

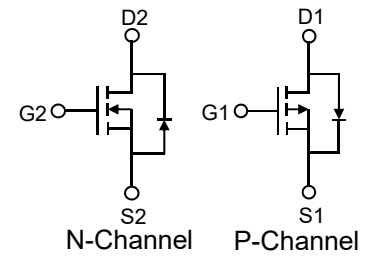
N-Channel and P-Channel MOSFET

Description

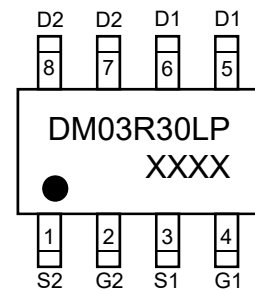
The PDM8P03R30L uses advanced trench technology to provide excellent $R_{DS(on)}$ and low gate charge. This device is suitable for power management and high efficiency applications at high switching frequencies applications.

MOSFET Product Summary

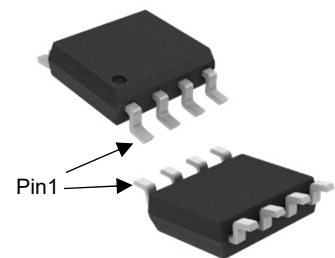
$V_{DS}(V)$	$R_{DS(on)}(m\Omega)(Typ)$	$I_D(A)$
N-Channel 30	17.5@ $V_{GS} = 10V$	7.0
	27.5@ $V_{GS} = 4.5V$	
P-Channel -30	25.5@ $V_{GS} = -10V$	-6.8
	33.8@ $V_{GS} = -4.5V$	



Circuit Diagram



Marking (Top View)



SOP-8L

Feature

- Low Gate Charge
- High Power and current handling capability
- Lead free product is acquired

Applications

- Battery Protection
- Power Management
- Load Switch

Absolute maximum rating@25°C

Rating		Symbol	N-Channel	P-Channel	Units
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	± 20	± 20	V
Drain Current-Continuous ¹⁾	$T_C = 25^\circ C$	I_D	7.0	-6.8	A
	$T_C = 100^\circ C$		4.4	-4.3	
Pulsed Drain Current ²⁾		I_{DM}	28	-27	A
Total Power Dissipation ³⁾		P_D	1.7	1.8	W
Avalanche Current ⁴⁾		I_{AS}	19	-23	A
Avalanche Energy ⁴⁾		E_{AS}	19	26	mJ
Thermal Resistance , Junction-to-Case ⁵⁾		$R_{\theta JC}$	14.9	13	$^\circ C/W$
Thermal Resistance Junction-to-Ambient ⁶⁾		$R_{\theta JA}$	72	68.2	$^\circ C/W$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	-55~+150	$^\circ C$

Electrical characteristics per line@25°C (unless otherwise specified)(N-Channel)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V	-	-	1.0	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.5	2.3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 6A	-	17.5	21	mΩ
		V _{GS} = 4.5V, I _D = 6A	-	27.5	34	
Dynamic Characteristics ⁷⁾						
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f=1MHz	-	525	-	pF
Output Capacitance	C _{oss}		-	86	-	
Reverse Transfer Capacitance	C _{rss}		-	65	-	
Switching Characteristics ⁷⁾						
Turn-on Delay Time	t _{d(on)}	V _{DS} = 15V, I _D = 6A, V _{GS} = 10V, R _G = 3Ω	-	4.1	-	ns
Turn-on Rise Time	t _r		-	3.4	-	
Turn-Off Delay Time	t _{d(off)}		-	13.2	-	
Turn-Off Fall Time	t _f		-	3.7	-	
Total Gate Charge	Q _g	V _{DS} = 15V, I _D = 6A, V _{GS} = 10V	-	10.6	-	nC
Gate-Source Charge	Q _{gs}		-	1.1	-	
Gate-Drain Charge	Q _{gd}		-	2.4	-	
Gate Resistance	R _g	f=1MHz, Open Drain	-	2.3	-	Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = 6A	-	0.8	1.2	V

