

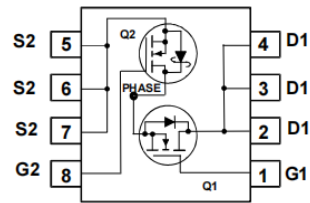
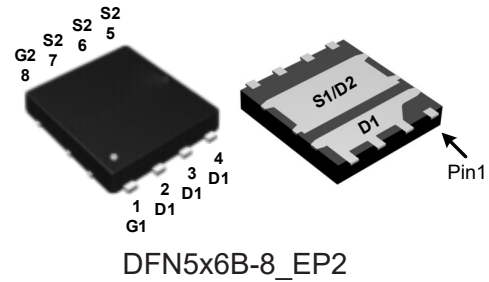
Features

- Channel 1**
30V/30A
 $R_{DS(ON)} = 4m\Omega (typ.) @ V_{GS} = 10V$
 $R_{DS(ON)} = 6m\Omega (typ.) @ V_{GS} = 4.5V$
- Channel 2**
30V/60A
 $R_{DS(ON)} = 1.3m\Omega (typ.) @ V_{GS} = 10V$
 $R_{DS(ON)} = 1.5m\Omega (typ.) @ V_{GS} = 4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- Power Management in Desktop Computer or DC/DC Converters.

Pin Description



Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		Channel 1		Channel 2	Unit
Common Ratings						
V _{DSS}	Drain-Source Voltage		30			V
V _{GSS}	Gate-Source Voltage		±20		±20	V
T _J	Maximum Junction Temperature		150			°C
T _{STG}	Storage Temperature Range		-55 to 150			°C
I _S	Diode Continuous Forward Current	T _C =25°C	30		60	A
I _D	Continuous Drain Current	T _C =25°C	30		60	A
		T _C =100°C	23		46	
I _{DM} ^b	Pulse Drain Current	T _C =25°C	90		180	A
P _D	Maximum Power Dissipation	T _C =25°C	46		69	W
		T _C =100°C	19		28	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	2.7		1.8	°C/W
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤10s	36		28	°C/W
		Steady State	72		66	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.1mH	25		40	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.1mH	31		80	mJ

Note a : Maximum continuous current is limited by bonding wire.

Note b : Pulse width is limited by maximum junction temperature.

Note c : Surface mounted on 1in^2 pad area, steady state $t = 999\text{s}$.

Note d : UIS tested and pulse width are limited by maximum junction temperature (initial temperature $T_J=25^{\circ}\text{C}$).

Channel 1 Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Channel 1			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.2	1.9	2.7	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^e	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =11A	-	4	8	mΩ
		T _J =125°C	-	6.8	-	
		V _{GS} =4.5V, I _{DS} =6.5A	-	6	10	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =6.5A	-	13.5	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =5A, V _{GS} =0V	-	0.75	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =11A, dI _{SD} /dt=100A/μs	-	22	-	ns
t _a	Charge Time		-	9	-	
t _b	Discharge Time		-	13	-	
Q _{rr}	Reverse Recovery Charge		-	9	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	2	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	1320	1840	pF
C _{oss}	Output Capacitance		-	460	-	
C _{rss}	Reverse Transfer Capacitance		-	45	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	10.5	19	ns
t _r	Turn-on Rise Time		-	9.5	18	
t _{d(OFF)}	Turn-off Delay Time		-	21	38	
t _f	Turn-off Fall Time		-	18	33	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =11A	-	11	15.4	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =11A	-	5.5	-	
Q _{gth}	Threshold Gate Charge		-	1.3	-	
Q _{gs}	Gate-Source Charge		-	2	-	
Q _{gd}	Gate-Drain Charge		-	1.2	-	

Note e : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note f : Guaranteed by design, not subject to production testing.

