

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	

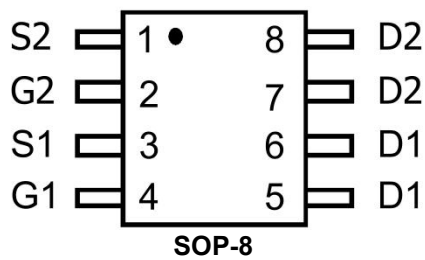
Feature

- TrenchFET Power MOSFET
- Excellent RDS(on) and Low Gate Charge

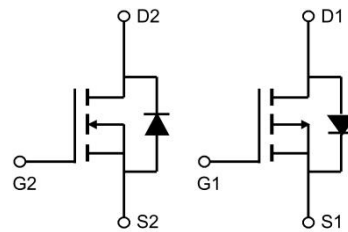
Application

- Load Switch for Portable Devices
- Battery Switch

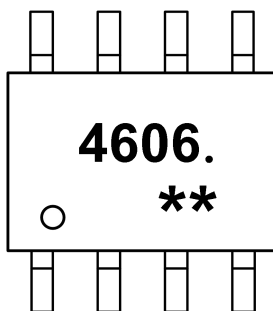
Package



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		$^{\circ}C/W$
Junction Temperature	T_J	150		$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150		$^{\circ}C$

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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 0.1	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.5	2.2	V
Drain-source on-resistance ¹⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 1A$		16	20	m Ω
		$V_{GS} = 4.5V, I_D = 1A$		24	32	
Dynamic characteristics²⁾						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		513		pF
Output Capacitance	C_{oss}			69		
Reverse Transfer Capacitance	C_{rss}			51		
Switching Characteristics						
Total gate charge@4.5V	Q_g	$V_{DS}=20V, V_{GS}=4.5V, I_D=6A$		5		nC
Gate-source charge	Q_{gs}			1.11		
Gate-drain charge	Q_{gd}			2.61		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=12V, V_{GS}=10V, RG=3.3, I_D=6A$		7.7		ns
Turn-on rise time	t_r			46		
Turn-off delay time	$t_{d(off)}$			11		
Turn-off fall time	t_f			3.6		
Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}C$			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.

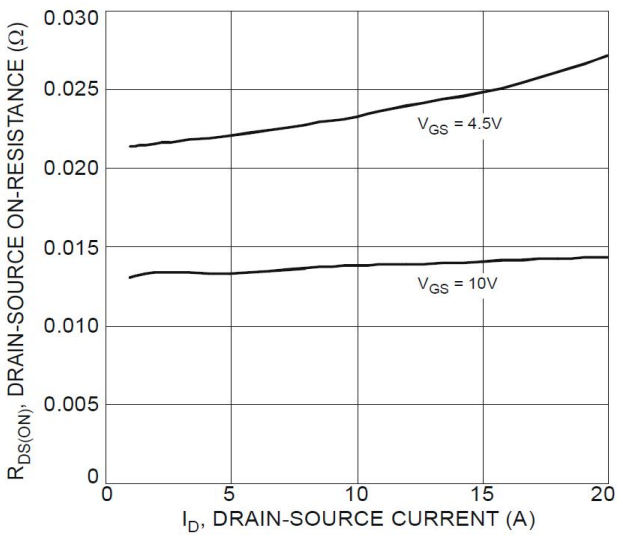
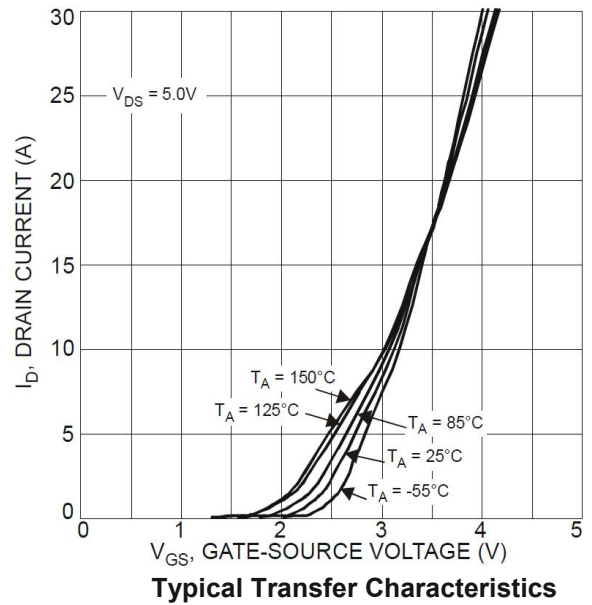
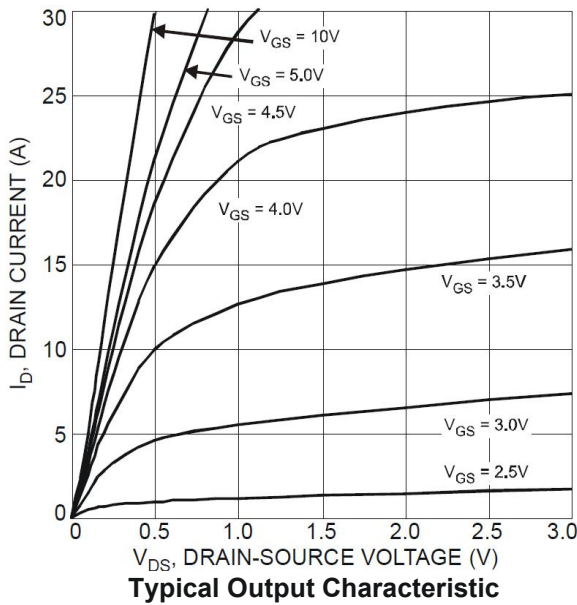
P-Channel Electrical characteristics (T_A=25 °C, unless otherwise noted)

