

Product Summary

VSSS	VGSS	RDS(ON) TYP/MAX	ID MAX
30V	± 20V	7.8/10.2 mΩ@VGS=10V 9.5/12.4 mΩ@VGS=4.5V	38.0A
-30V		26.8/34.8 mΩ@VGS=10V 34.8/46.8 mΩ@VGS=4.5V	-20.5A

Features

- Battery Switch, Load Switch
- Ultra low RDS(ON) by advanced trench technology
- Halogen-Free / RoHS Compliant
- 4.5V Drive Low Drain-Source On-State Resistance

- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation
- High ESD capability

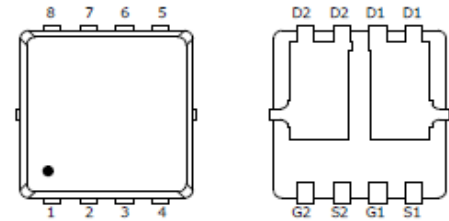
Form

Tape & Reel Embossed Type: 5,000pcs / reel

Absolute maximum rating@25°C

Parameter	Symbol	Rating	Unit
N-channel MOSFET			
Drain to Source Voltage	VDS	30	V
Gate to Source Voltage	VGS	±20	V
Drain Current	DC	ID *1	A
	Pulse	IDP *2	A
Single Pulsed Avatanche Energy	EAS	80	mJ
P-channel MOSFET			
Drain to Source Voltage	VDS	-30	V
Gate to Source Voltage	VGS	±20	V
Drain Current	DC	ID *1	A
	Pulse	IDP *2	A
Single Pulsed Avatanche Energy	EAS *3	45	mJ

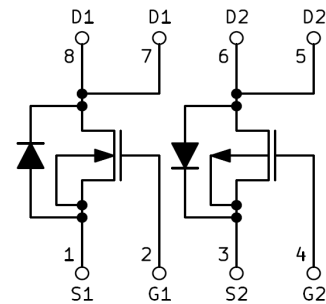
Pin Assignment



N-channel: 1: Source1, 2: Gate1, 7,8 :Drain1

P-channel: 3: Source2, 4 :Gate2, 5,6 :Drain2

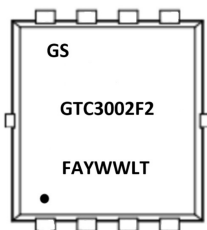
Equivalent Circuit



Thermal Characteristic

Parameter		Symbol	Rating	Unit
Thermal Resistance from Junction to Ambient	N-Ch	Rthja ^{*4}	76.6	°C/W
	P-Ch	Rthja ^{*4}	80.5	°C/W
Thermal Resistance from Junction to Case	N-Ch	Rthjc ^{*1}	4.1	°C/W
	P-Ch	Rthjc ^{*1}	5.0	°C/W
Power Dissipation	N-Ch	PD(Nch)	30	W
	P-Ch	PD(Pch)	25	W
Junction Temperature		Tj	150	°C
Storage Temperature		Tstg	-55 to +150	°C

Marking Symbol Code



NOTE:
 LOGO - GS
 GTC3002F2 - Part number code
 F - Fab location code
 A - Assembly location code
 Y - Year code
 WW - Week code
 L&T - Assembly lot code
 ●: Pin#1 Identifier

**N-Channel MOSFET Electrical Characteristics (T_J=25°C unless otherwise noted)**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VDSS	ID=250uA, VGS=0V	30			V
Zero Gate Voltage Drain Current	IDSS	VDS=24V, VGS=0V (Tj=25°C)			1.0	μA
		VDS=24V, VGS=0V (Tj=125°C) *5			100	μA
Gate-Source Leakage Current	IGSS	VGS=±20V, VDS=0V			±100	nA
Gate-Source Threshold Voltage	Vth	VDS=10V, ID=250uA	1.0	1.8	2.5	V
Drain-Source On-State Resistance	RDS(on)1 RDS(on)2	ID=8A, VGS=10V ID=6A, VGS=4.5V		7.8 9.5	10.2 12.4	mΩ
Input Capacitance *5	Ciss	VDS=15V, VGS=0V, f=1MHz		1,381		pF
Output Capacitance *5	Coss			153		
Reverse Transfer Capacitance *5	Crss			117		
Gate Resistance *5	Rg	f=1MHz		5.8		Ω
Turn-On Delay Time *5	td(on)	VDD=15V, VGS=10V, IRL=5Ω		28		ns
Rise Time *5	tr			73		
Turn-Off Delay Time *5	td(off)			214		
Fall Time *5	tf			124		
Total Gate Charge *5	Qg	VGS=10V, VDS=15V, ID=8A		25.4		nC
Gate-Source Charge *5	Qgs			3.8		
Gate-Drain Charge *5	Qgd			5.1		
Drain-Source diode forward voltage	VSD	VGS=0V, ID=8A			1.2	V
Continuous Drain-Source diode forward current *1	IS				30	A
Pulsed Drain-Source diode forward current *2	ISP				100	A

Note *1 Tc=25°C Limited only by maximum temperature allowed.

