

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	16mΩ@10V	6A
	24mΩ@4.5V	
-30V	40mΩ@-10V	-5A
	60mΩ@-4.5V	

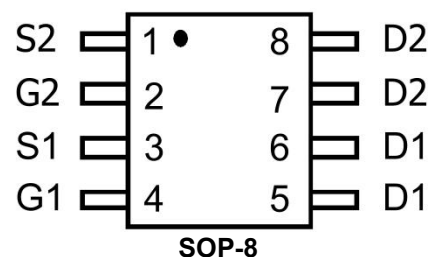
Feature

- TrenchFET Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge

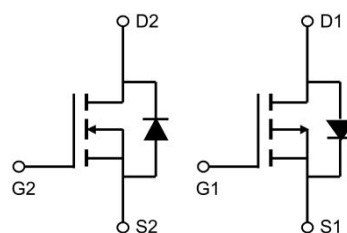
Application

- Load Switch for Portable Devices
- Battery Switch

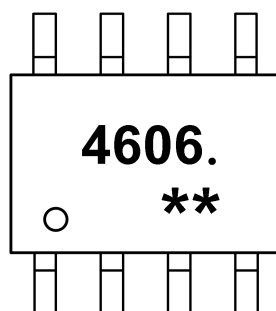
Package



Circuit diagram



Marking



4606. = Device code

** = Week Code

Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	30	-30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current($t \leq 10s$)	I_D	6	-5	A
Power Dissipation($t \leq 10s$)	P_D	2	2	W
Thermal Resistance from Junction to Ambient($t \leq 10s$)	$R_{\theta JA}$	62.5		°C/W
Junction Temperature	T_J	150		°C
Storage Temperature	T_{STG}	-55~ +150		°C

N-Channel Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	VGS = 0V, ID = 250μA	30			V
Zero gate voltage drain current	IDSS	VDS = 30V,VGS = 0V			1	μA
Gate-body leakage current	IGSS	VGS =±20V, VDS = 0V			±0.1	μA
Gate threshold voltage	VGS(th)	VDS =VGS, ID = 250μA	1.0	1.5	2.2	V
Drain-source on-resistance ¹⁾	RDS(on)	VGS = 10V, ID = 1A		16	20	mΩ
		VGS = 4.5V, ID = 1A		24	32	
Dynamic characteristics ²⁾						
Input Capacitance	Ciss	VDS=15V , VGS=0V , f=1MHz		513		pF
Output Capacitance	Coss			69		
Reverse Transfer Capacitance	Crss			51		
Switching Characteristics						
Total gate charge@4.5V	Qg	VDS=20V , VGS=4.5V , ID=6A		5		nC
Gate-source charge	Qgs			1.11		
Gate-drain charge	Qgd			2.61		
Turn-on delay time	td(on)	VDD=12V , VGS=10V , RG=3.3 ID=6A		7.7		ns
Turn-on rise time	tr			46		
Turn-off delay time	td(off)			11		
Turn-off fall time	tf			3.6		
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=1A , TJ=25℃			1.2	V

Notes:

- 1) Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 2) Guaranteed by design, not subject to production testing.