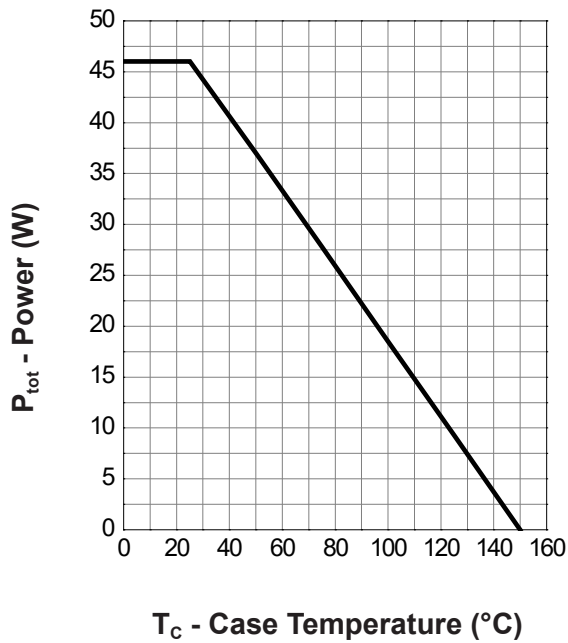
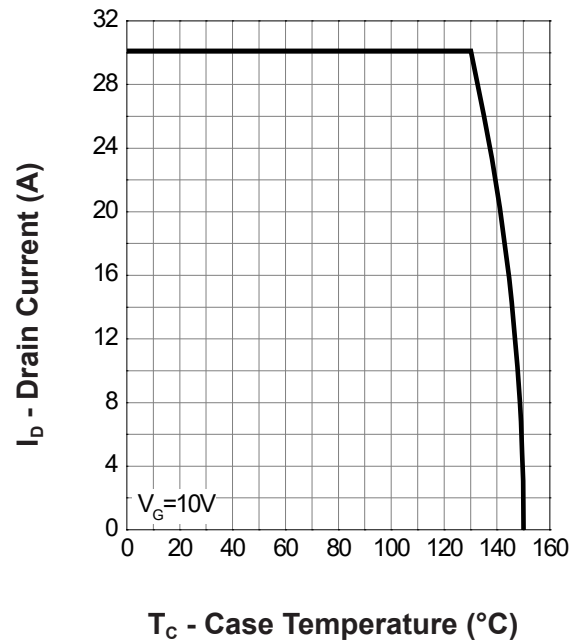
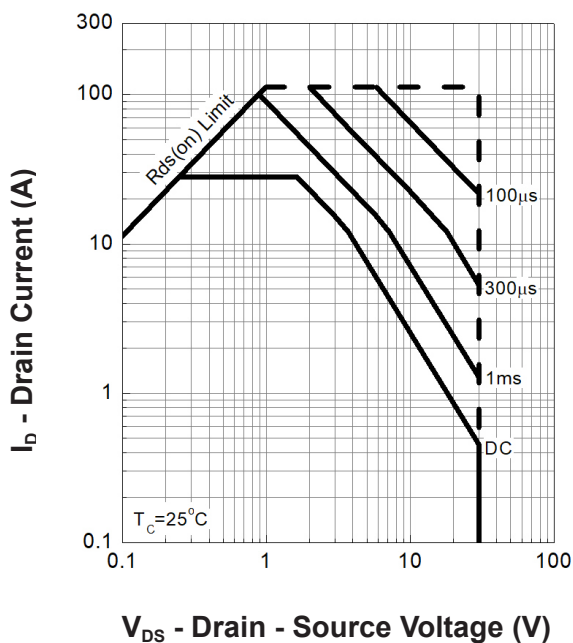
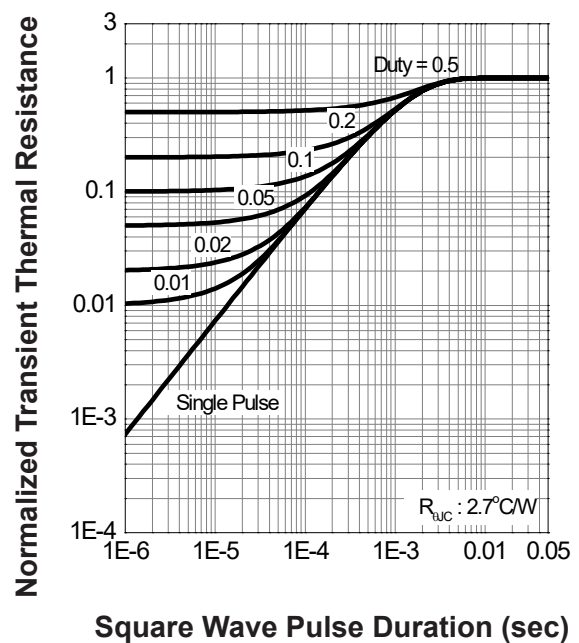
Channel 2 Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Channel 2			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.1	1.6	2.2	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^e	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =20A	-	1.3	1.8	mΩ
		T _J =125°C	-	2.3	-	
		V _{GS} =4.5V, I _{DS} =15A	-	1.5	2.2	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =15A	-	33.5	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.75	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =20A, dI _{SD} /dt=100A/μs	-	40	-	ns
t _a	Charge Time		-	23	-	
t _b	Discharge Time		-	17	-	
Q _{rr}	Reverse Recovery Charge		-	31	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.3	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	4132	5795	pF
C _{oss}	Output Capacitance		-	910	-	
C _{rss}	Reverse Transfer Capacitance		-	125	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	15.5	28	ns
t _r	Turn-on Rise Time		-	11.5	21	
t _{d(OFF)}	Turn-off Delay Time		-	41	74	
t _f	Turn-off Fall Time		-	48	87	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =20A	-	28	42	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =20A	-	13	19.5	
Q _{gth}	Threshold Gate Charge		-	3.8	-	
Q _{gs}	Gate-Source Charge		-	5.4	-	
Q _{gd}	Gate-Drain Charge		-	2.1	-	

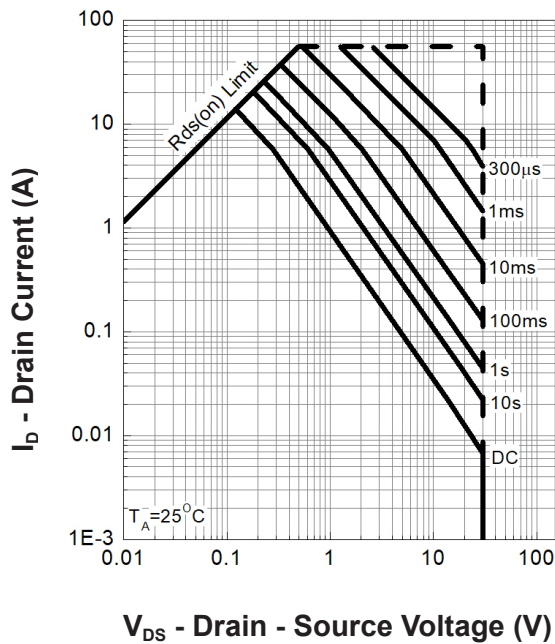
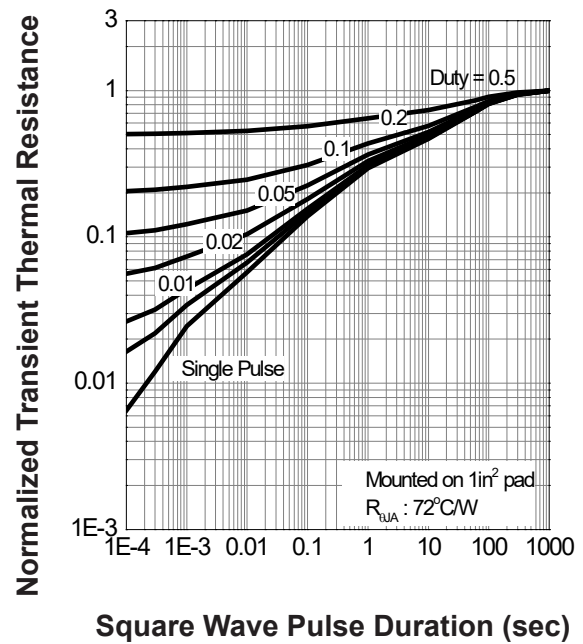
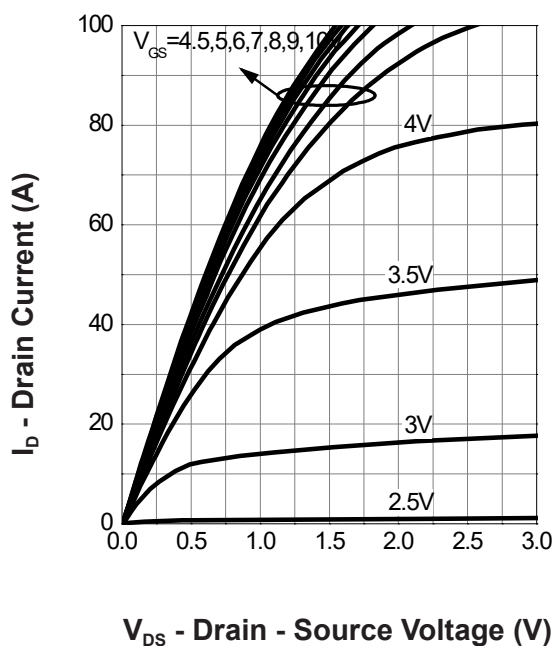
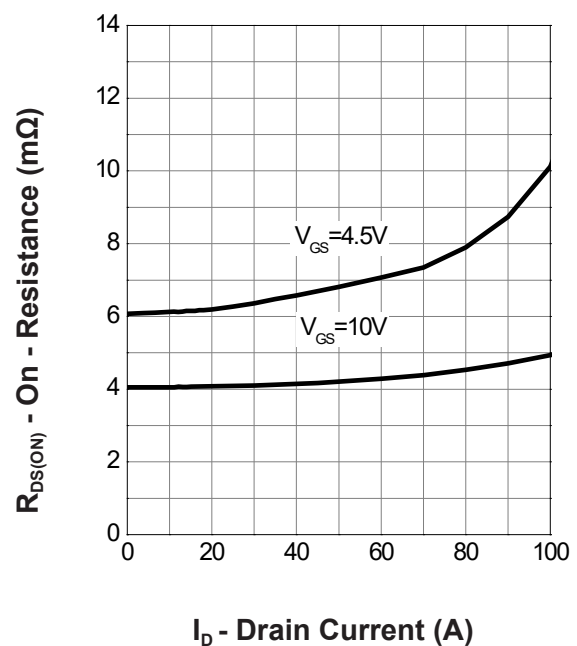
Note e : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note f : Guaranteed by design, not subject to production testing.