Note *2 PW≤10μs, Duty≤ 1%

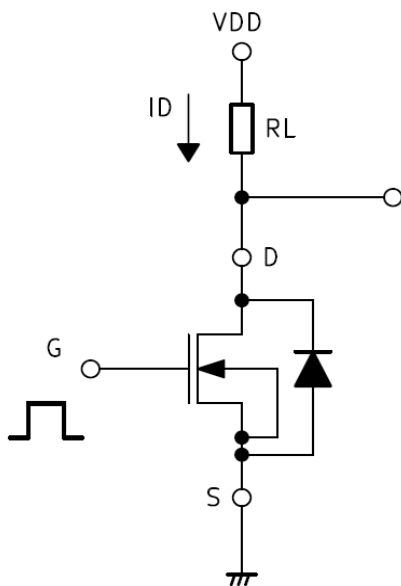
Note *3 Nch EAS condition: VDD=15V, VGS=10V, L=0.5mH, Rg=25Ω, Starting Tj=25°C

Note *3 Pch EAS condition: VDD=-15V, VGS=-10V, L=0.5mH, Rg=25Ω, Starting Tj=25°C

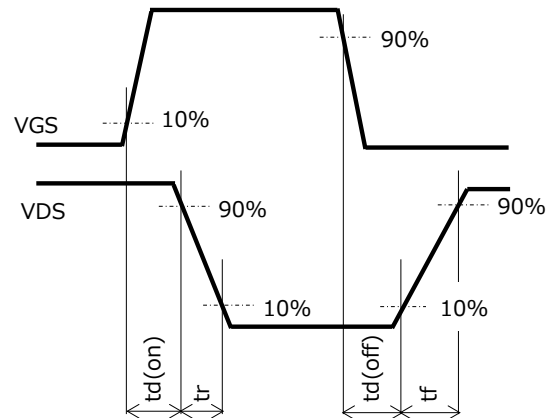
Note *4 Mounted on FR4 board (1inch square, 25.4mm x 25.4mm x t1.6mm)

with maximum copper pad (Cu thickness = 70μm)

Note *5 Guaranteed by Design



(Definition of Switching Measurement Detection)



**P-Channel MOSFET Electrical Characteristics (T_J=25°C unless otherwise noted)**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VDSS	ID=-250μA, VGS=0V	-30			V
Zero Gate Voltage Drain Current	IDSS	VDS=-24V, VGS=0V (T _J =25°C)			-1.0	μA
		VDS=-24V, VGS=0V (T _J =125°C) *5			-100	μA
Gate-Source Leakage Current	IGSS	VGS=±20V, VDS=0V			±100	nA
Gate-Source Threshold Voltage	Vth	VDS=-10V, ID=-250μA	-1.0	-1.5	-2.5	V
Drain-Source On-State Resistance	RDS(on)1	ID=-8A, VGS=-10V		26.8	34.8	mΩ
	RDS(on)2	ID=-6A, VGS=-4.5V		34.8	46.8	mΩ
Input Capacitance *5	Ciss	VDS=-15V, VGS=0V, f=1MHz		1,259		pF
Output Capacitance *5	Coss			712		pF
Reverse Transfer Capacitance *5	Crss			439		pF
Gate Resistance *5	Rg	f=1MHz		14.2		Ω
Turn-On Delay Time *5	td(on)	VDD=-15V, VGS=-10V, IRL=5Ω		17		ns
Rise Time *5	tr			79		ns
Turn-Off Delay Time *5	td(off)			175		ns
Fall Time *5	tf			133		ns
Total Gate Charge *5	Qg	VGS=-10V, VDS=-15V, ID=-8A		15.7		nC
Gate-Source Charge *5	Qgs			2.5		nC
Gate-Drain Charge *5	Qgd			2.8		nC
Drain-Source diode forward voltage	VSD	VGS=0V, ID=-5A			-1.2	V
Continuous Drain-Source diode forward current *1	IS				-20	A
Pulsed Drain-Source diode forward current *2	ISP				-80	A

Note *1 T_c=25°C Limited only by maximum temperature allowed.

Note *2 PW≤10μs, Duty≤ 1%

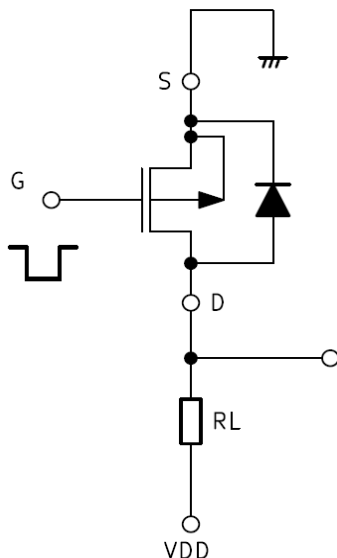
Note *3 Nch EAS condition: VDD=15V, VGS=10V, L=0.5mH, Rg=25Ω, Starting T_J=25°C