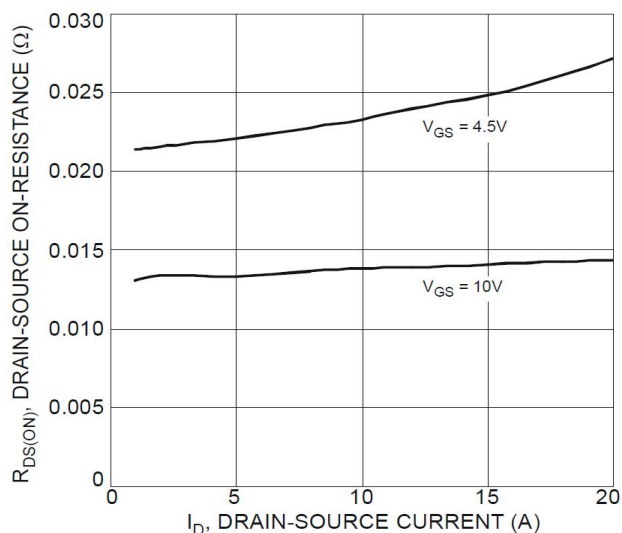
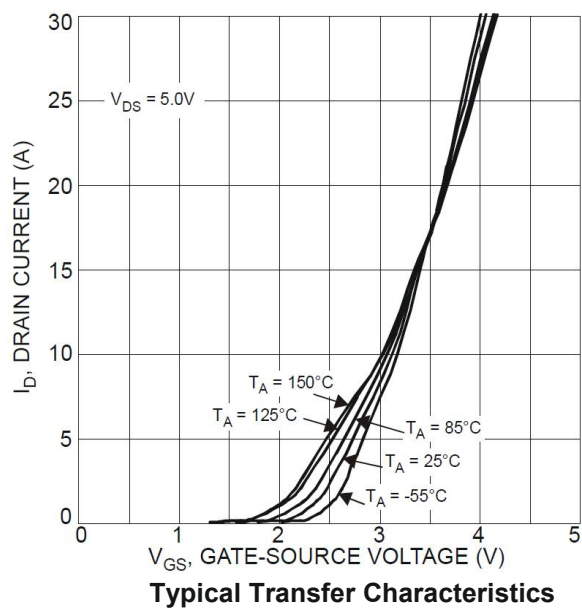
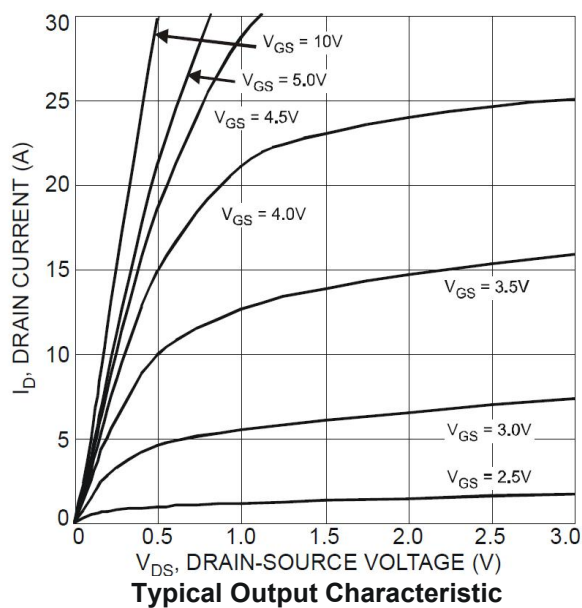
**P-Channel Electrical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)**

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =-250μA	-30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-24V,V _{GS} = 0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage ¹⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.6	-3	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} =-10V, I _D =-4.1A		40	50	mΩ
		V _{GS} =-4.5V, I _D =-3A		60	80	
Forward transconductance ¹⁾	g _{FS}	V _{DS} =-5V, I _D =-4A	5.5			S
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =-15V,V _{GS} =0V,f =1MHz		501		pF
Output Capacitance	C _{oss}			72		
Reverse Transfer Capacitance	C _{rss}			57		
Turn-on delay time	t _{d(on)}	V _{DS} =-15V,V _{GS} =-10V, R _L =3.6Ω,R _{GEN} =3Ω		8.6		ns
Turn-on rise time	t _r			5.0		
Turn-off delay time	t _{d(off)}			28.2		
Turn-off fall time	t _f			13.5		
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =-1A			-1.2	V

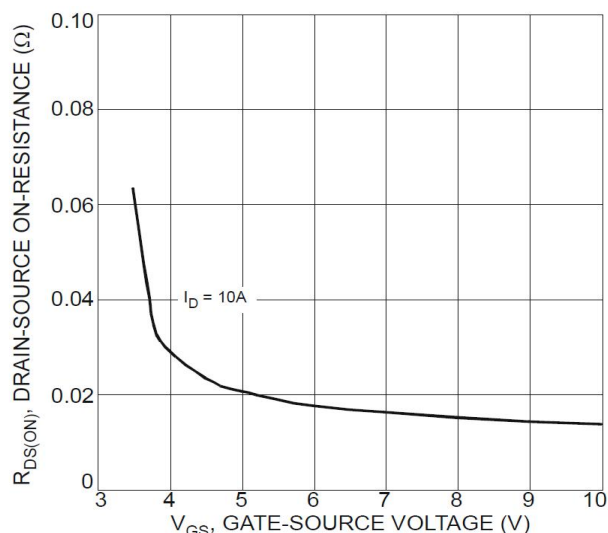
Notes:

- 1) Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 2) These parameters have no way to verif.