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 characteristics²⁾						
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

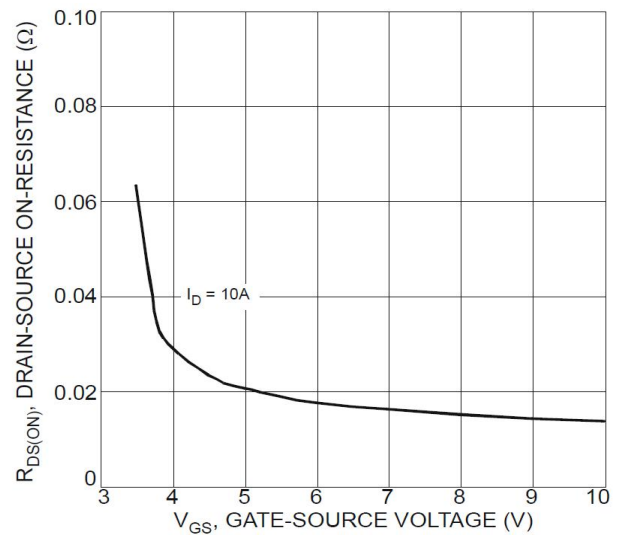
Notes:

- 1) Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%.
- 2) These parameters have no way to verify.

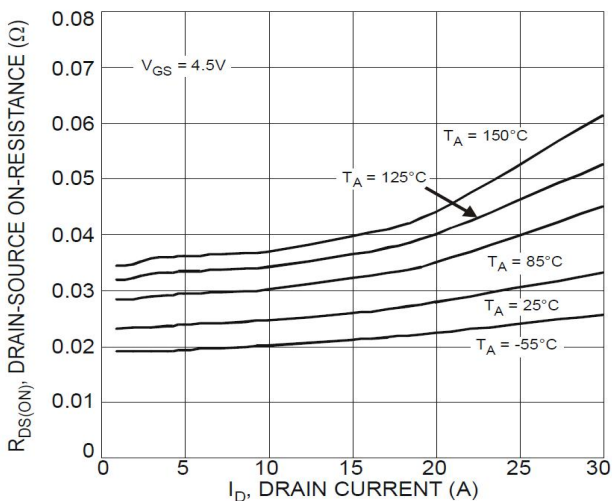
N-Channel Typical Characteristics



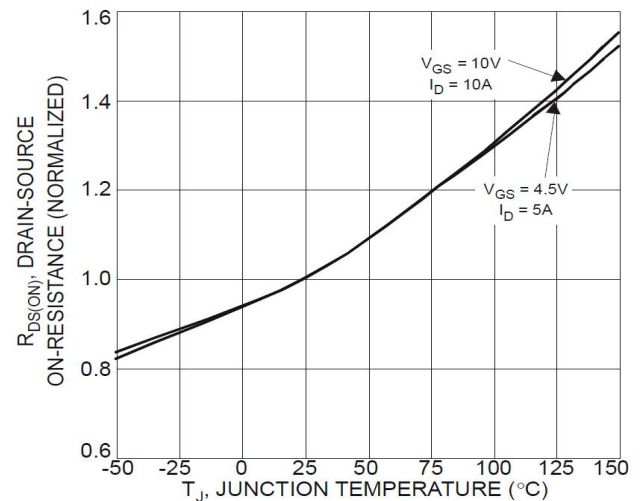
On-Resistance vs. Drain Current and Gate Voltage