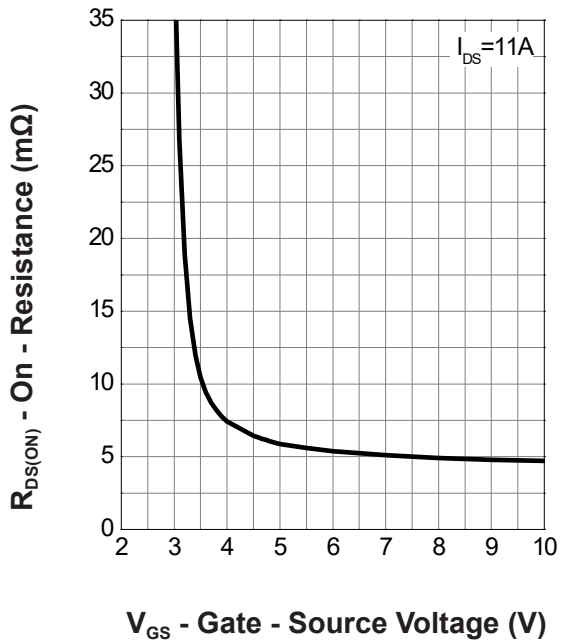
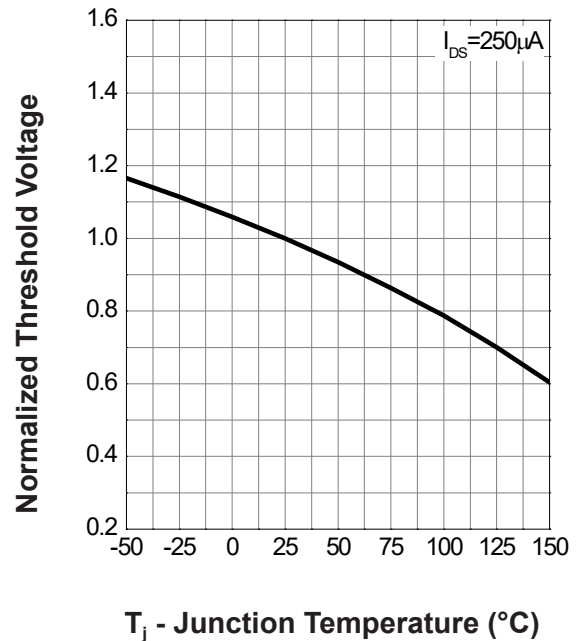
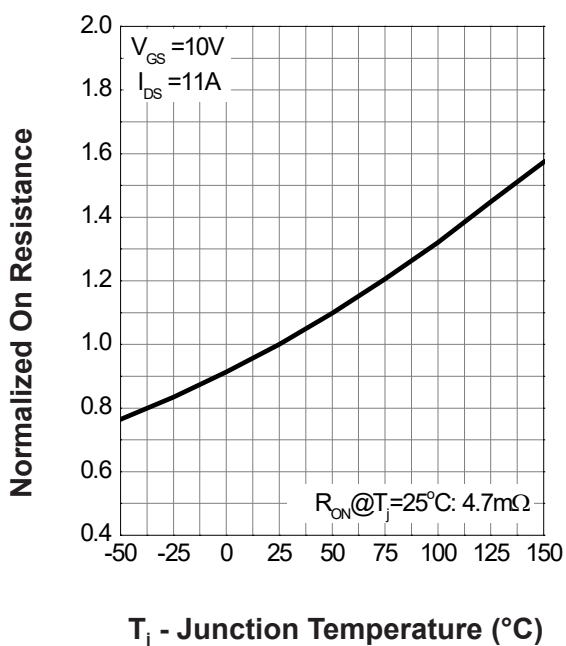
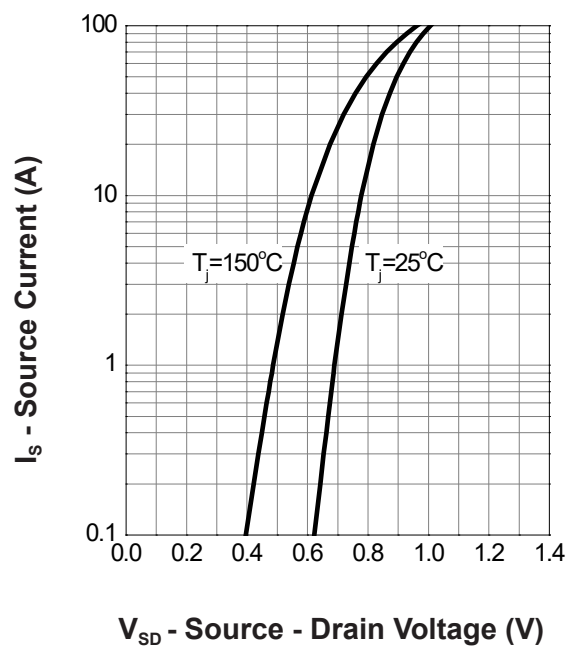
Channel 1 Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


