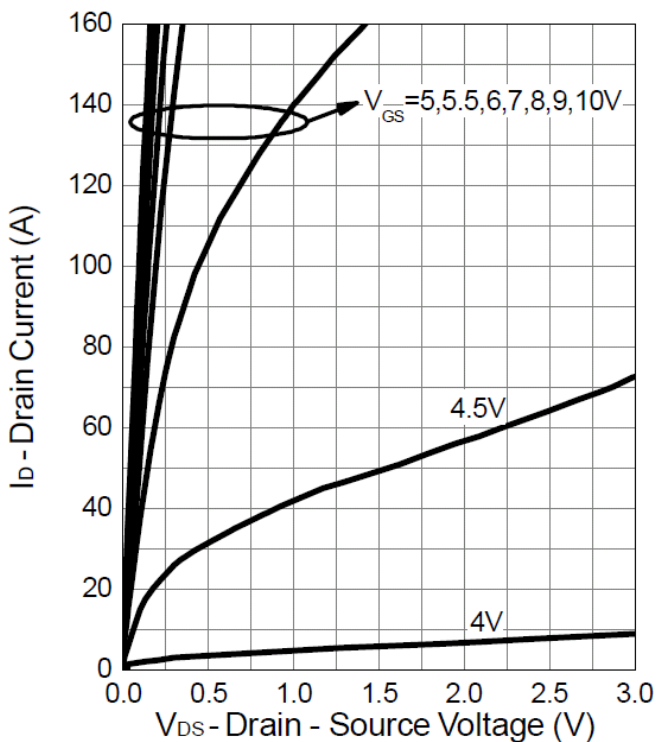
Safe Operation Area



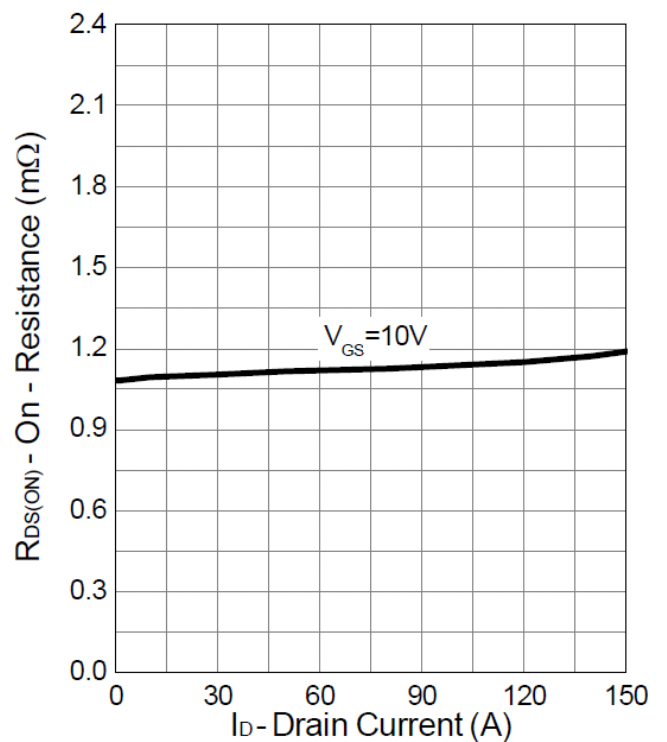
Thermal Transient Impedance



Output Characteristics



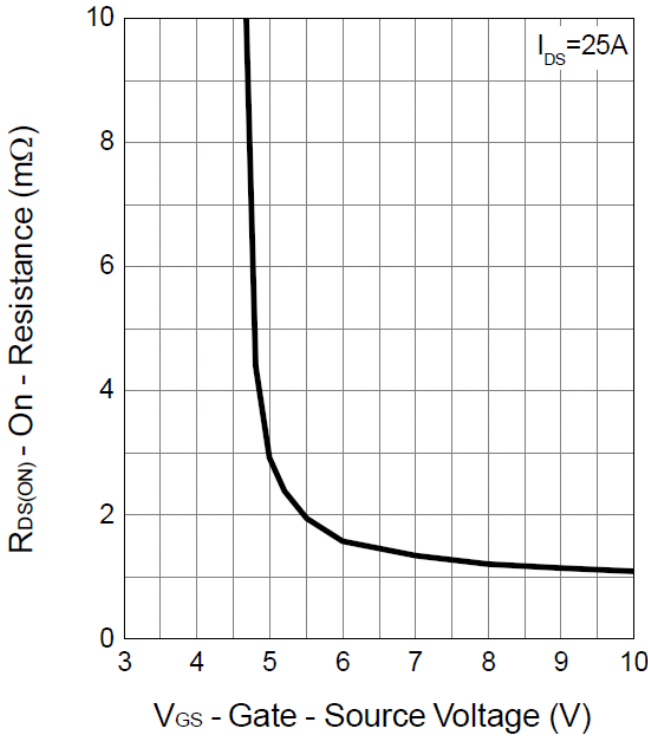
Drain-Source On Resistance



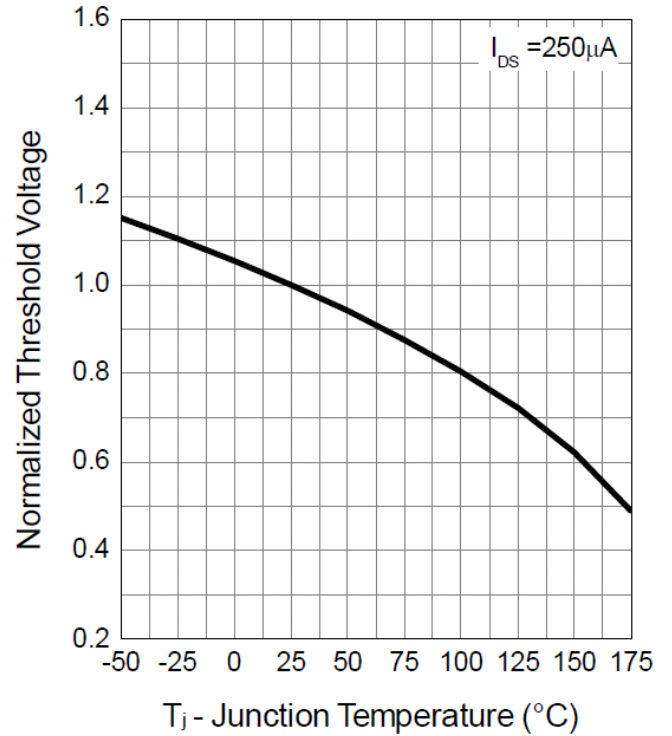
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Typical Operating Characteristics (Cont.)