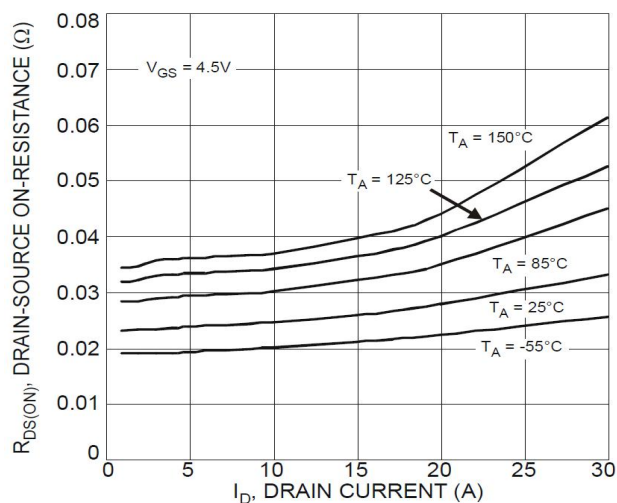
N-Channel Typical Characteristics



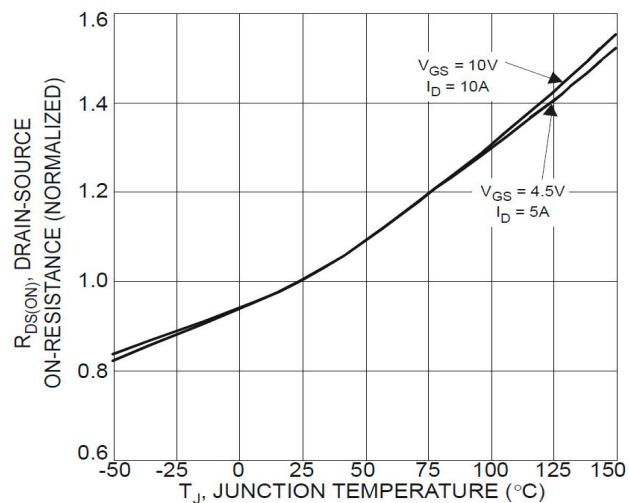
On-Resistance vs. Drain Current and Gate Voltage



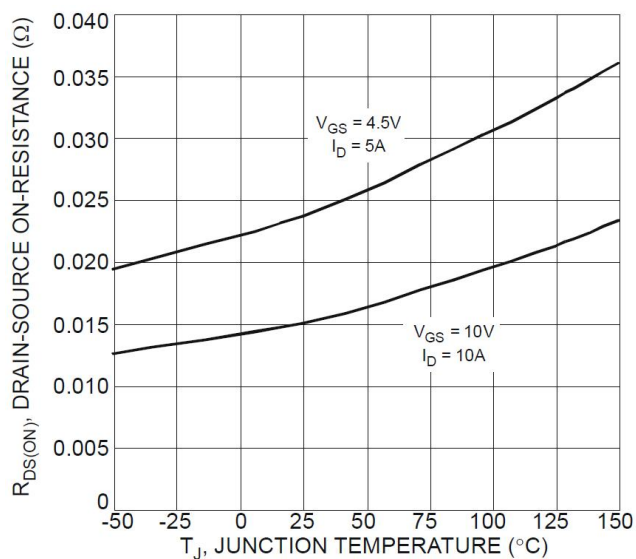
On-Resistance vs. Drain Current and Gate Voltage



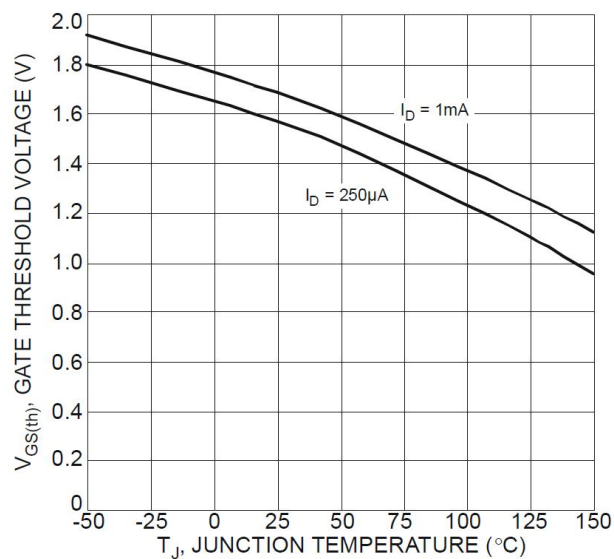
On-Resistance vs. Drain Current and Temperature



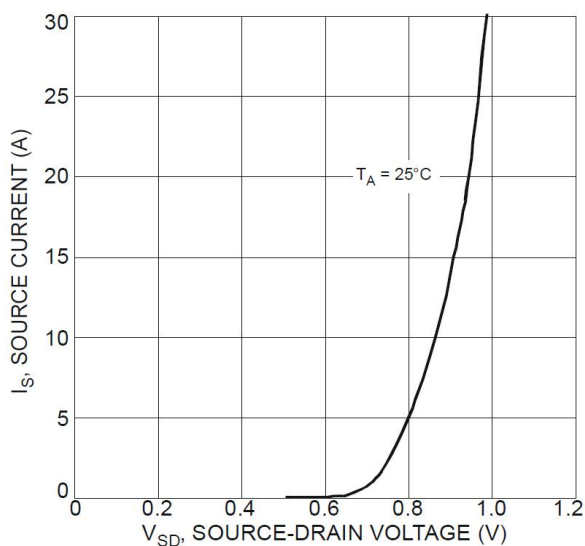
On-Resistance Variation with Temperature