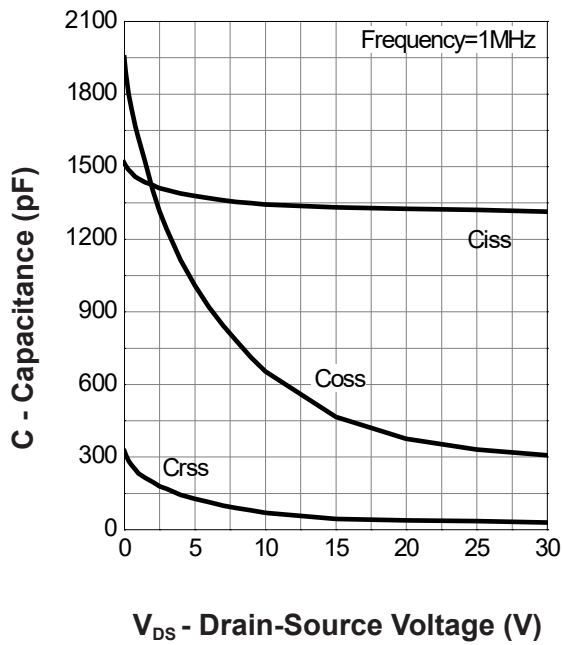
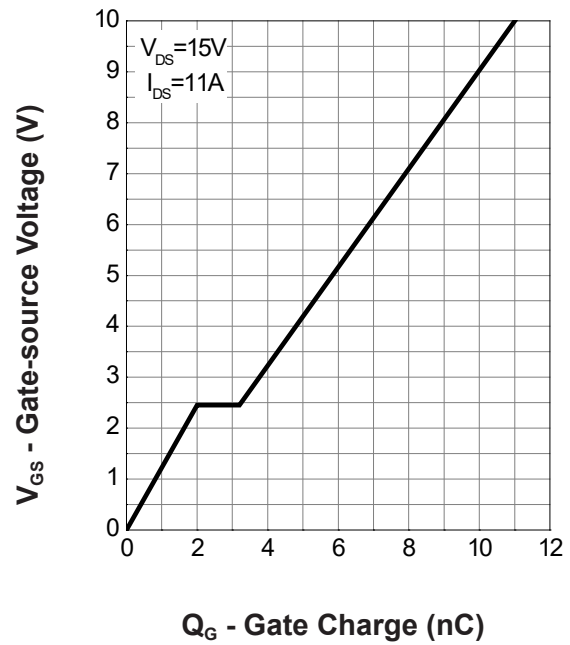
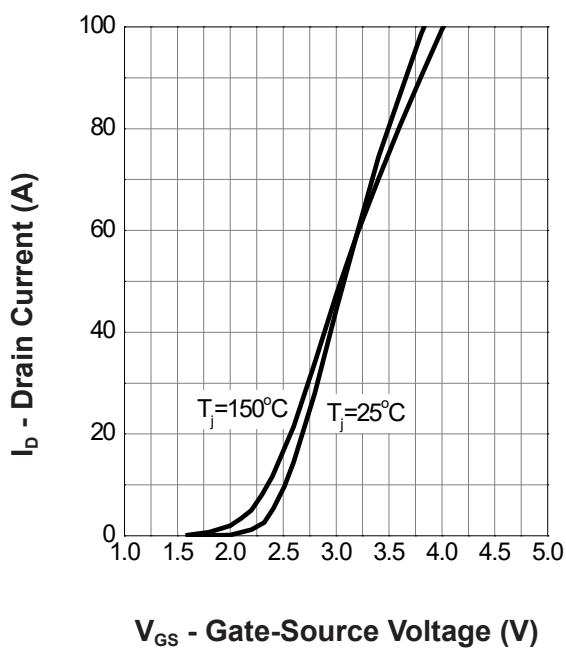
Channel 1 Typical Operating Characteristics(Cont.)