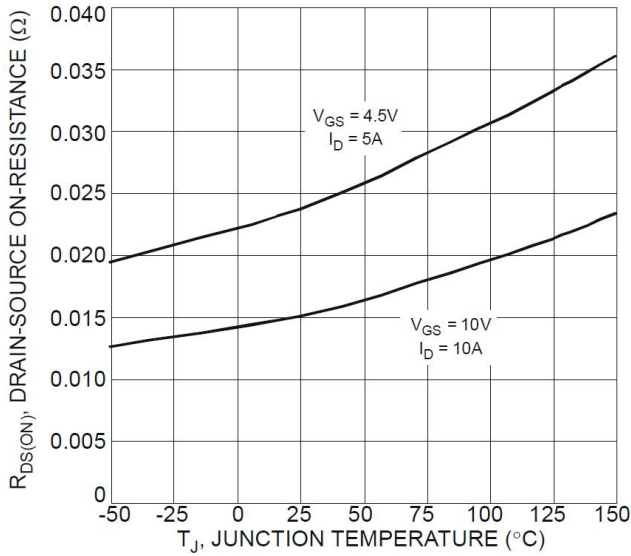
On-Resistance vs. Drain Current and Gate Voltage



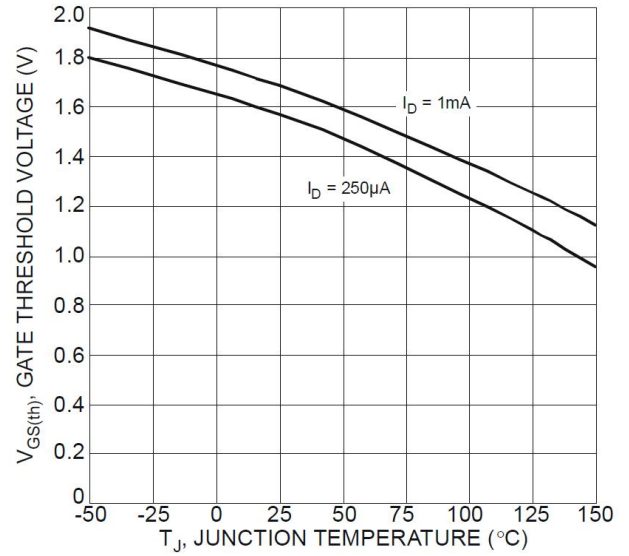
On-Resistance vs. Drain Current and Temperature



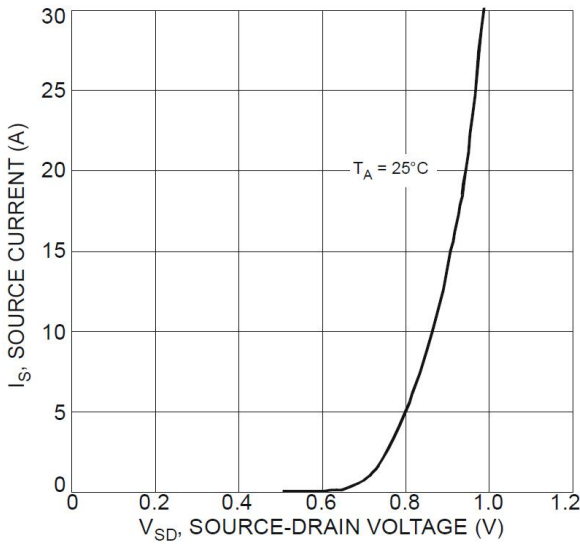
On-Resistance Variation with Temperature



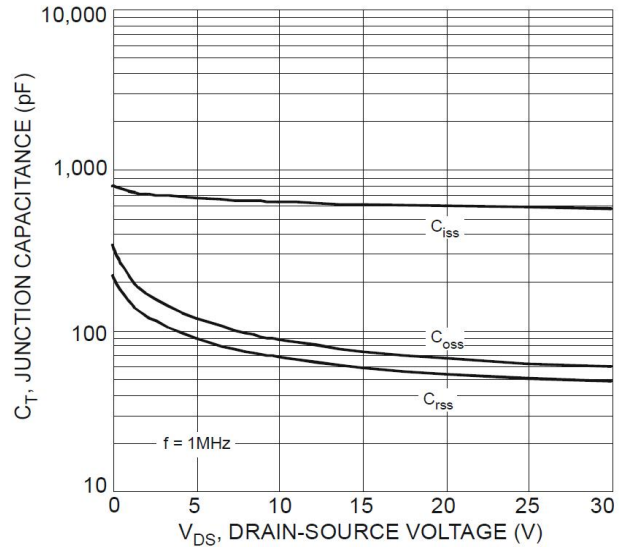
On-Resistance Variation with Temperature