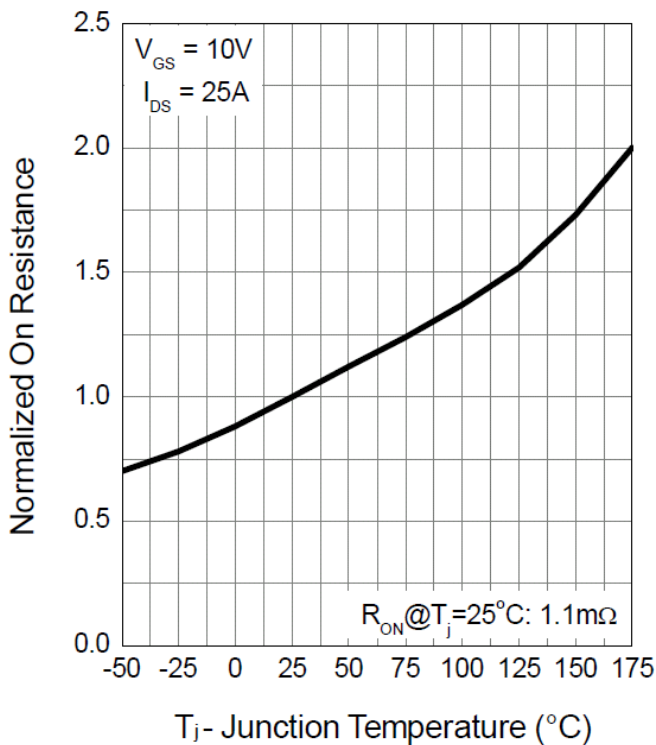
Gate-Source On Resistance



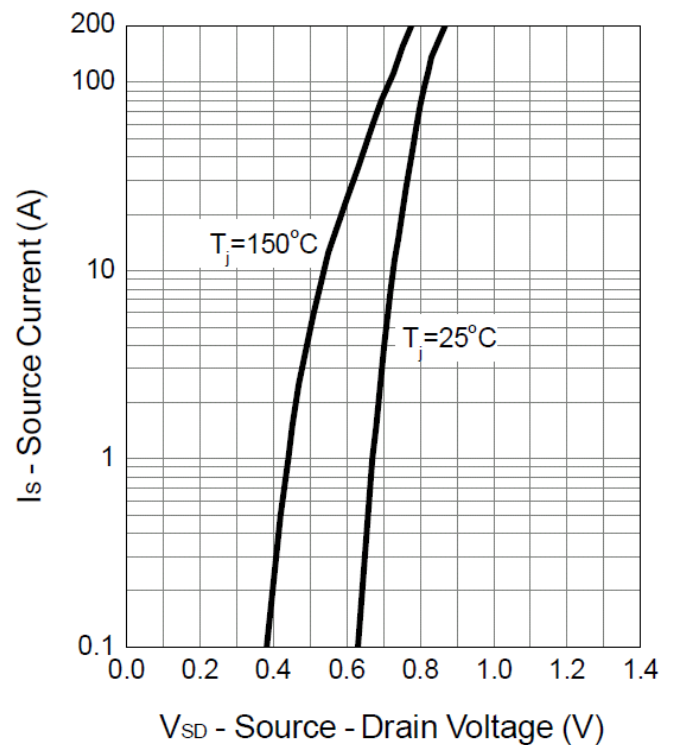
Gate Threshold Voltage



Drain-Source On Resistance