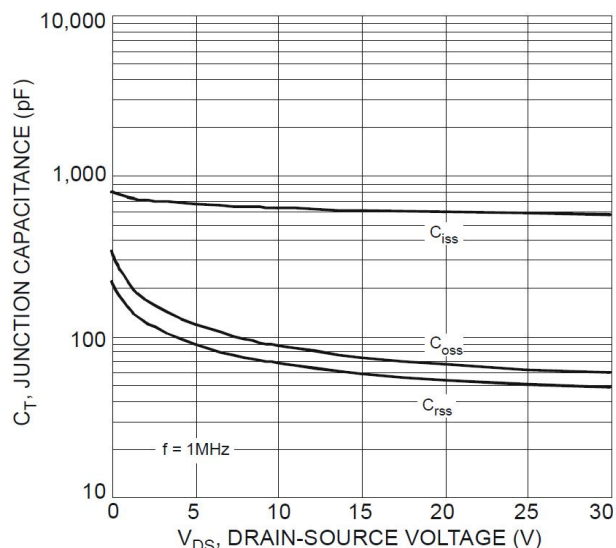
On-Resistance Variation with Temperature



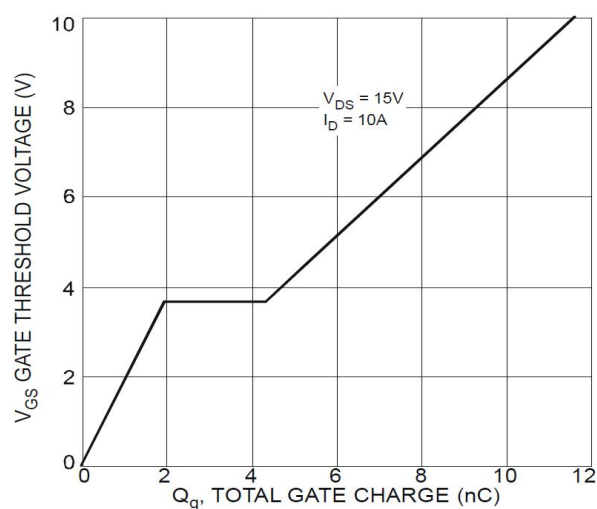
Gate Threshold Variation vs. Ambient Temperature