Electrical characteristics per line@25°C (unless otherwise specified)(P-Channel)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250μA	-30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30V, V _{GS} = 0V	-	-	-1.0	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.5	-2.3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = -10V, I _D = -6A	-	25.5	32	mΩ
		V _{GS} = -4.5V, I _D = -6A	-	33.8	43	
Dynamic Characteristics ⁷⁾						
Input Capacitance	C _{iss}	V _{DS} = -15V, V _{GS} = 0V, f = 1MHz	-	786	-	pF
Output Capacitance	C _{oss}		-	105	-	
Reverse Transfer Capacitance	C _{rss}		-	87	-	
Switching Characteristics ⁷⁾						
Turn-on Delay Time	t _{d(on)}	V _{DS} = -15V, V _{GS} = -10V, R _G = 6Ω, I _D = -6A	-	6.0	-	ns
Turn-on Rise Time	t _r		-	14	-	
Turn-Off Delay Time	t _{d(off)}		-	36	-	
Turn-Off Fall Time	t _f		-	22	-	
Total Gate Charge	Q _g	V _{DS} = -15V, V _{GS} = -10V, I _D = -6A	-	13.7	-	nC
Gate-Source Charge	Q _{gs}		-	2.2	-	
Gate-Drain Charge	Q _{gd}		-	2.9	-	
Gate Resistance	R _g	f=1MHz, Open Drain	-	6.5	-	Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _S = -6A	-	-0.8	-1.2	V

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. Repetitive Rating: Pulse width limited by maximum junction temperature($T_{J_Max}=150^\circ C$).
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. This single-pulse measurement was taken under the following condition (NMOS:L=0.1mH, $V_{GS}=10V, V_{DS}=30V$; PMOS:L= 0.1mH, $V_{GS}=-10V, V_{DS}=-30V$)while it's value is limited by $T_{J_Max}=150^\circ C$.
5. Device mounted on infinite heatsink.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout .
7. Guaranteed by design, not subject to production.

Typical Characteristics(N-Channel)