Safe Operation Area

Thermal Transient Impedance

Output Characteristics

Drain-Source On Resistance


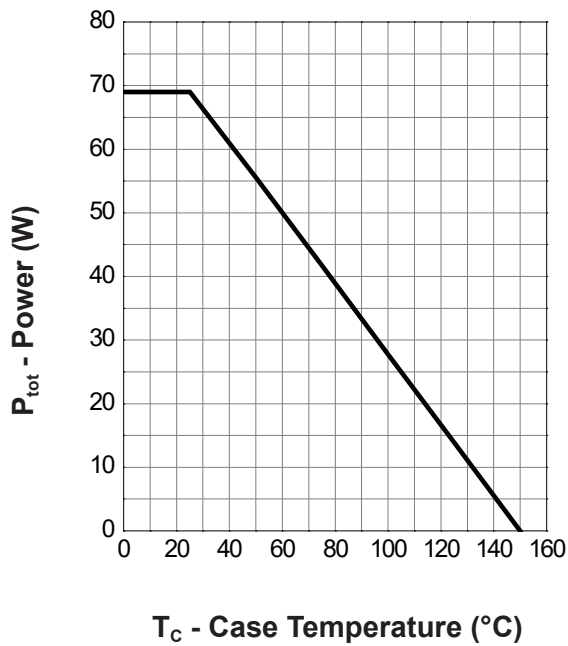
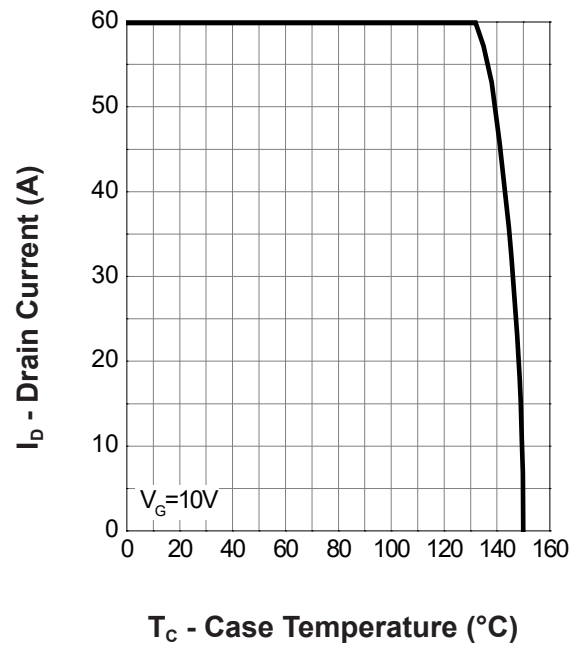
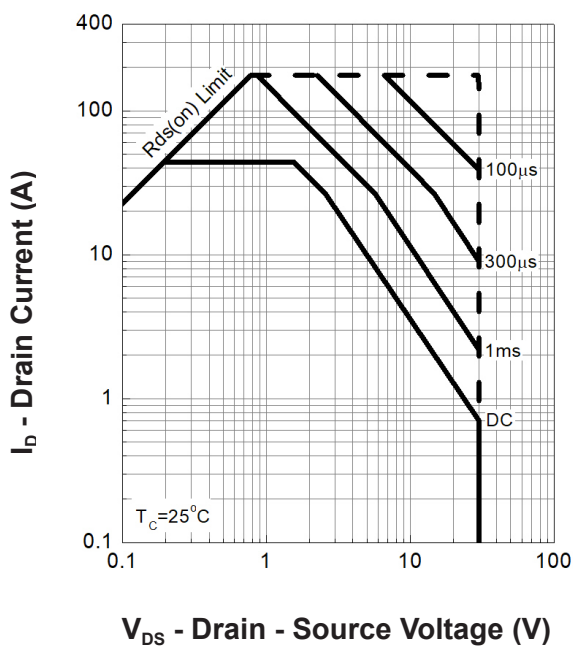
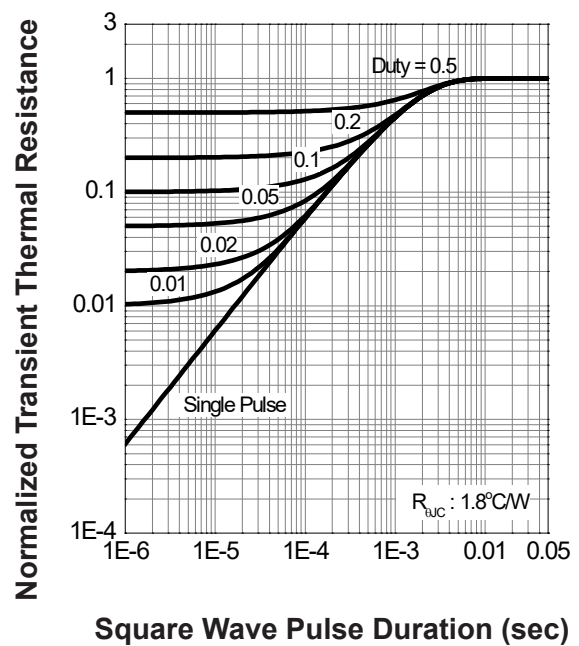
Channel 1 Typical Operating Characteristics(Cont.)