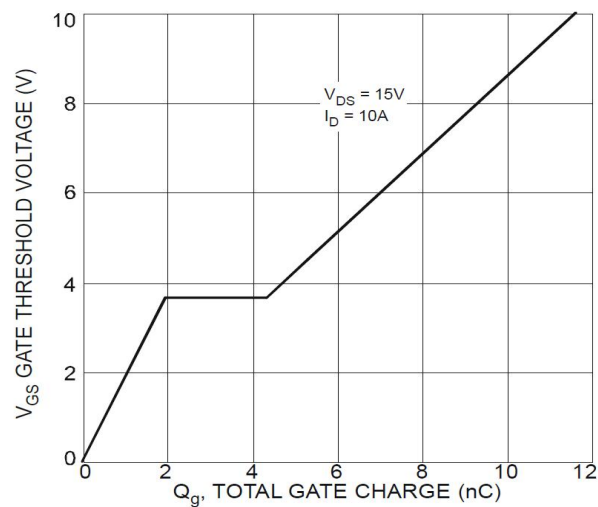
Gate Threshold Variation vs. Ambient Temperature



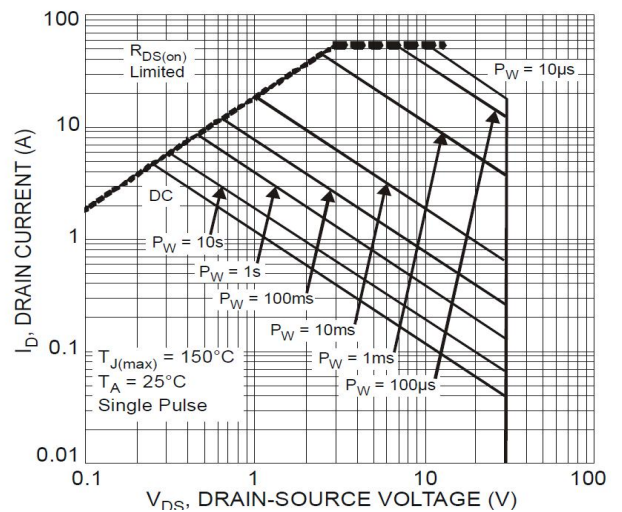
Diode Forward Voltage vs. Current



Typical Junction Capacitance

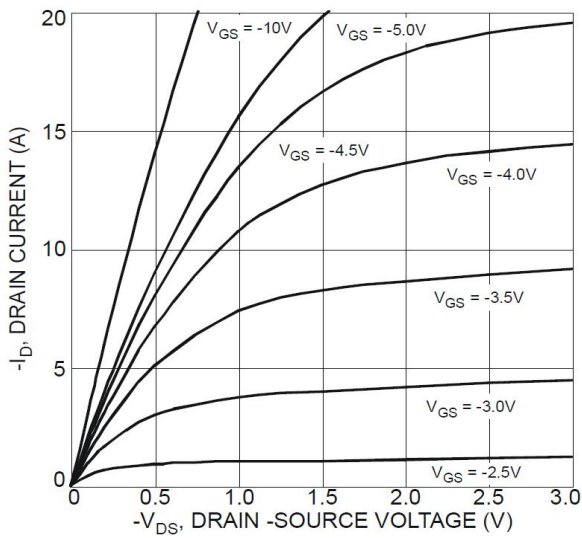


Gate Charge

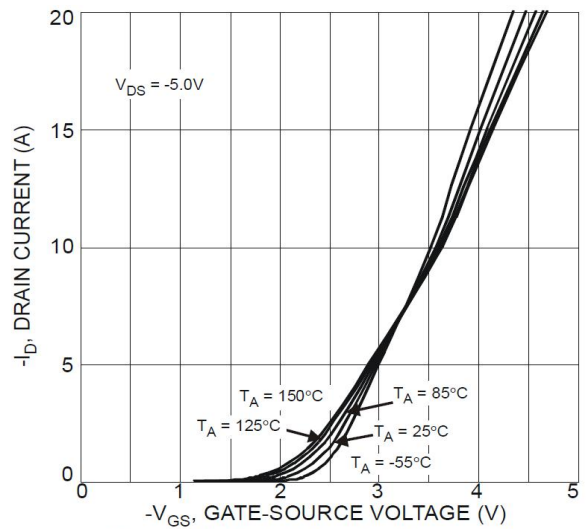


SOA, Safe Operation Area