Note *3 Pch EAS condition: VDD=-15V, VGS=-10V, L=0.5mH, Rg=25Ω, Starting T_J=25°C

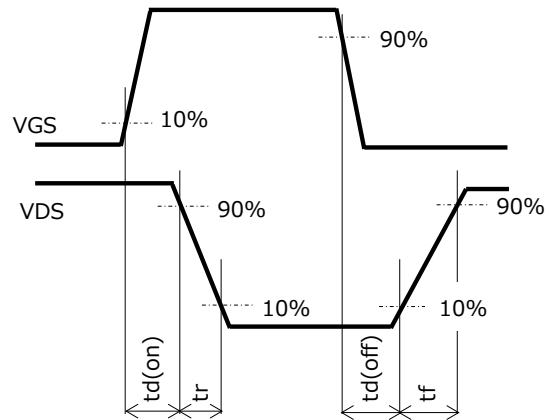
Note *4 Mounted on FR4 board (1inch square, 25.4mm x 25.4mm x t1.6mm)

with maximum copper pad (Cu thickness = 70μm)

Note *5 Guaranteed by Design



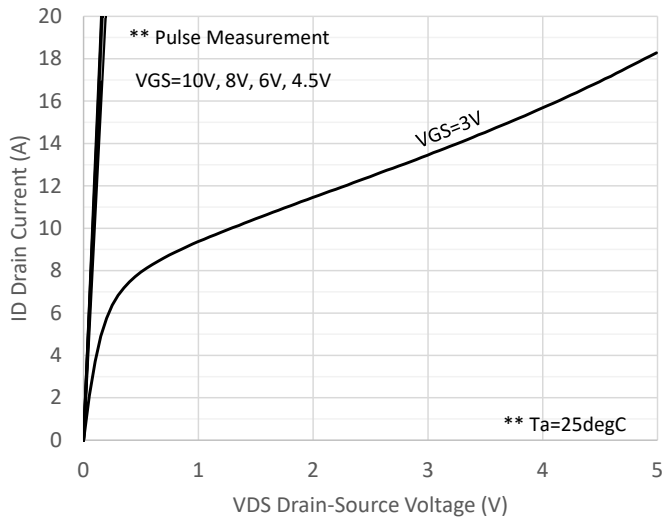
(Definition of Switching Measurement Detection)