Gate-Source On Resistance

Gate Threshold Voltage

Drain-Source On Resistance

Source-Drain Diode Forward


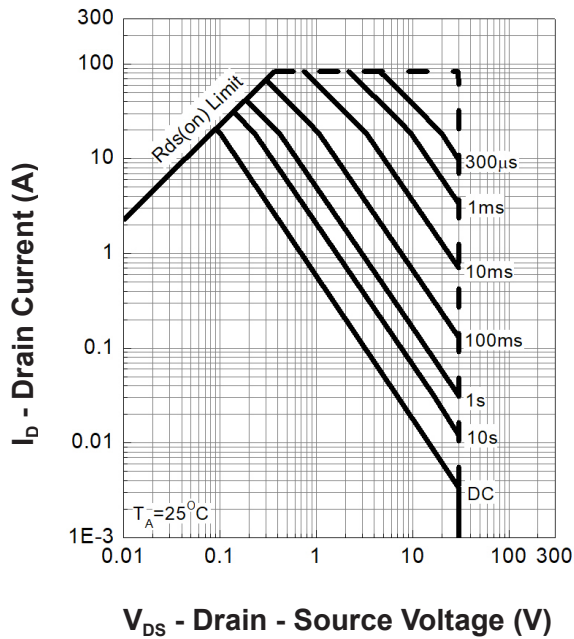
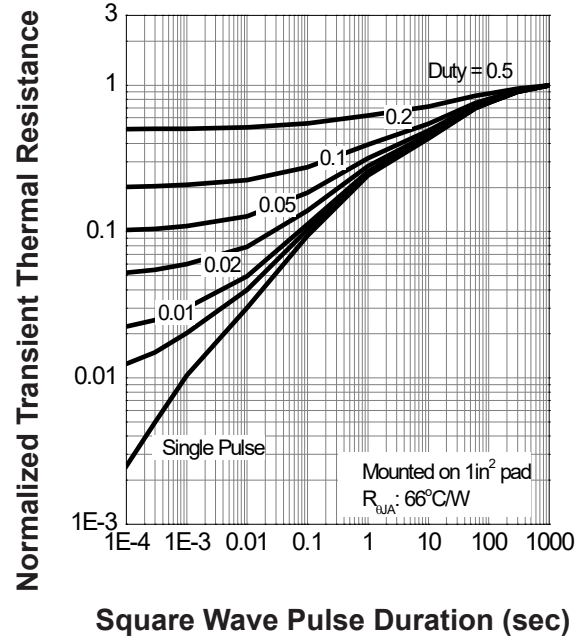
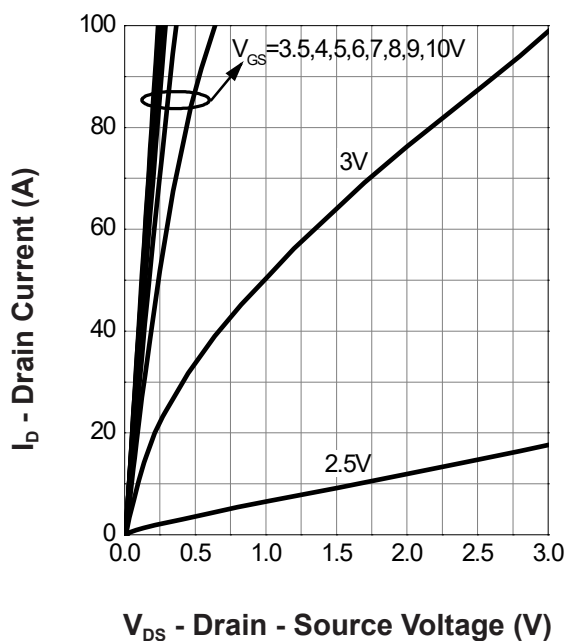
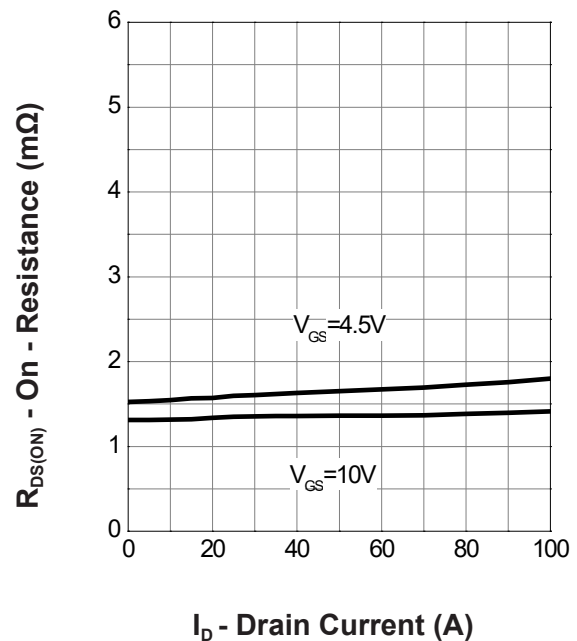
Channel 1 Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Transfer Characteristics


Channel 2 Typical Operating Characteristics

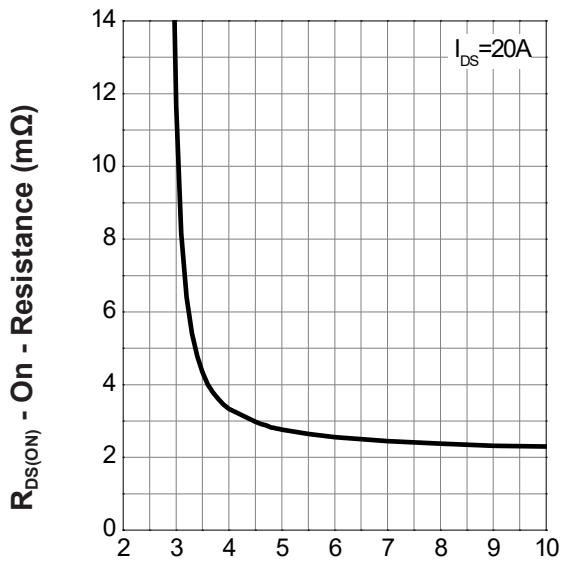
Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


Channel 2 Typical Operating Characteristics(Cont.)

Safe Operation Area

Thermal Transient Impedance

Output Characteristics

Drain-Source On Resistance


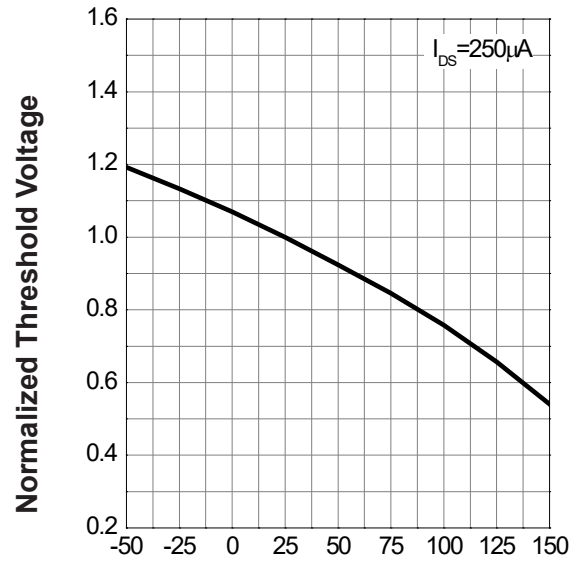
Channel 2 Typical Operating Characteristics(Cont.)