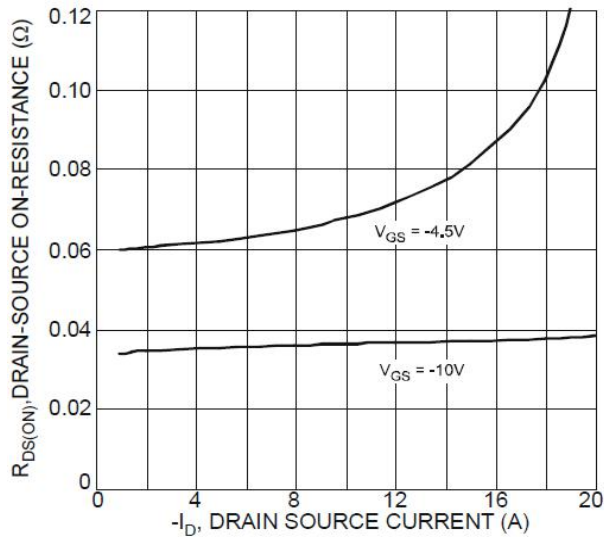
P-Channel Typical Characteristics



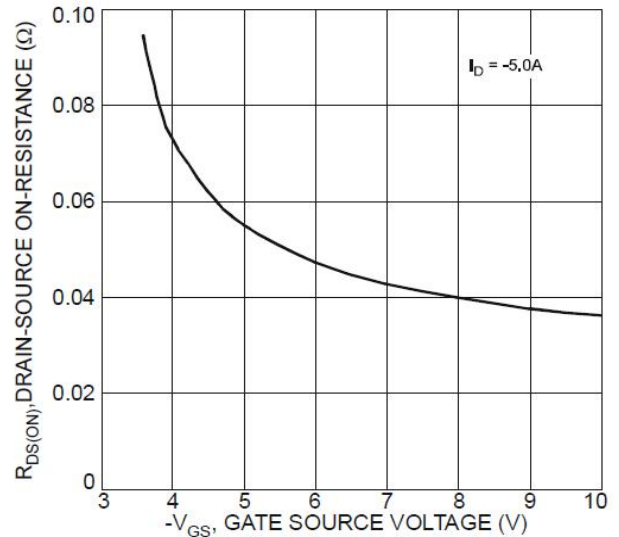
Typical Output Characteristics



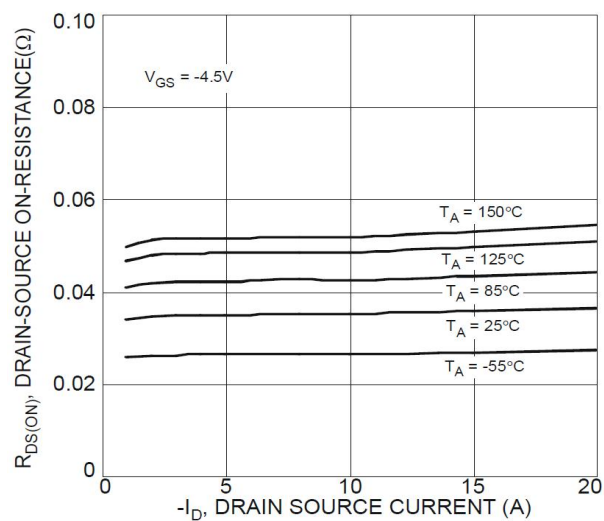
Typical Transfer Characteristics



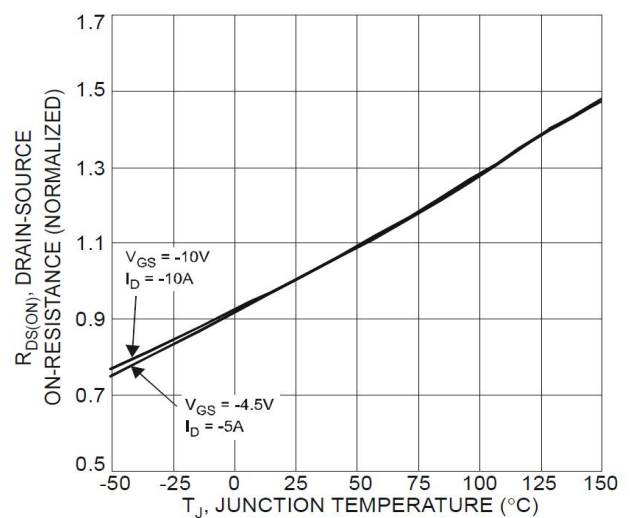
On-Resistance vs. Drain Current and Gate Voltage