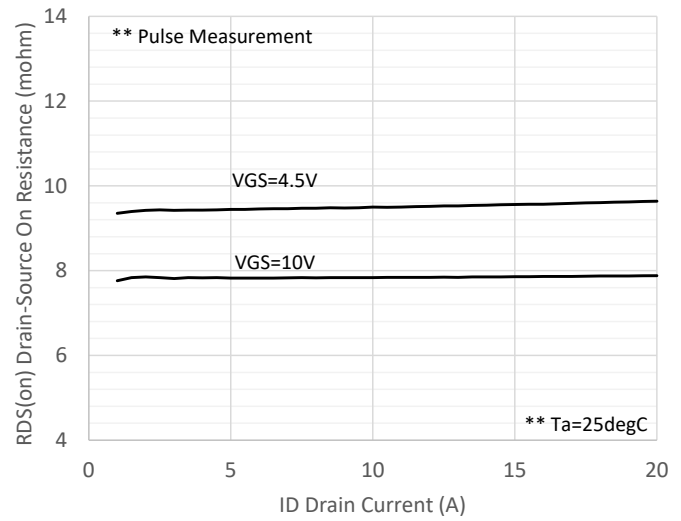


Typical Performance Characteristics: Nch

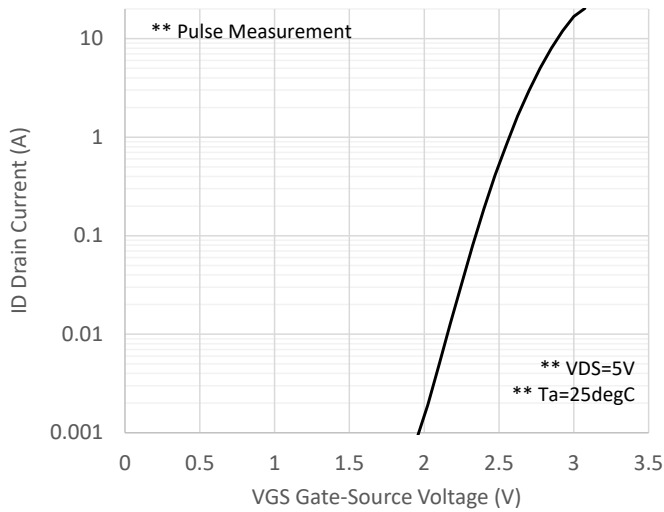
ID to VDS



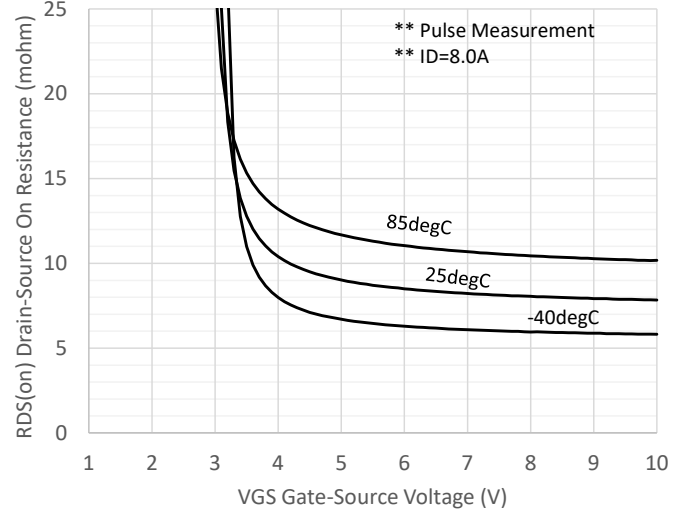
RDS(on) to ID



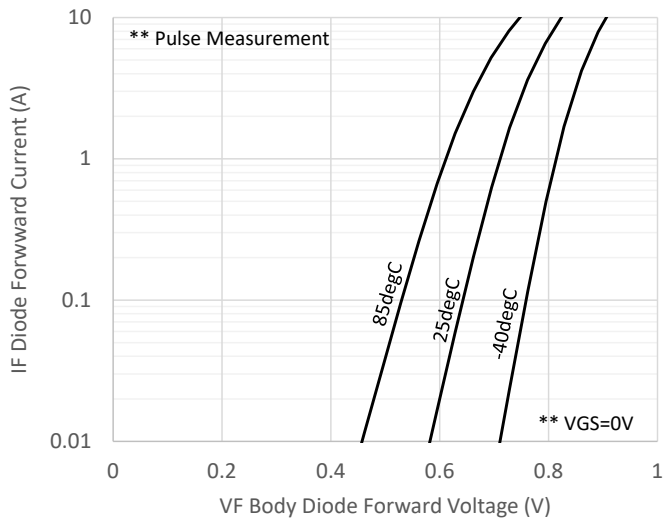