Gate-Source On Resistance



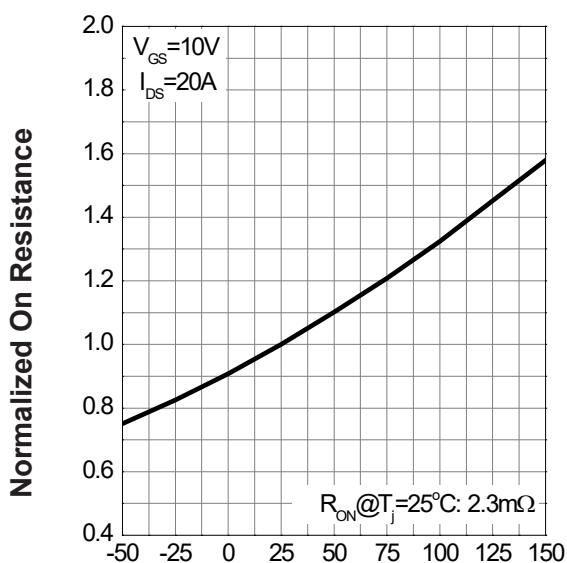
V_{GS} - Gate - Source Voltage (V)

Gate Threshold Voltage



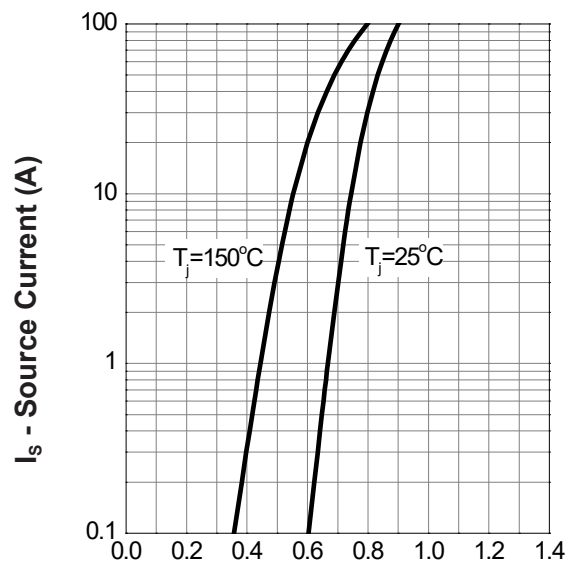
T_J - Junction Temperature ($^{\circ}C$)

Drain-Source On Resistance



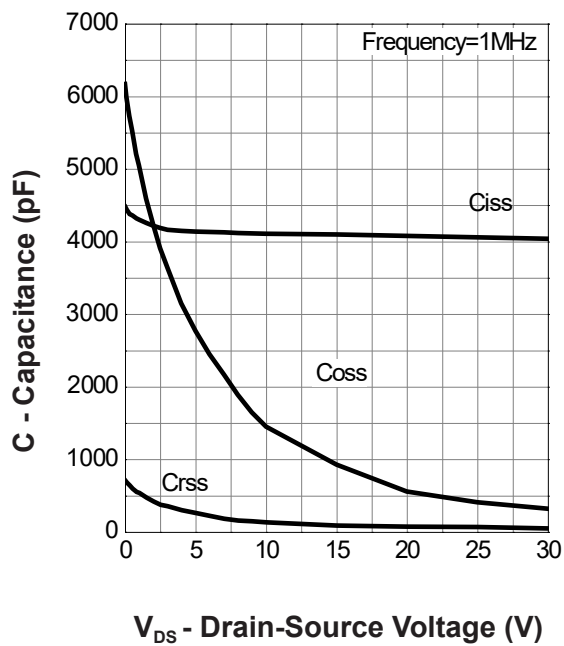
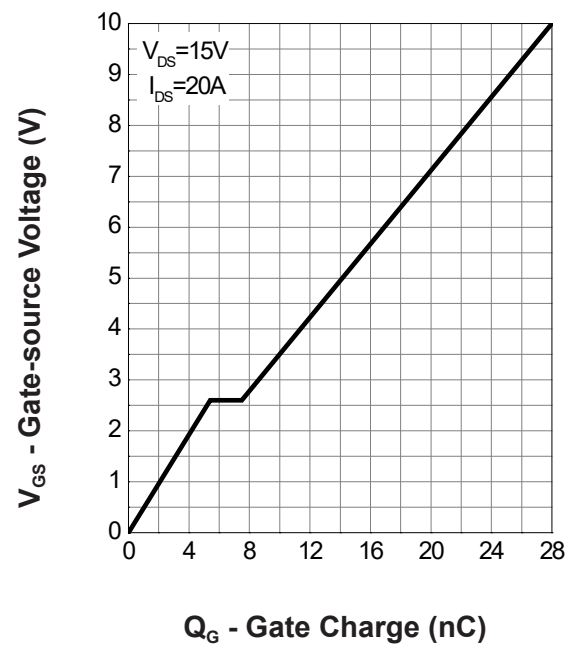
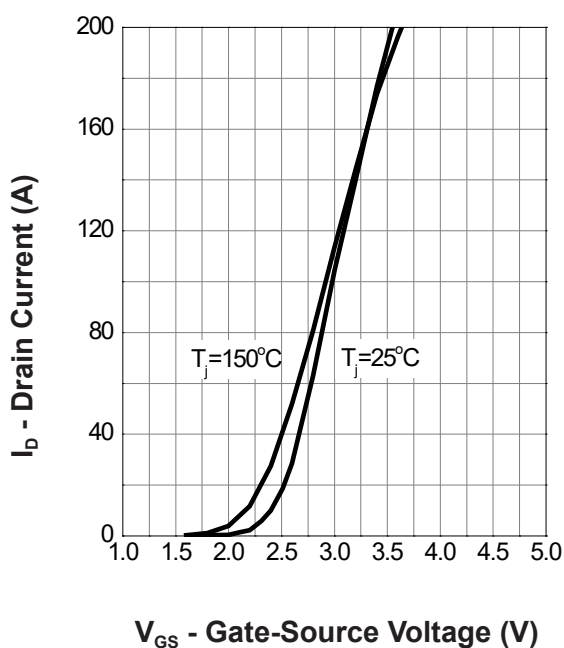
T_J - Junction Temperature ($^{\circ}C$)