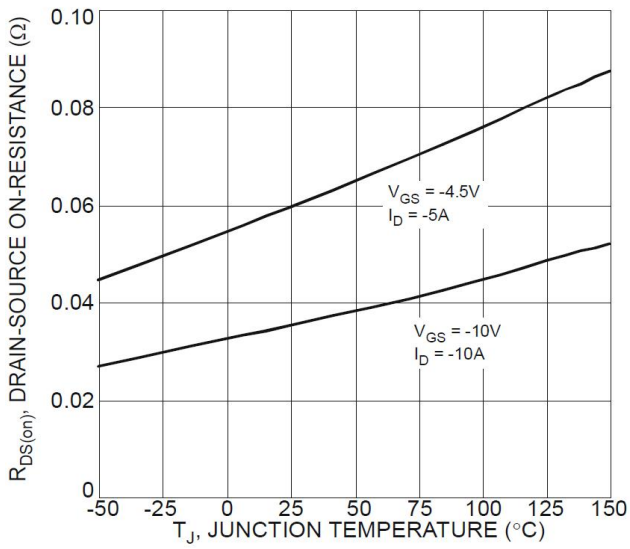
On-Resistance vs. Drain Current and Gate Voltage



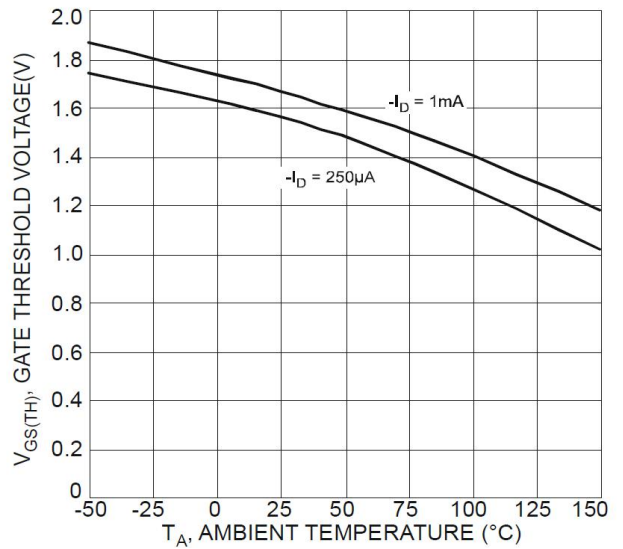
On-Resistance vs. Drain Current and Temperature



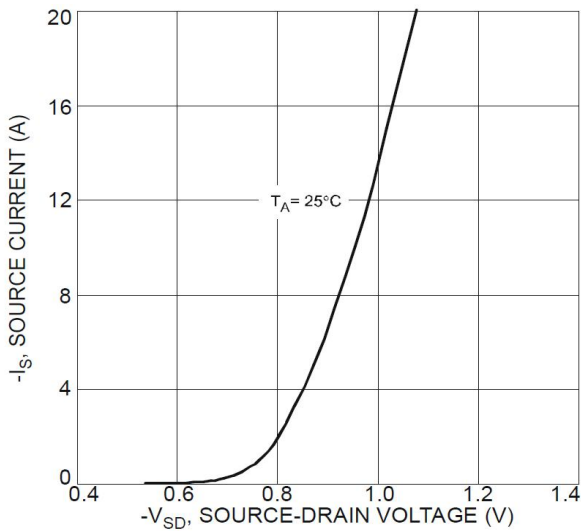
On-Resistance Variation with Temperature



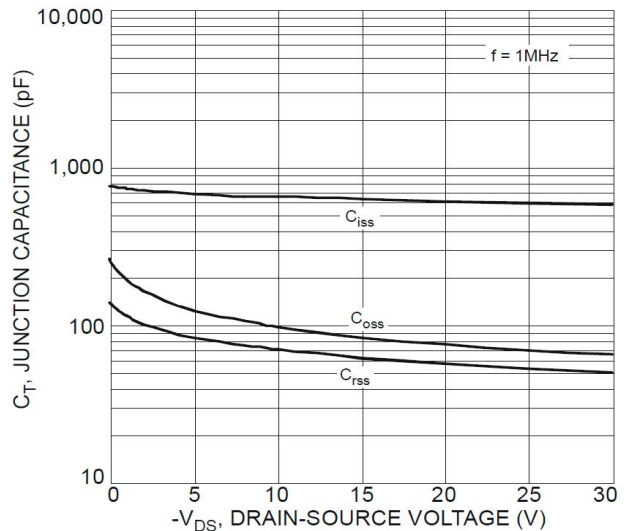
On-Resistance Variation with Temperature