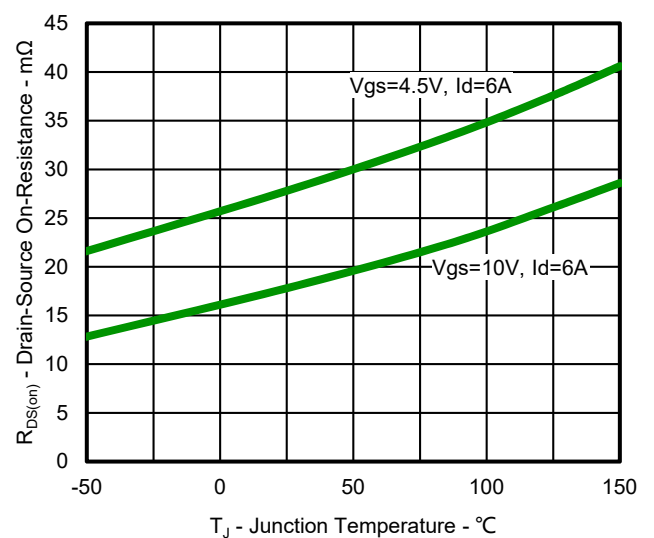
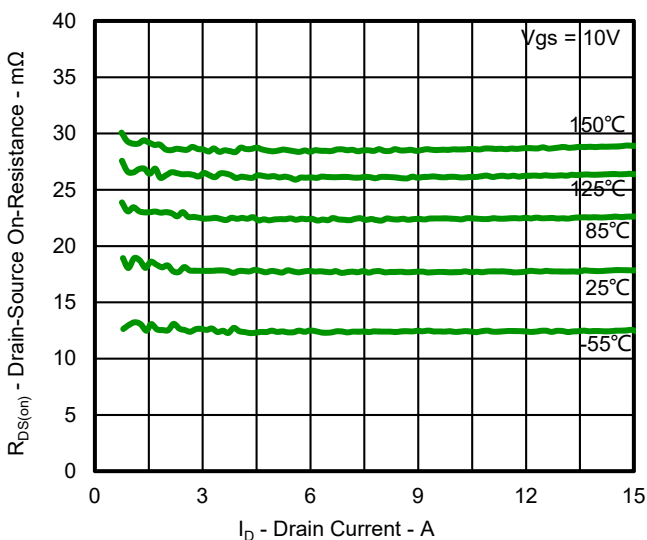
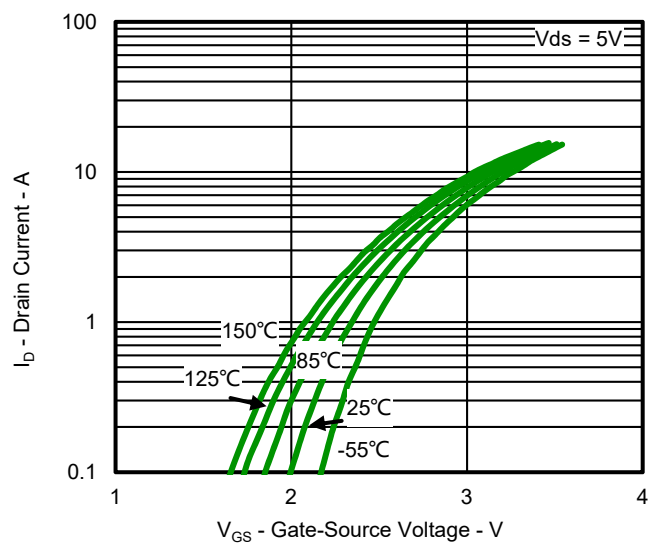
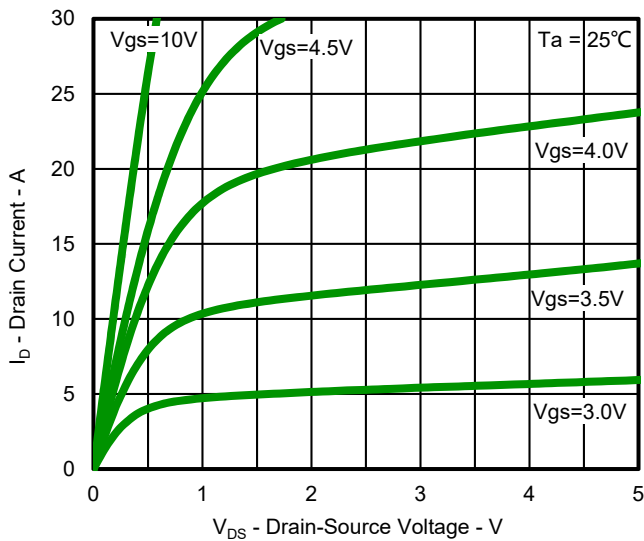