ID to VGS



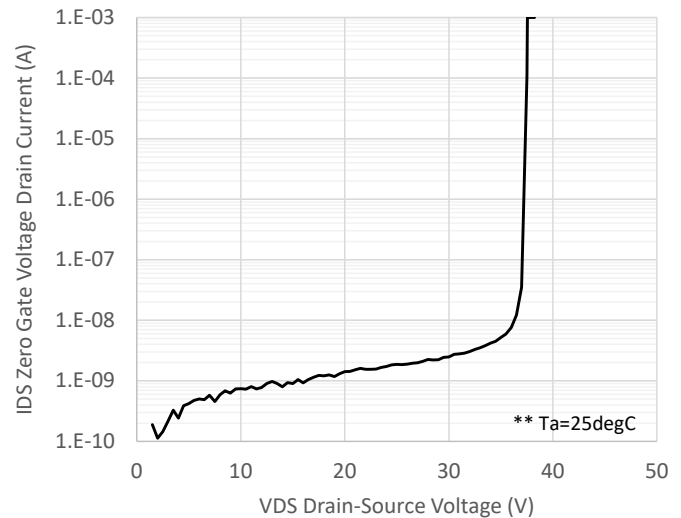
RDS(on) to VGS



IF to VF



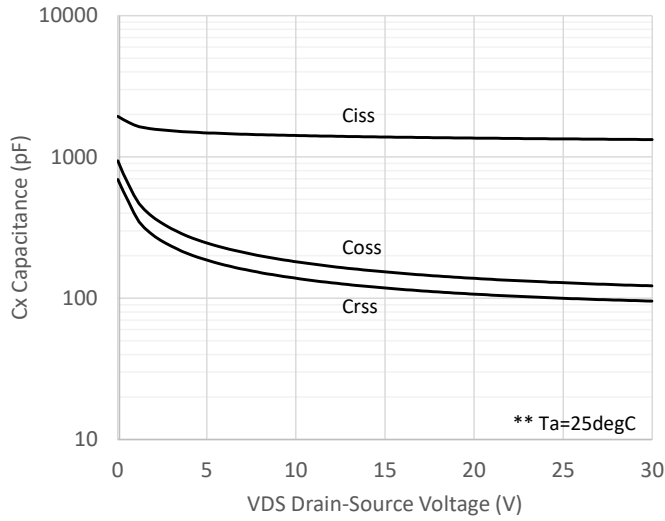
IDS to VDS



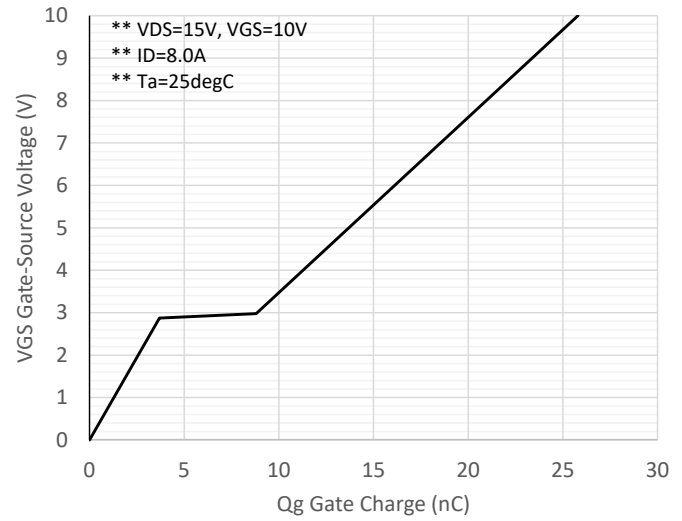


Typical Performance Characteristics: Nch