Source-Drain Diode Forward

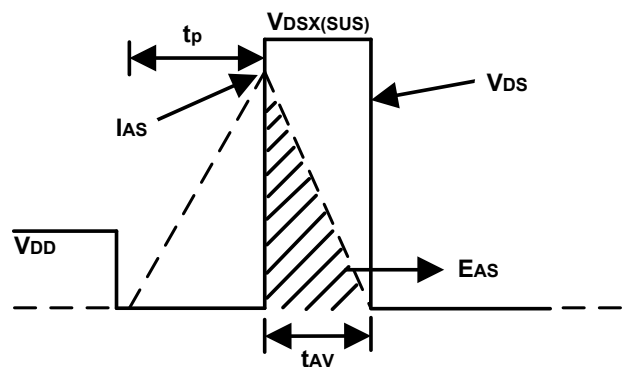
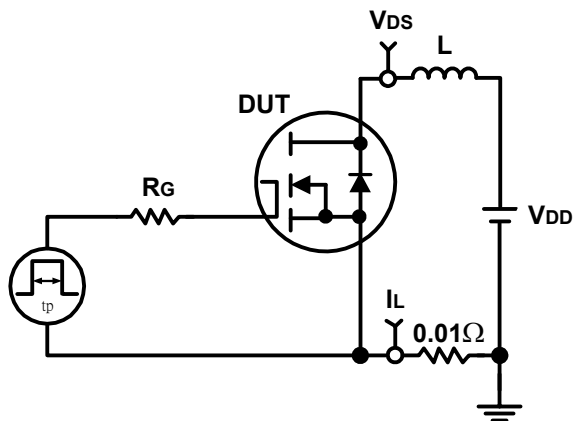


V_{SD} - Source - Drain Voltage (V)

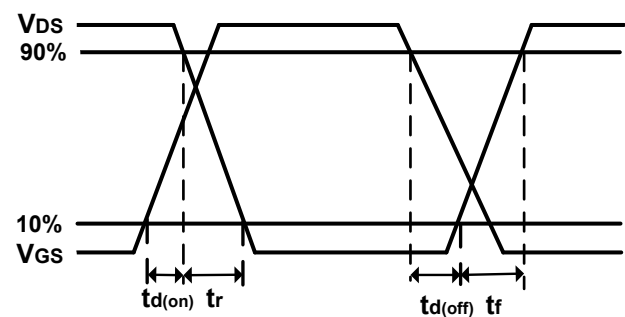
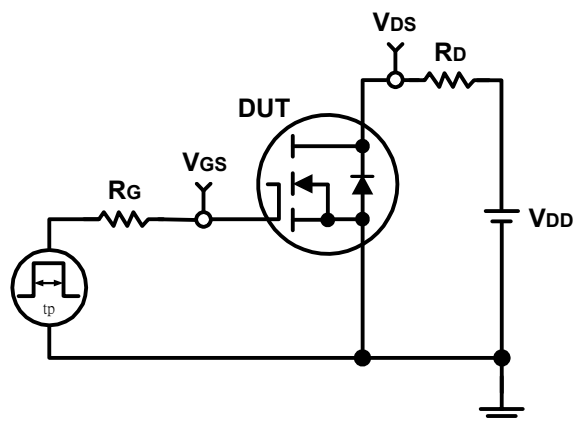
Channel 2 Typical Operating Characteristics(Cont.)

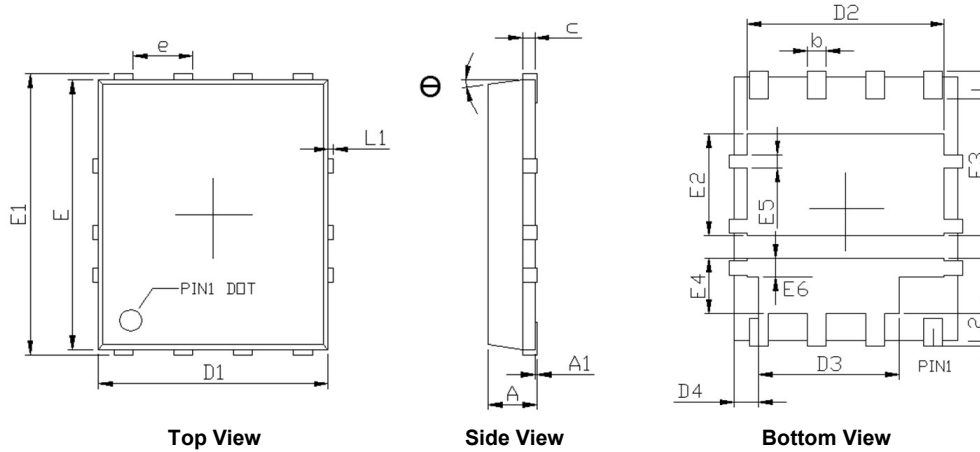
Capacitance

Gate Charge

Transfer Characteristics


Avalanche Test Circuit and Waveforms



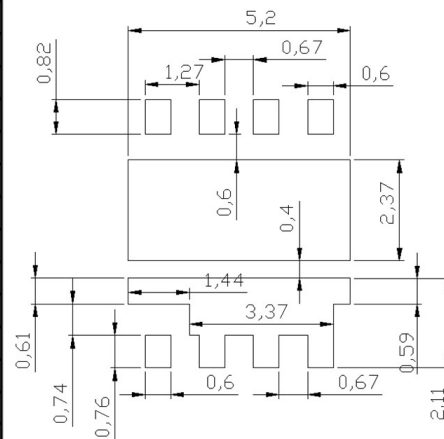
Switching Time Test Circuit and Waveforms





SYMBOLS	DFN5x6B-8_EP2_P			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.85	1.10	0.033	0.043
A1	0.00	0.05	0.000	0.002
b	0.33	0.51	0.013	0.020
c	0.15	0.30	0.006	0.012
D1	4.80	5.20	0.189	0.205
D2	3.61	4.70	0.142	0.185
D3	2.55	3.22	0.100	0.127
D4	0.445	0.645	0.0175	0.0254
E	5.55	5.80	0.219	0.228
E1	5.90	6.10	0.232	0.240
E2	2.02	2.50	0.080	0.098
E3	0.40	0.60	0.016	0.024
E4	1.10	1.42	0.043	0.056
E5	0.20	0.40	0.0079	0.0157
E6	0.31	0.51	0.0122	0.0201
e	1.27 BSC		0.050 BSC	
L	0.35	0.71	0.014	0.028
L1	0.00	0.10	0.000	0.004
L2	0.48	0.81	0.019	0.032
θ	0°	12°	0°	12°

RECOMMENDED LAND PATTERN



UNIT: mm