Fig.3 Typical On-Resistance vs Drain Current and Temperature

Fig.4 On-Resistance Variation with Temperature

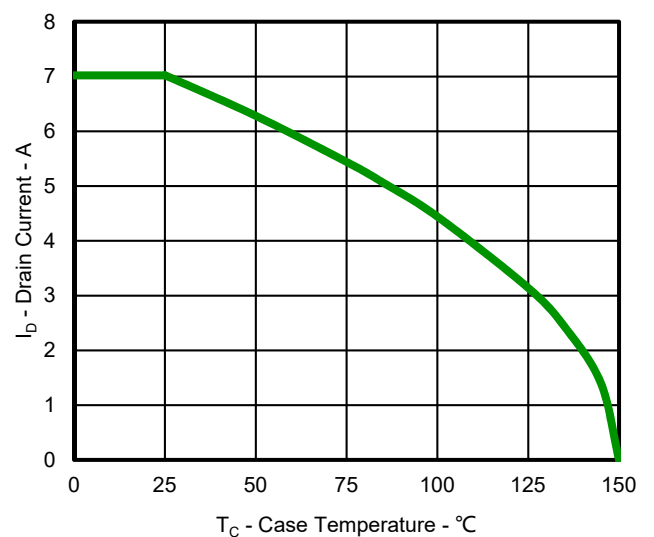
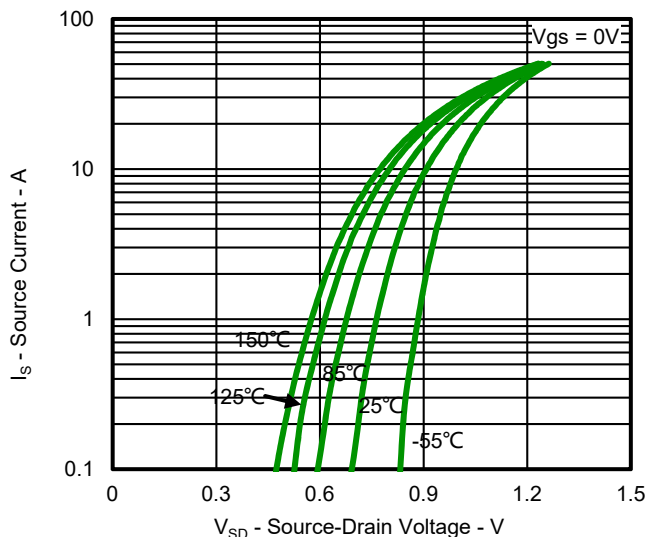