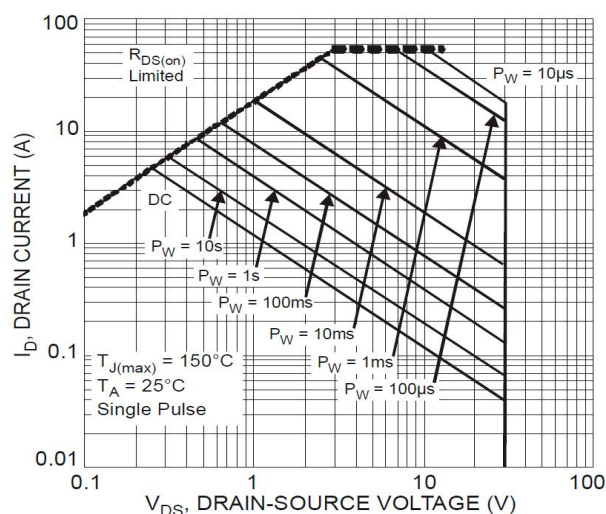
Diode Forward Voltage vs. Current



Typical Junction Capacitance



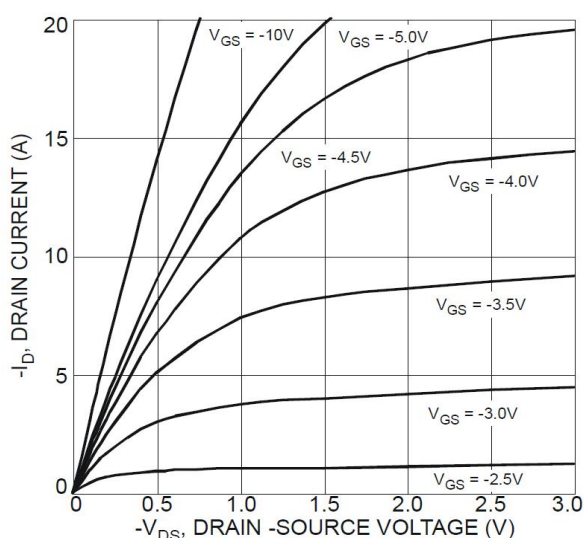
Gate Charge



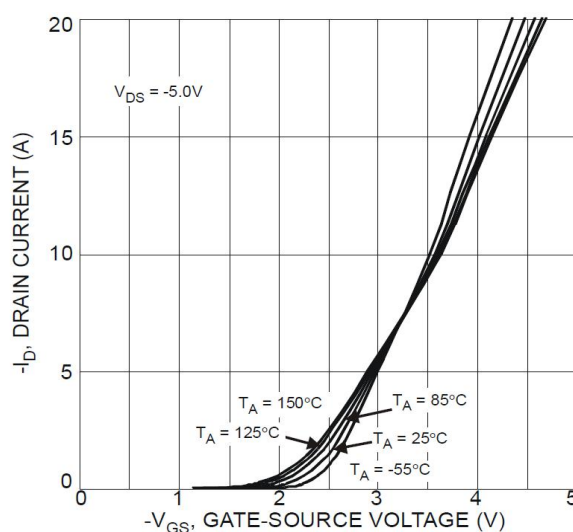
SOA, Safe Operation Area



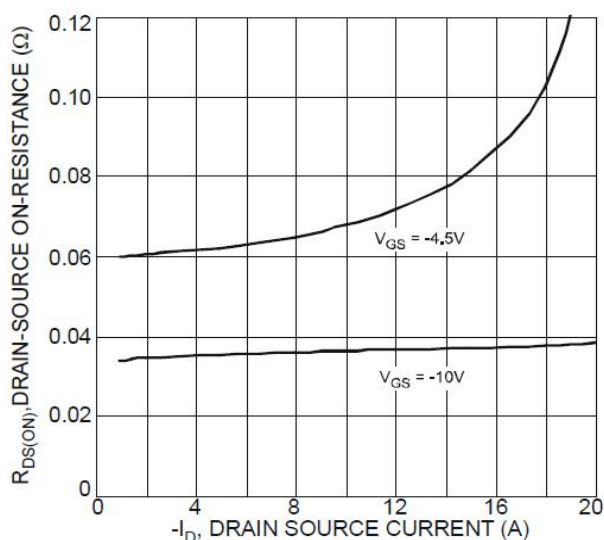
P-Channel Typical Characteristics



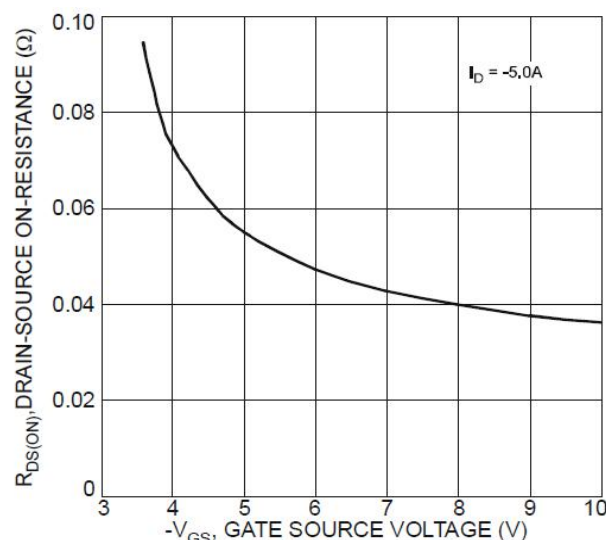
Typical Output Characteristics



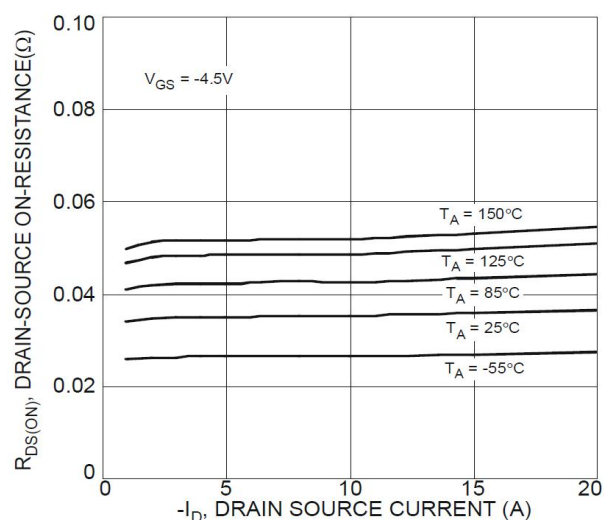
Typical Transfer Characteristics



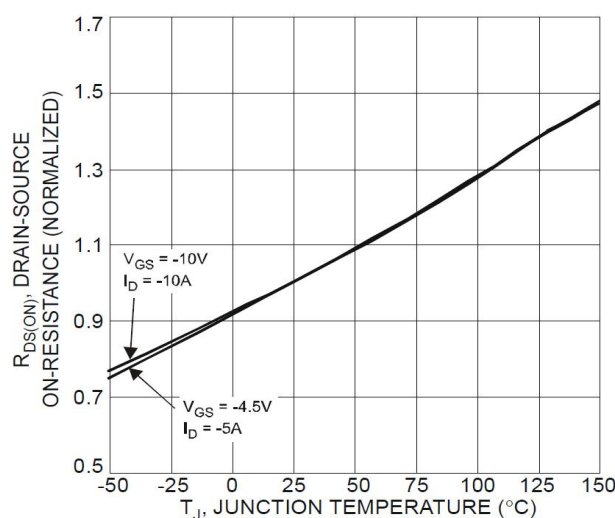
On-Resistance vs. Drain Current and Gate Voltage