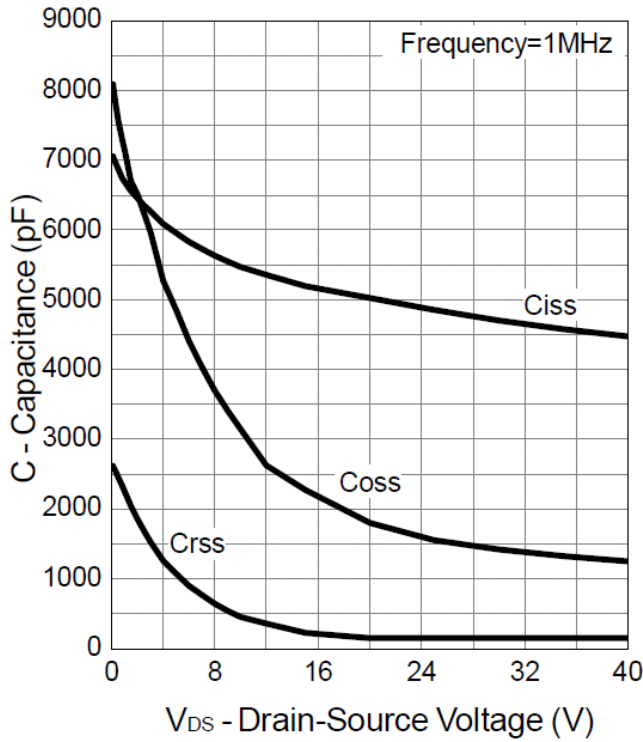


Source-Drain Diode Forward

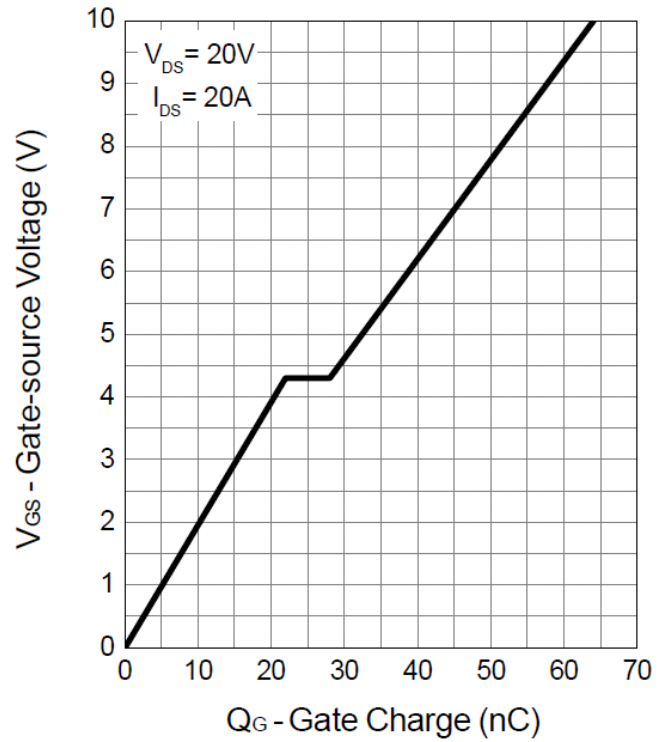


Typical Operating Characteristics (Cont.)