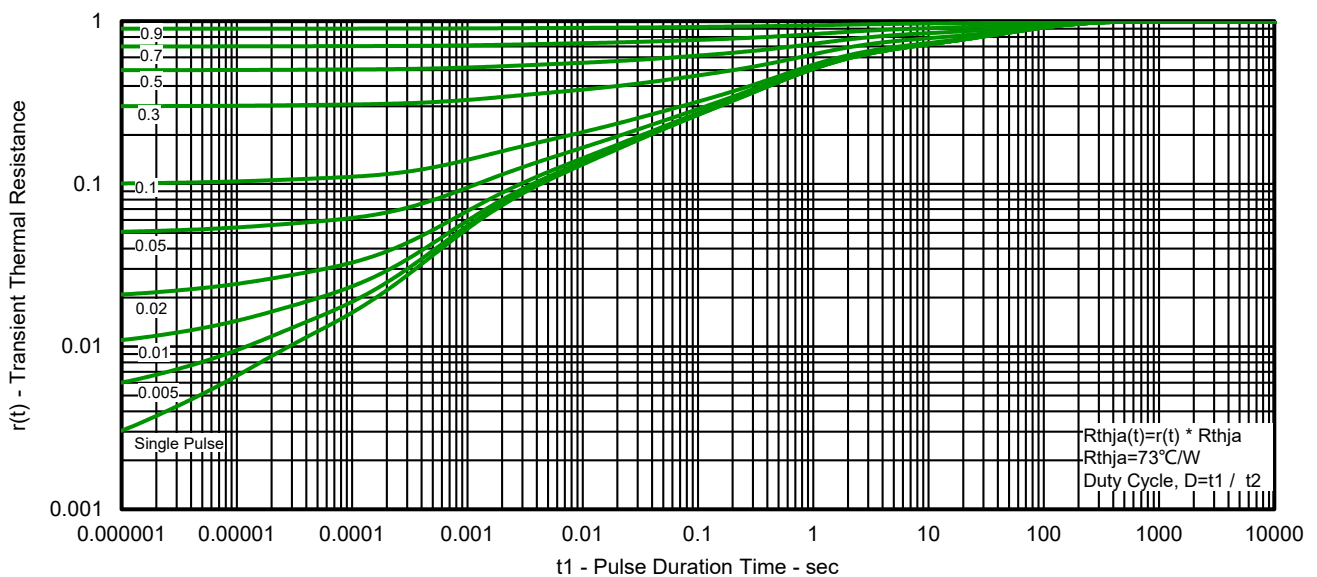
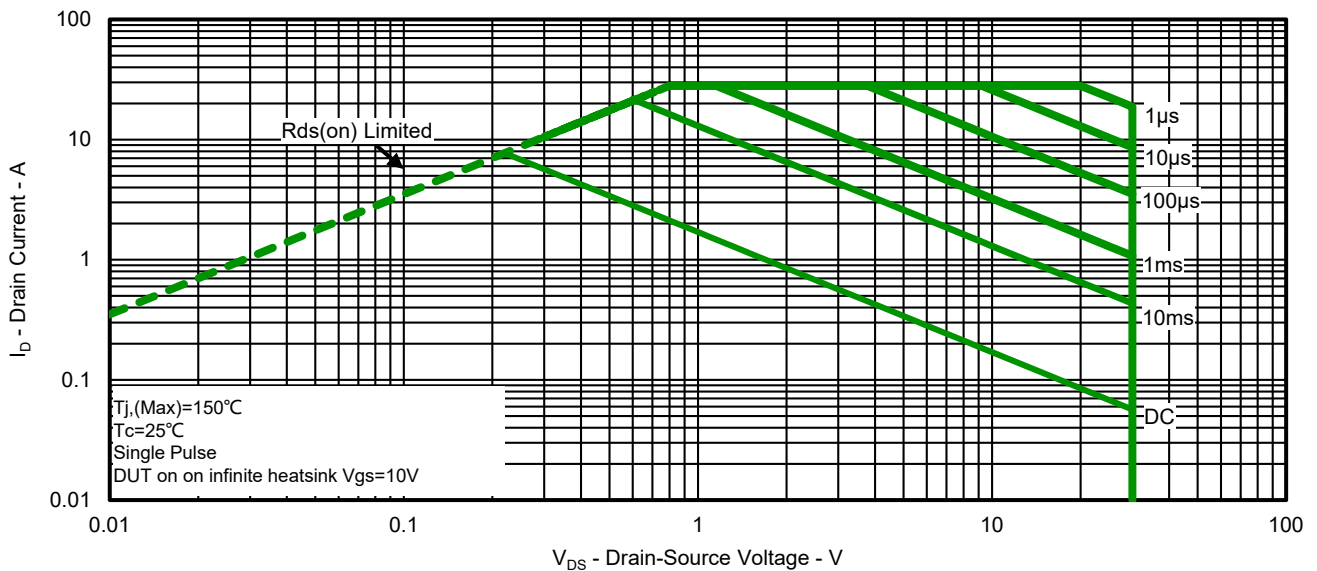
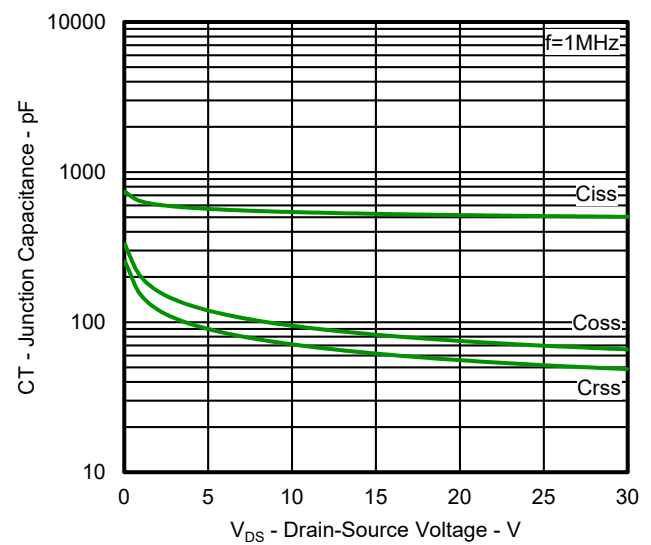
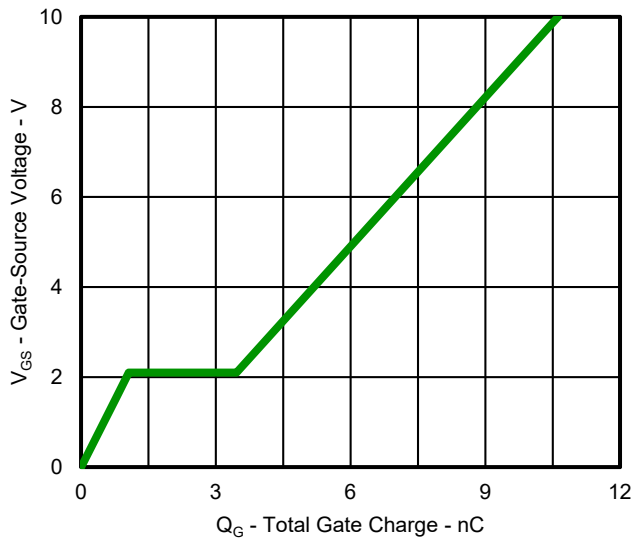