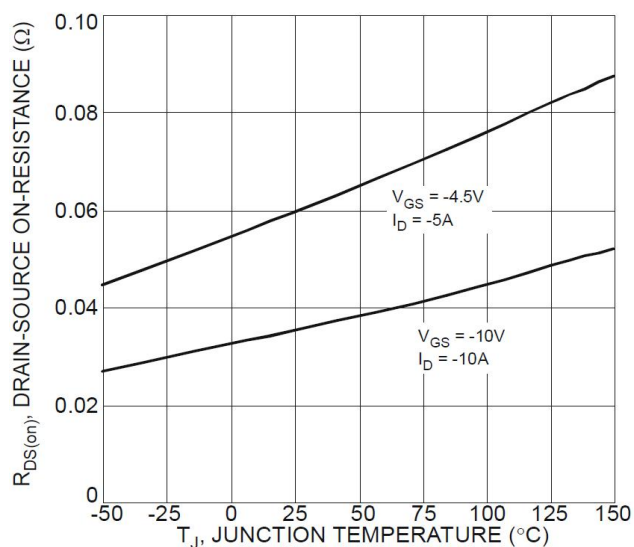
On-Resistance vs. Drain Current and Gate Voltage



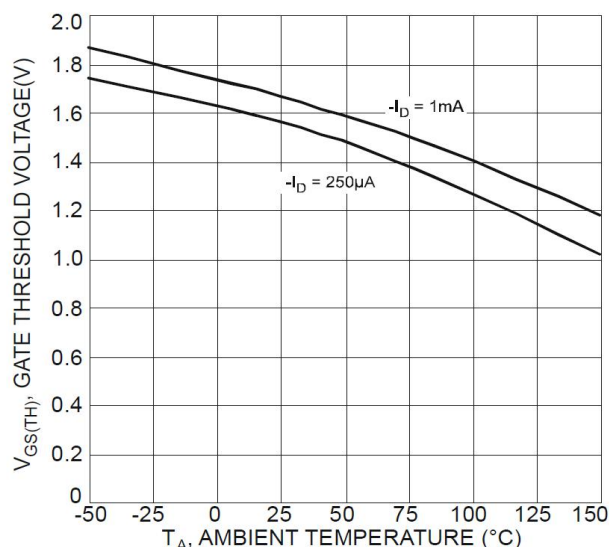
On-Resistance vs. Drain Current and Temperature



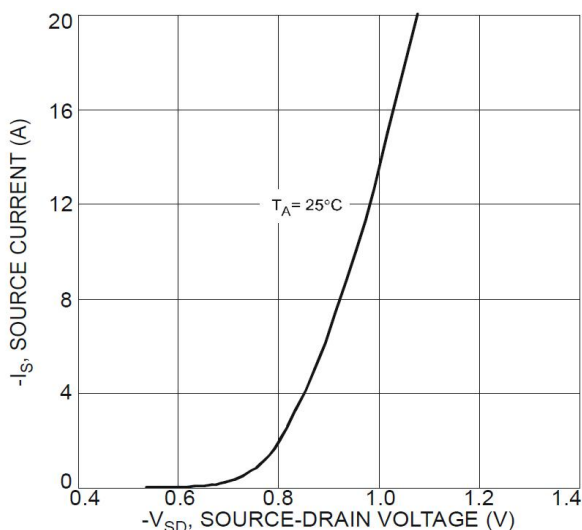
On-Resistance Variation with Temperature



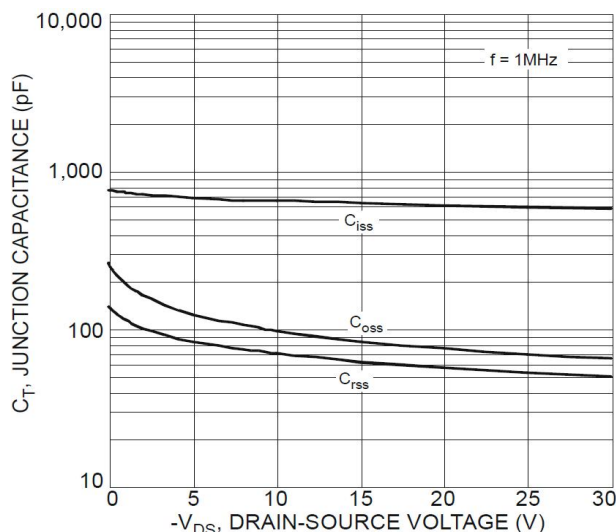
On-Resistance Variation with Temperature