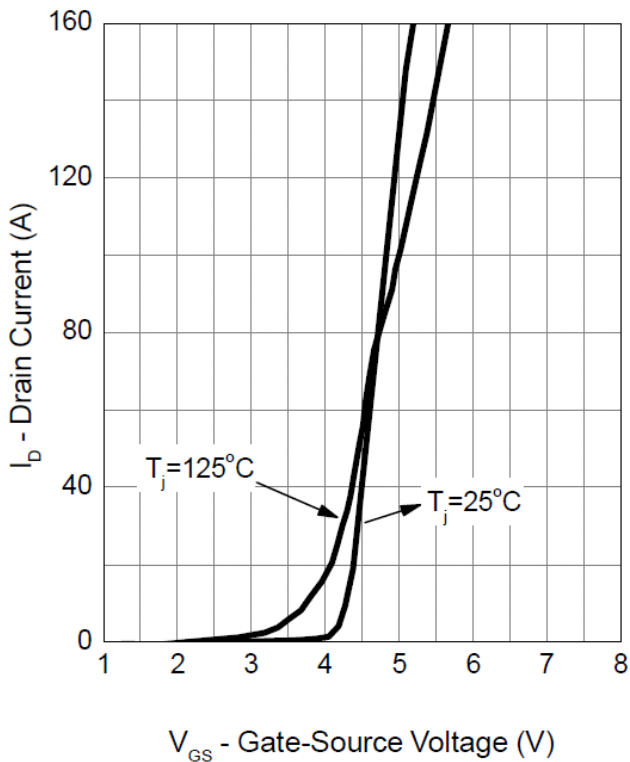
Capacitance



Gate Charge

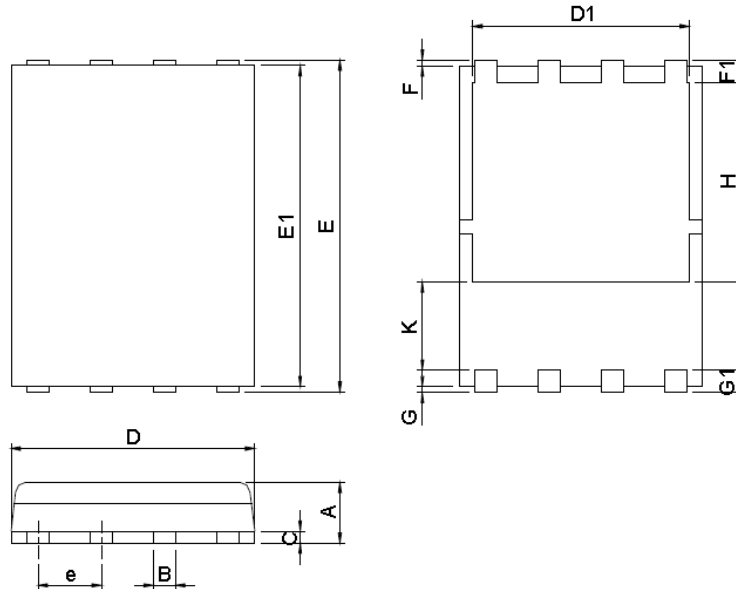


Transfer Characteristics



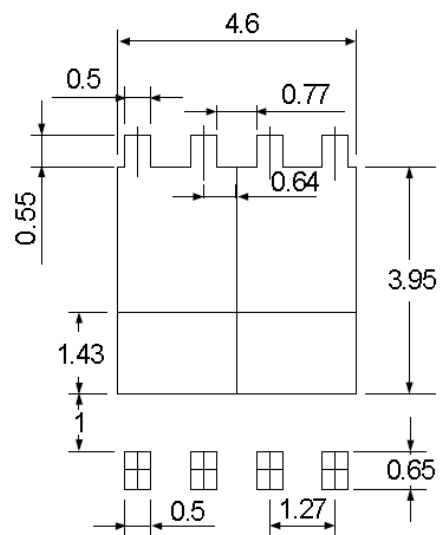
Package Information

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