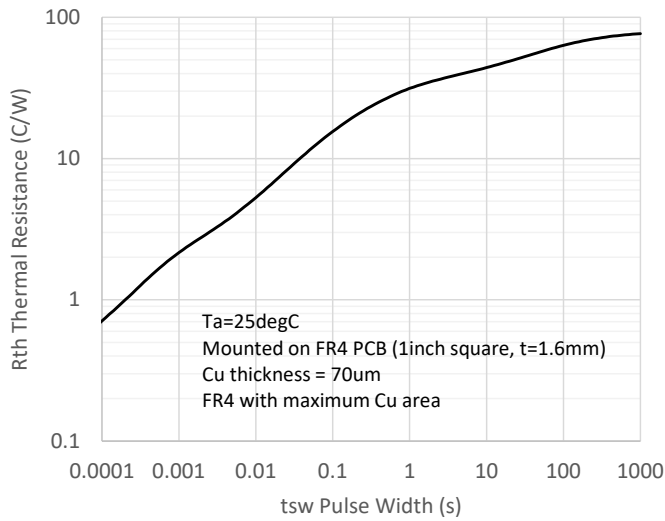
Capacitance



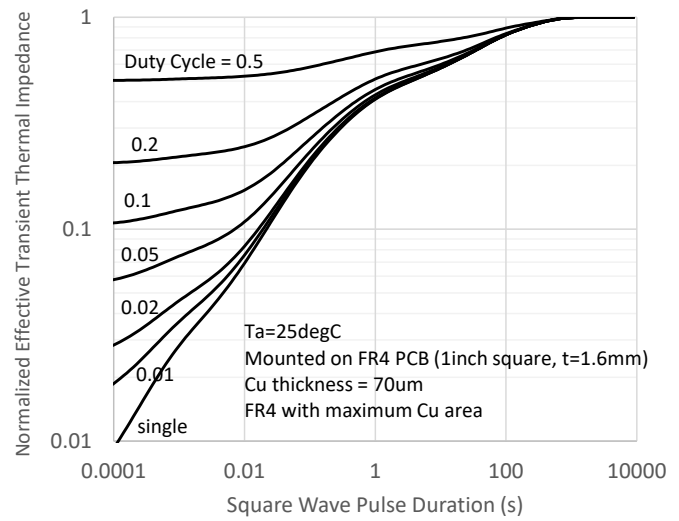
Dynamic Input / Output Characteristics



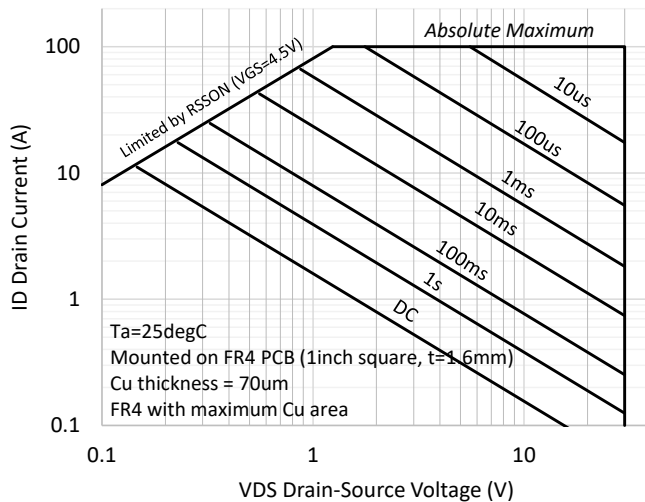
Rth to tsw



Thermal Response