Fig.5 Diode Forward Voltage vs. Current

Fig.6 Maximum Drain Current vs. Case Temperature



Typical Characteristics(P-Channel)

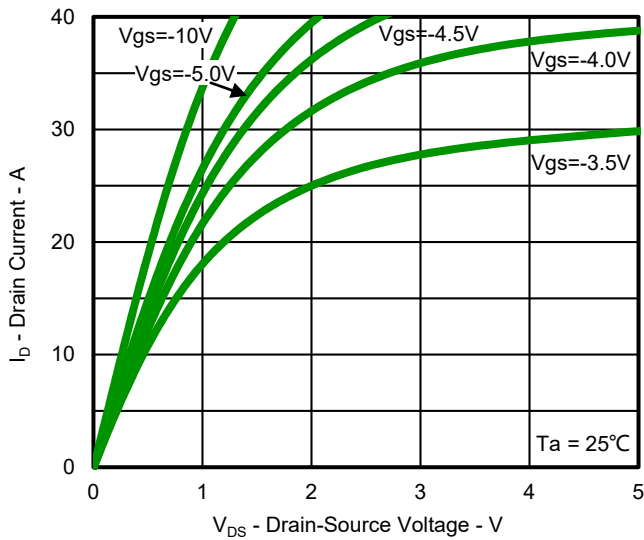


Fig.1 Output Characteristics

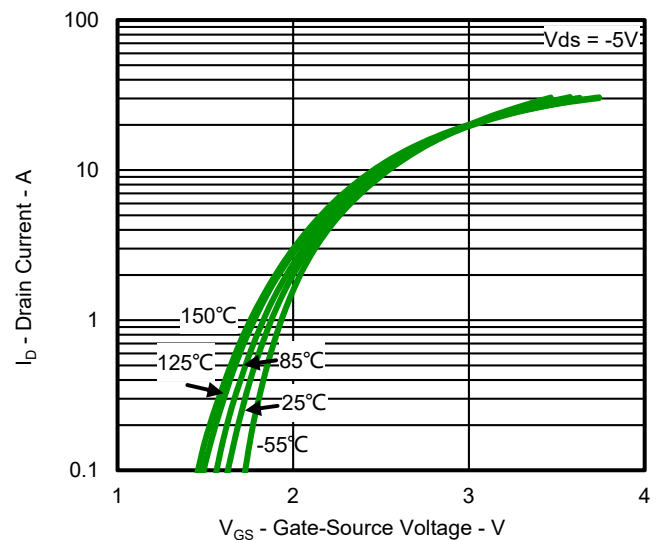


Fig.2 Typical Transfer Characteristic