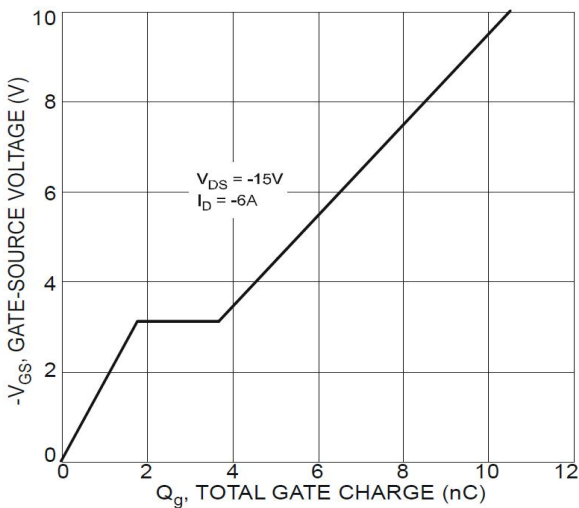
Gate Threshold Variation vs. Ambient Temperature



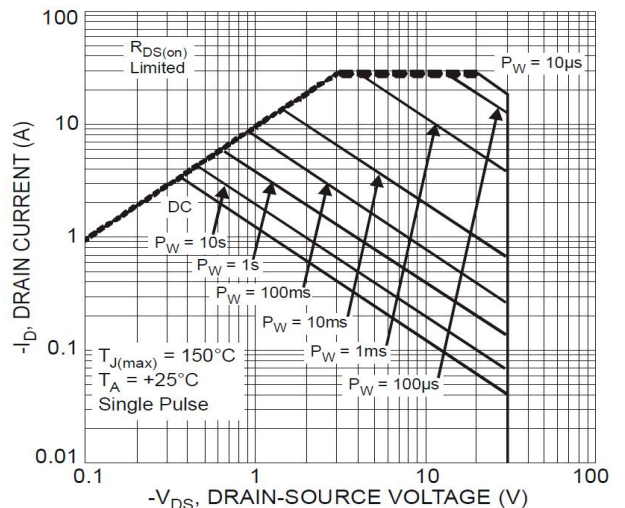
Diode Forward Voltage vs. Current



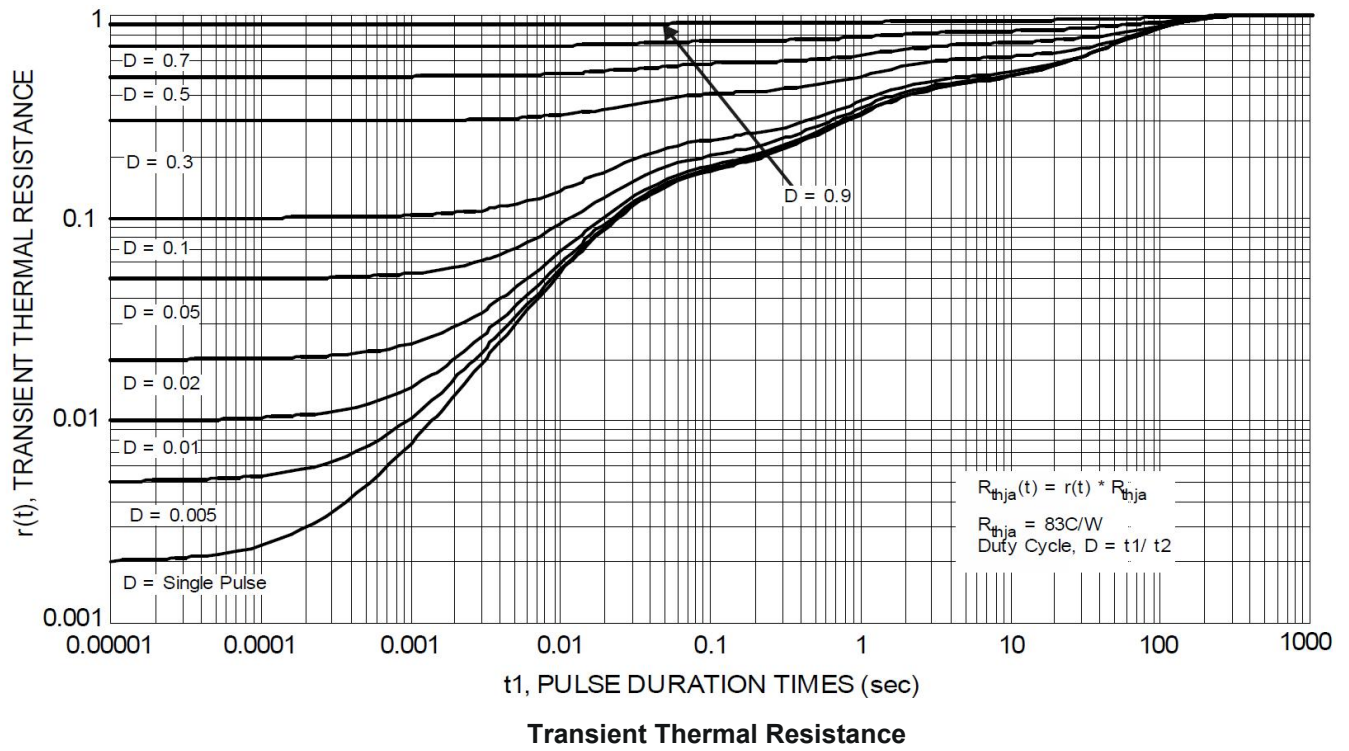