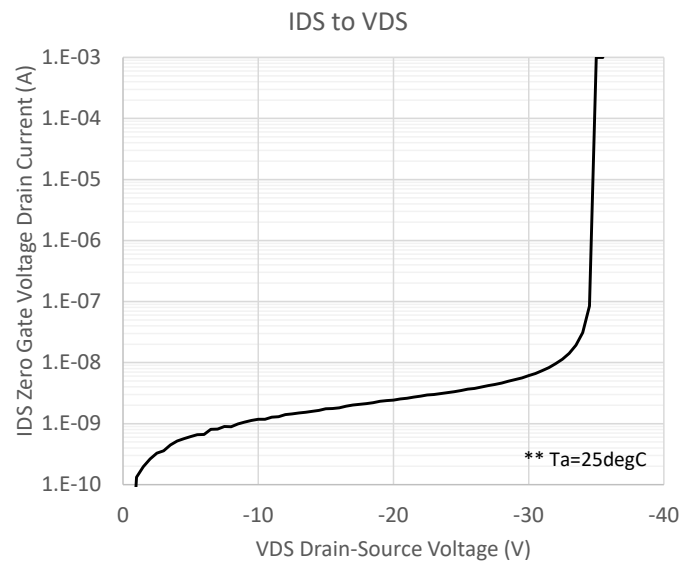
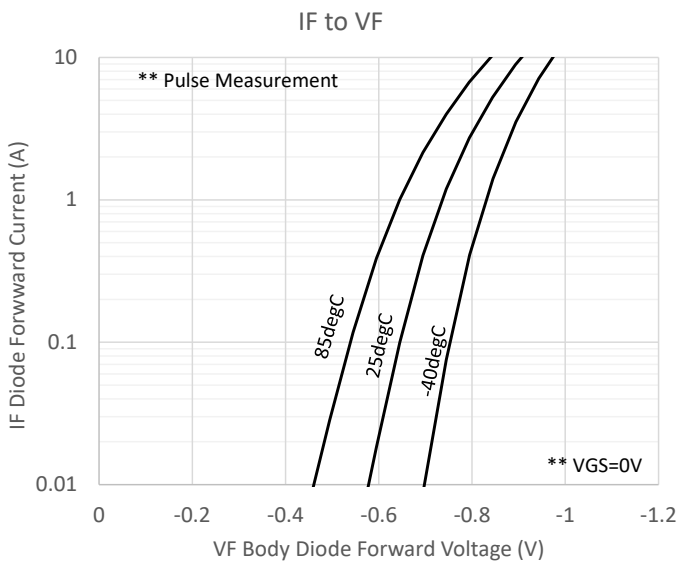
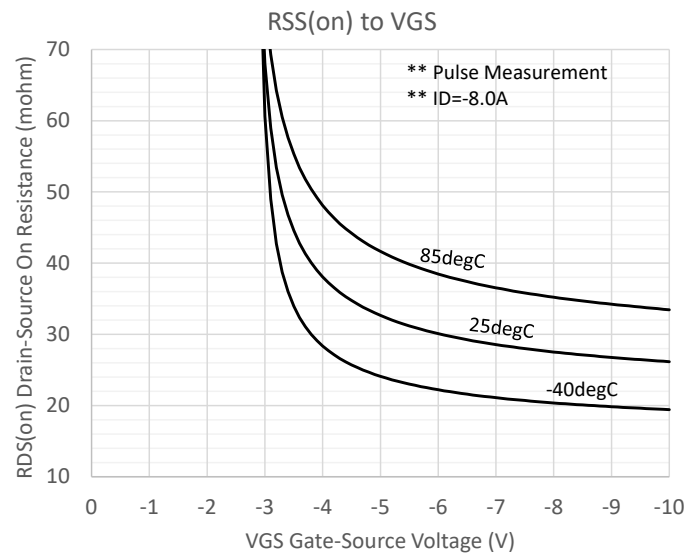
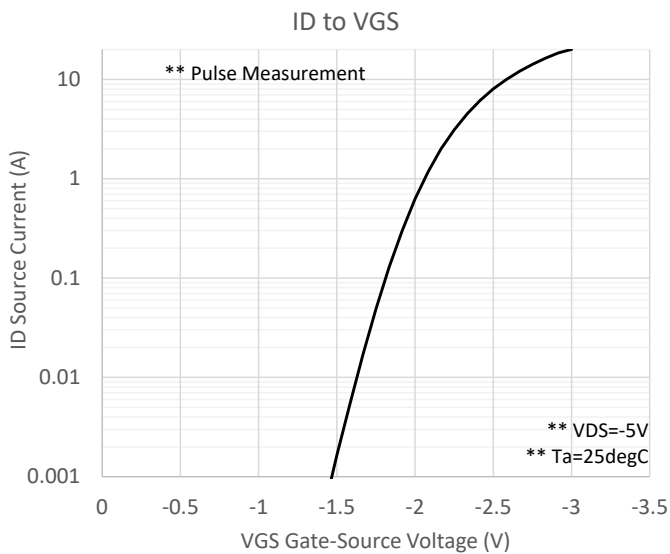
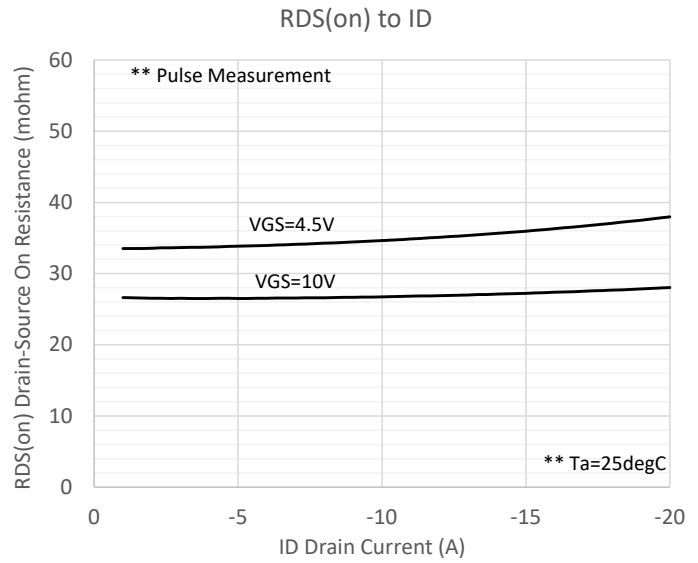
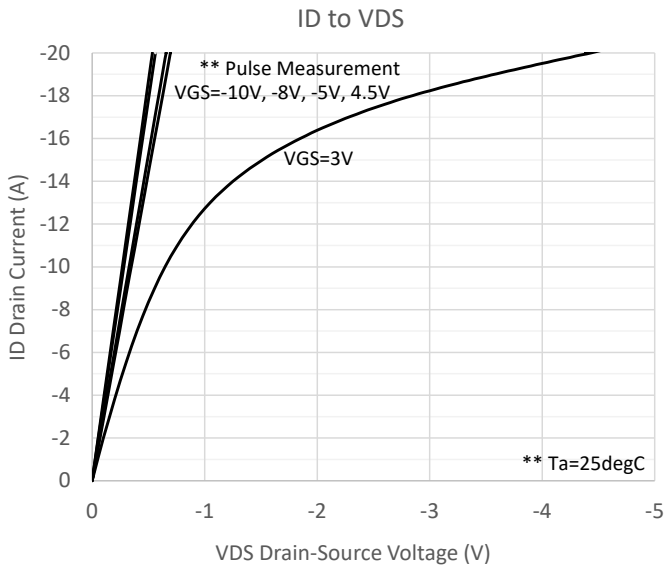