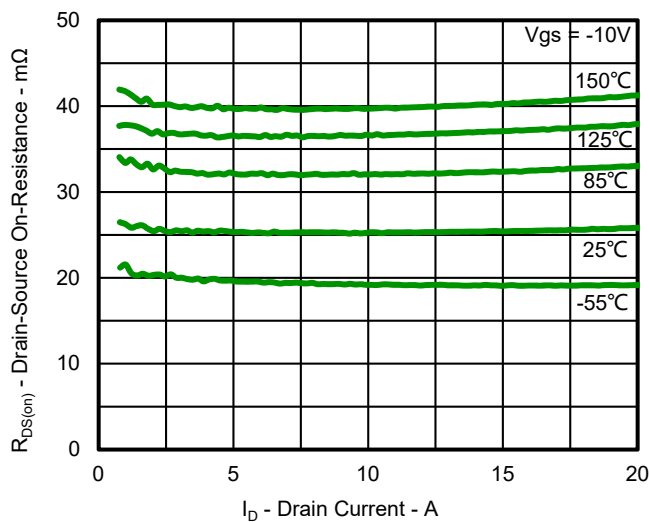


Fig.3 Typical On-Resistance vs Drain Current and Temperature

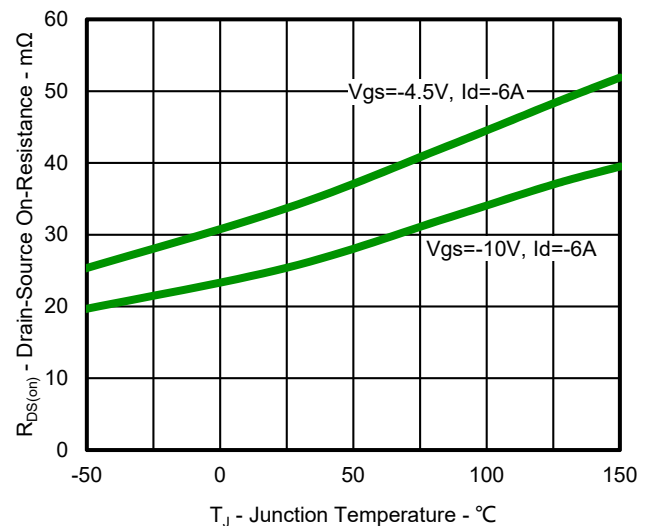


Fig.4 On-Resistance Variation with Temperature

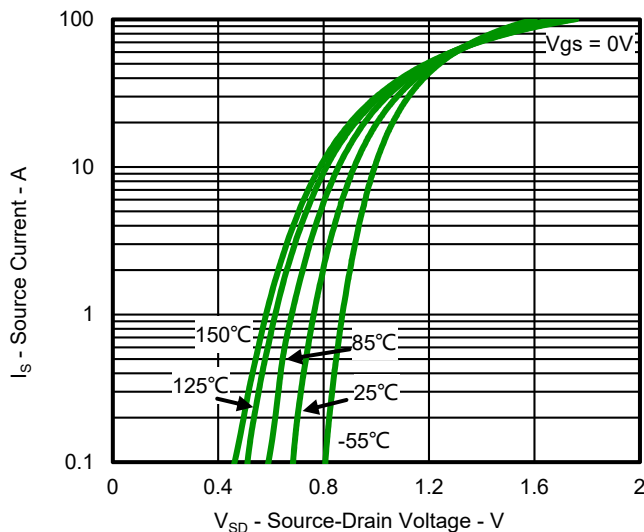


Fig.5 Diode Forward Voltage vs. Current

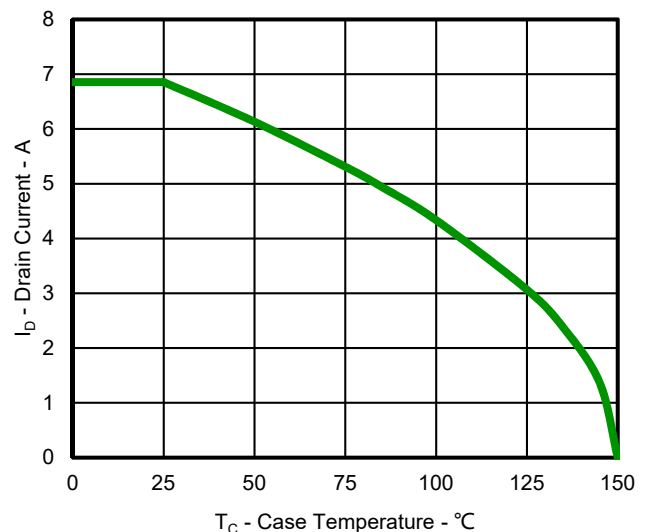