Typical Junction Capacitance

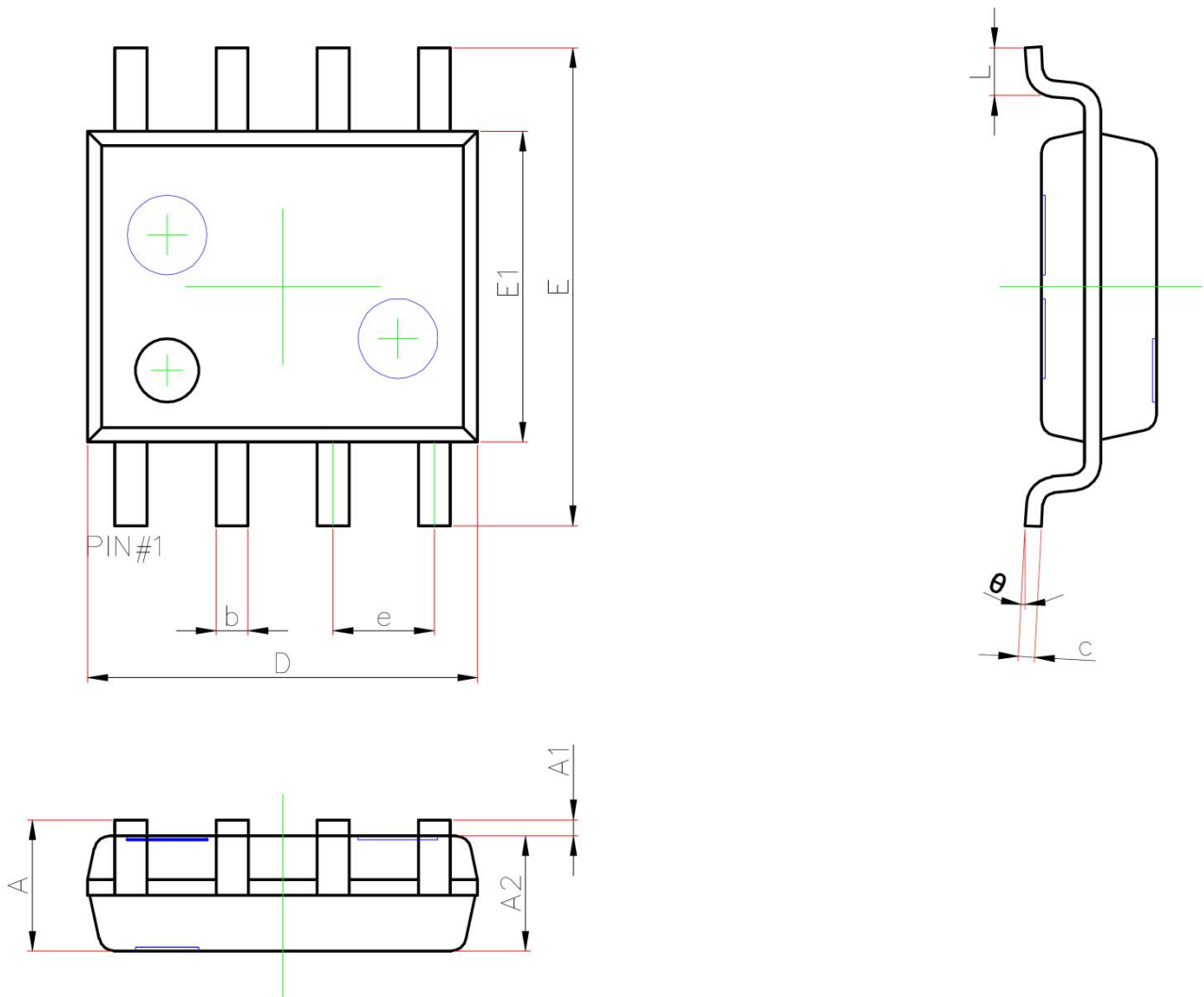


Gate-Charge Characteristics



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°

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