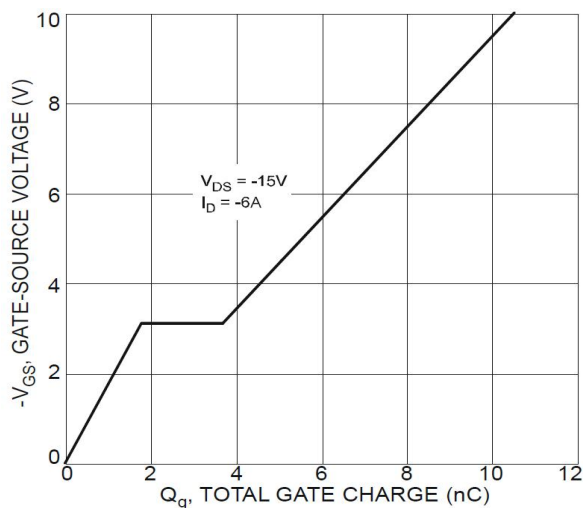
Gate Threshold Variation vs. Ambient Temperature



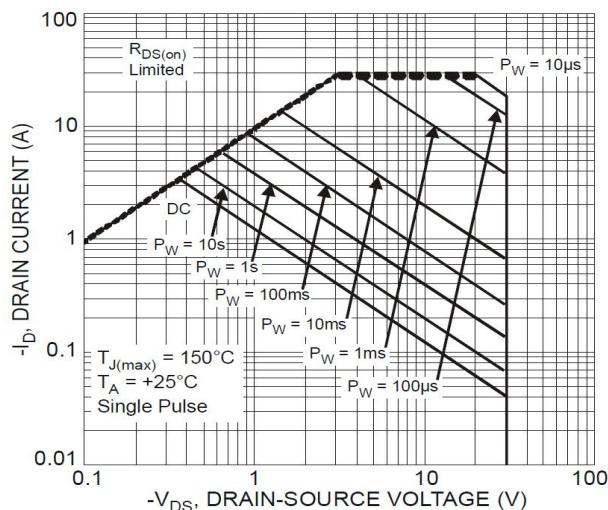
Diode Forward Voltage vs. Current



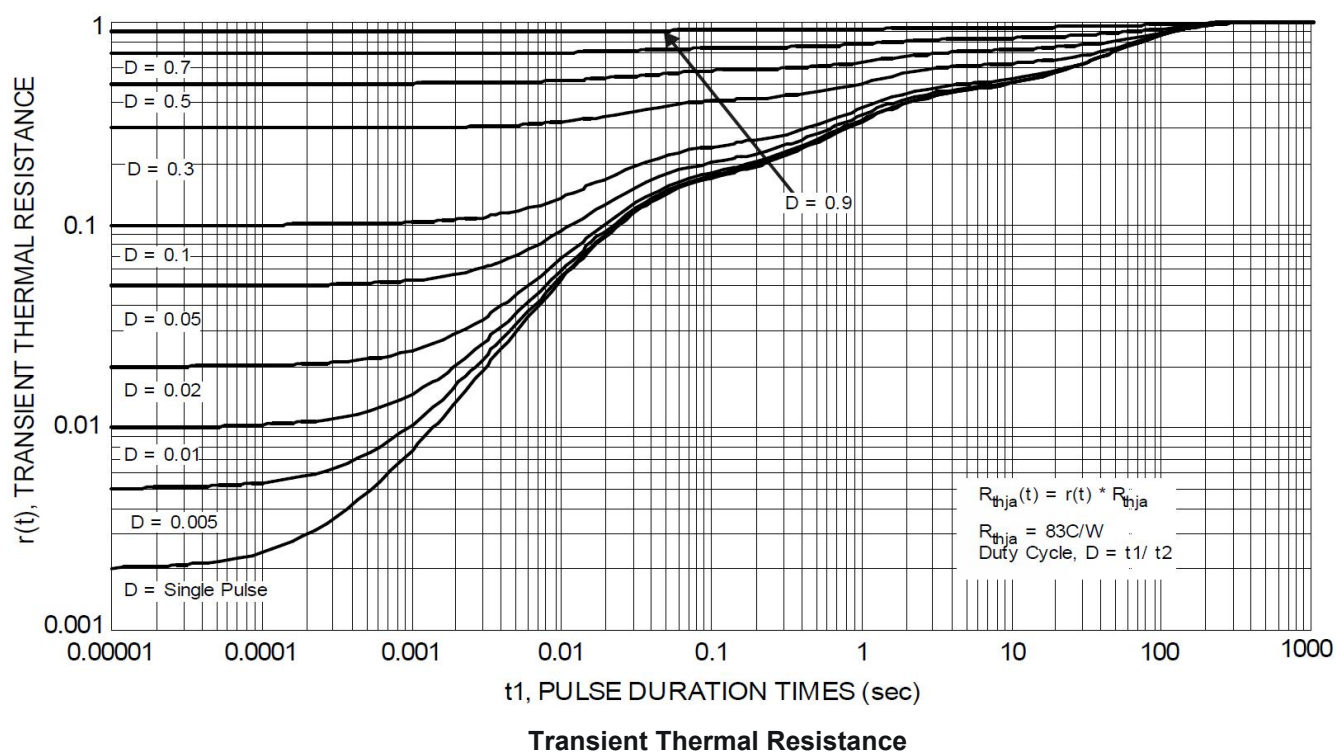
Typical Junction Capacitance



Gate-Charge Characteristics