Safe Operating Area





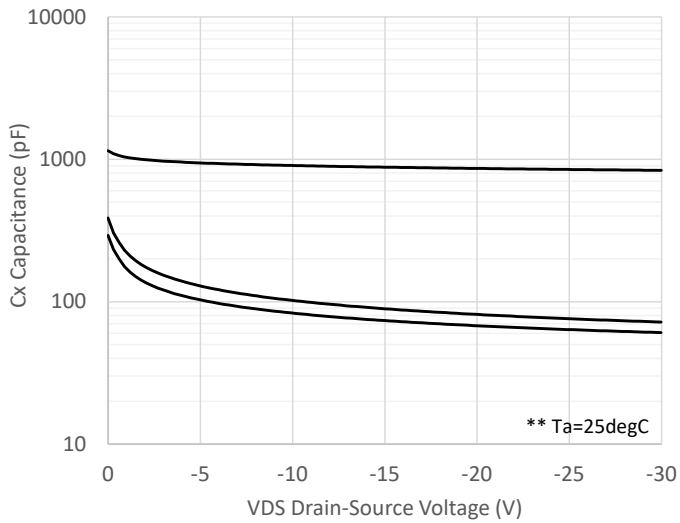
Typical Performance Characteristics: Pch



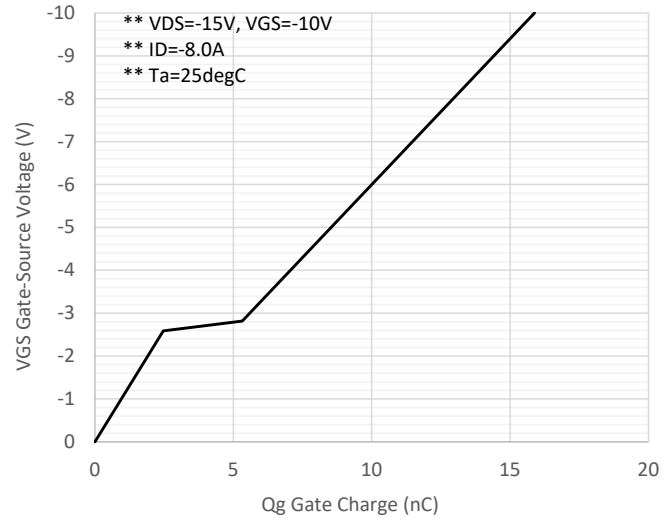


Typical Performance Characteristics: Pch

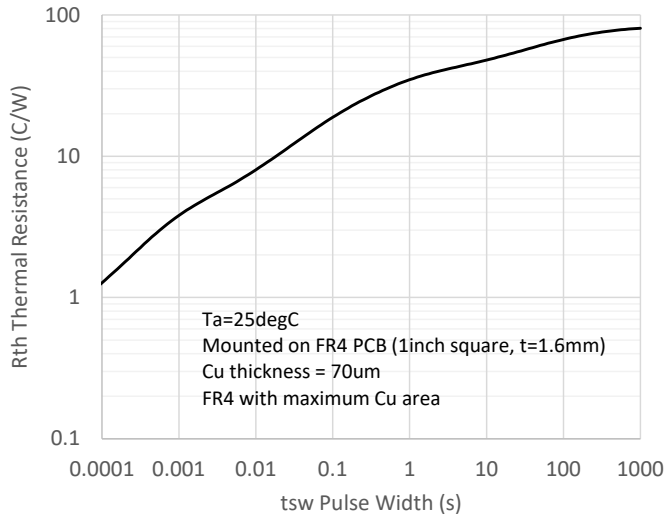
Capacitance



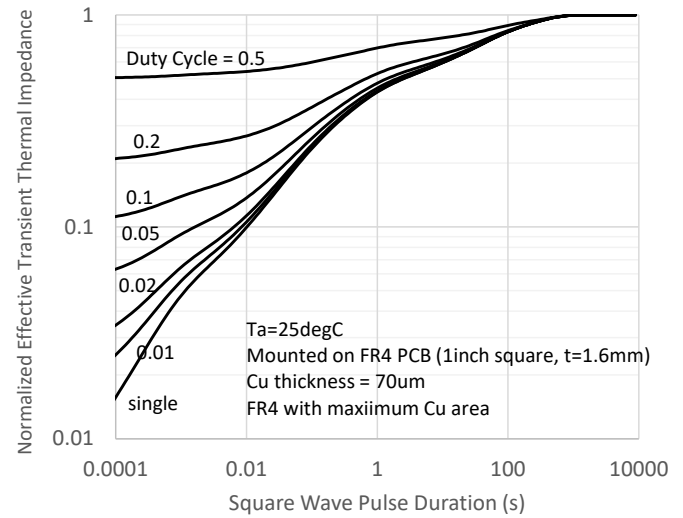
Dynamic Input / Output Characteristics



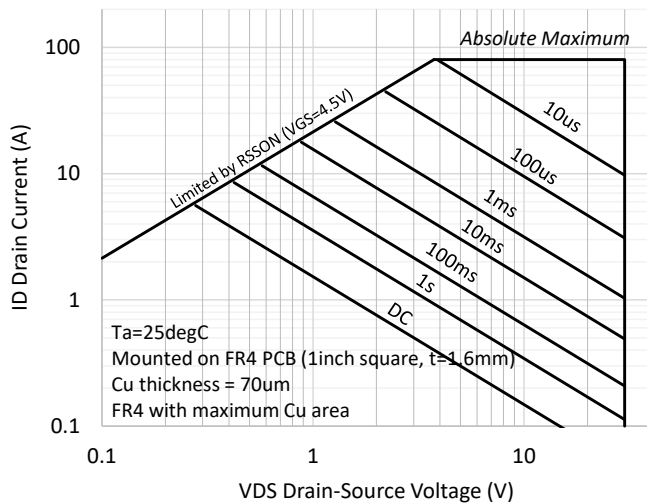
Rth to tsw



Thermal Response



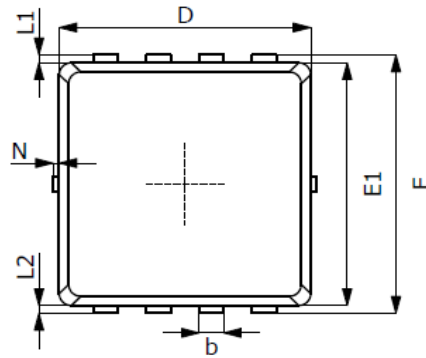
Safe Operating Area



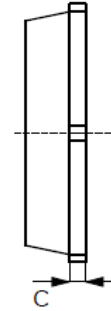


Outline Drawing:

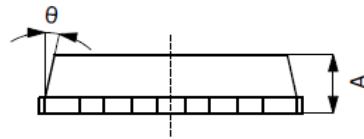
Top View



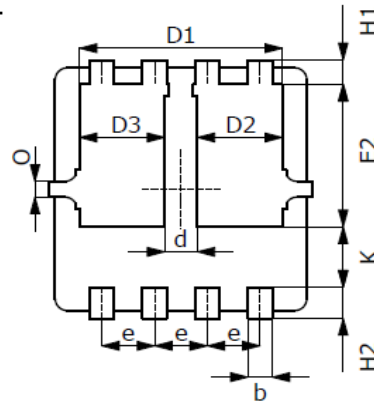
Side View 1



Side View 2



Bottom View



Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.650	0.750	0.850
b	0.250	0.300	0.350
C	0.150	0.200	0.250
D	3.000	3.100	3.200
D1	2.400	2.500	2.600
D2/D3	1.000	1.050	1.100
d	0.300	0.400	0.500
E	3.200	3.300	3.400
E1	3.000	3.100	3.200
E2	1.720	1.820	1.920
e	0.65 BSC		
H1	0.210	0.310	0.410
H2	0.300	0.400	0.500
K	0.670	0.770	0.870
L1/L2	0.10 REF		
θ	11°	12°	13°
N	0.000	---	0.150
O	0.2 REF		

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