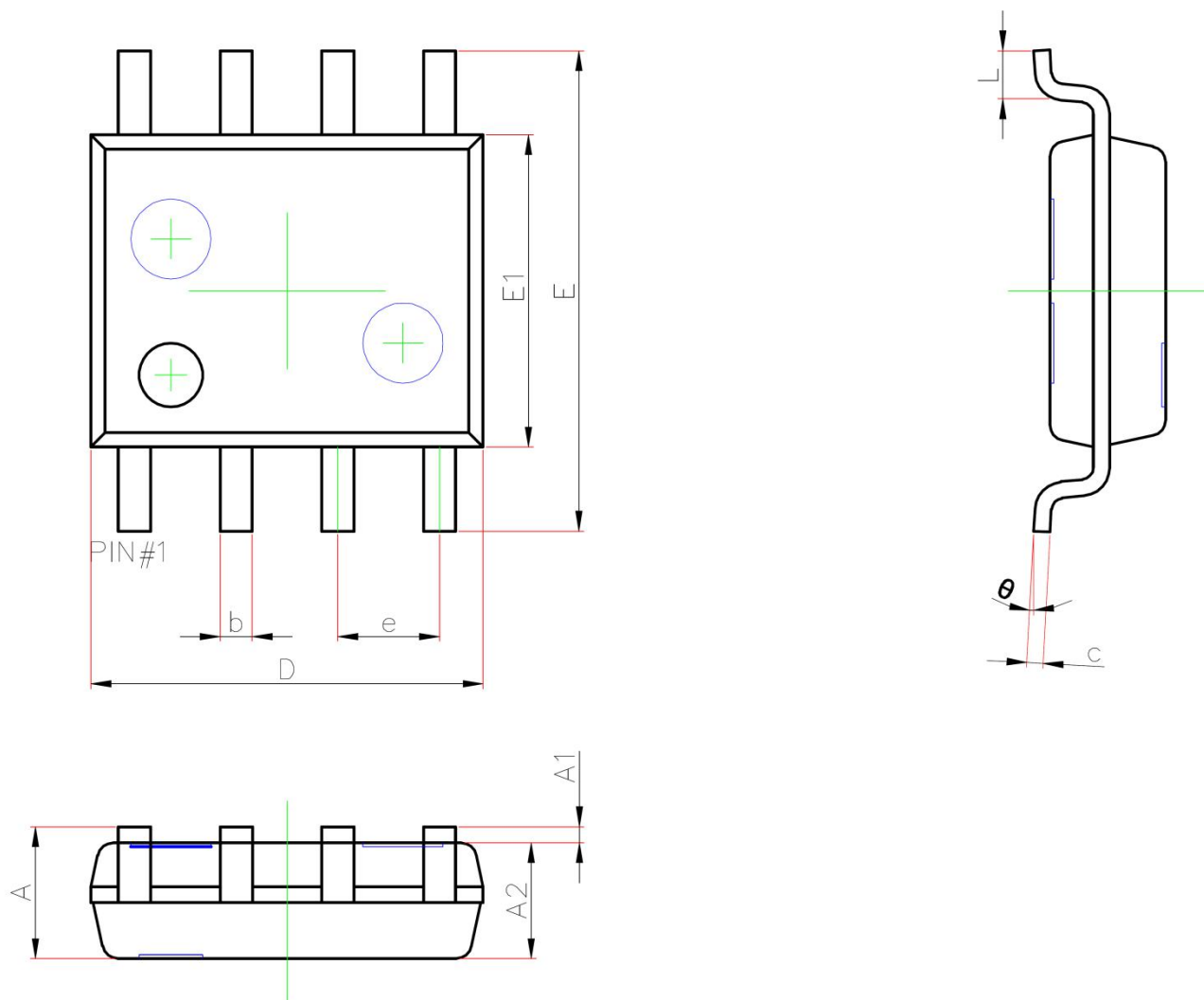


SOA, Safe Operation Area





SOP-8 Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.35	1.75
A1	0.10	0.25
A2	1.35	1.55
b	0.33	0.51
c	0.17	0.25
D	4.80	5.00
e	1.27 REF.	
E	5.80	6.20
E1	3.80	4.00
L	0.40	1.27
θ	0°	8°