Fig.6 Maximum Drain Current vs. Case Temperature

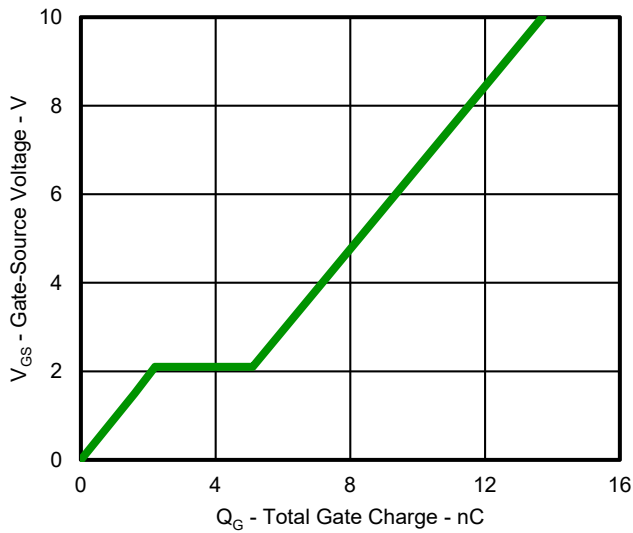


Fig.7 Gate Charge Characteristics

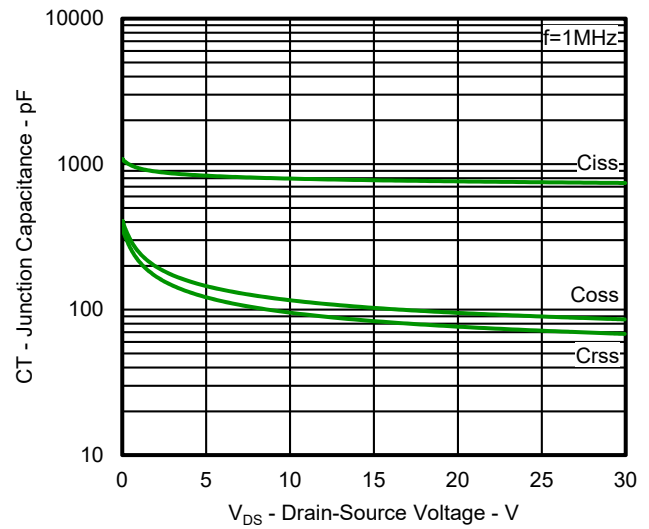


Fig.8 Typical Junction Capacitance

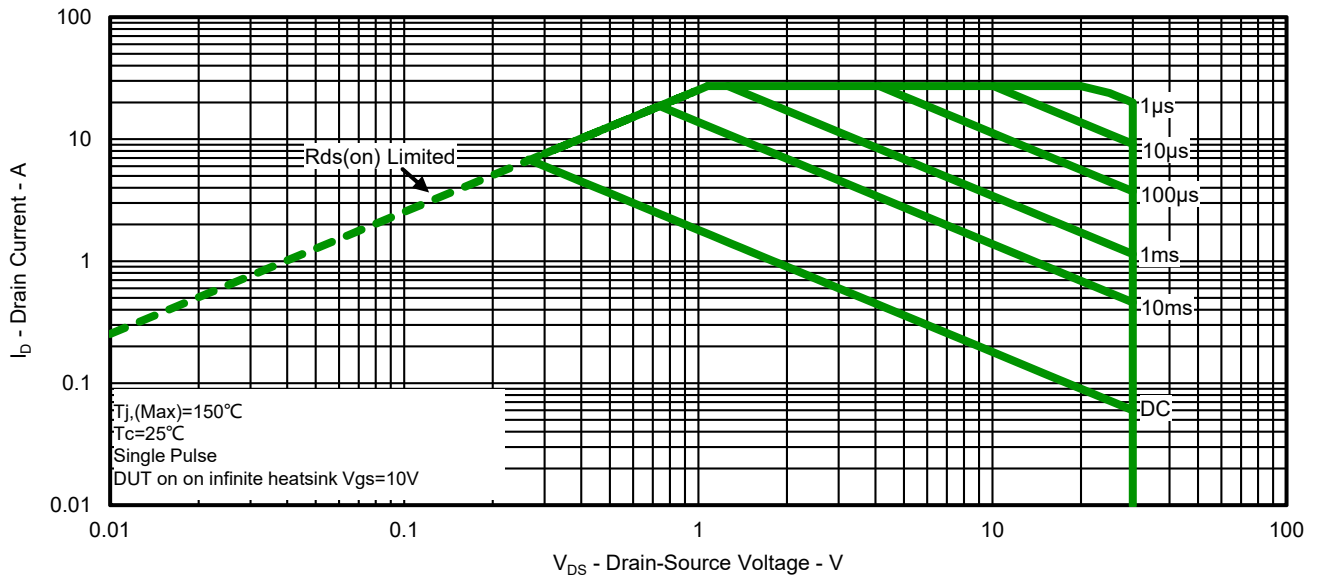


Fig.9 Safe Operation Area

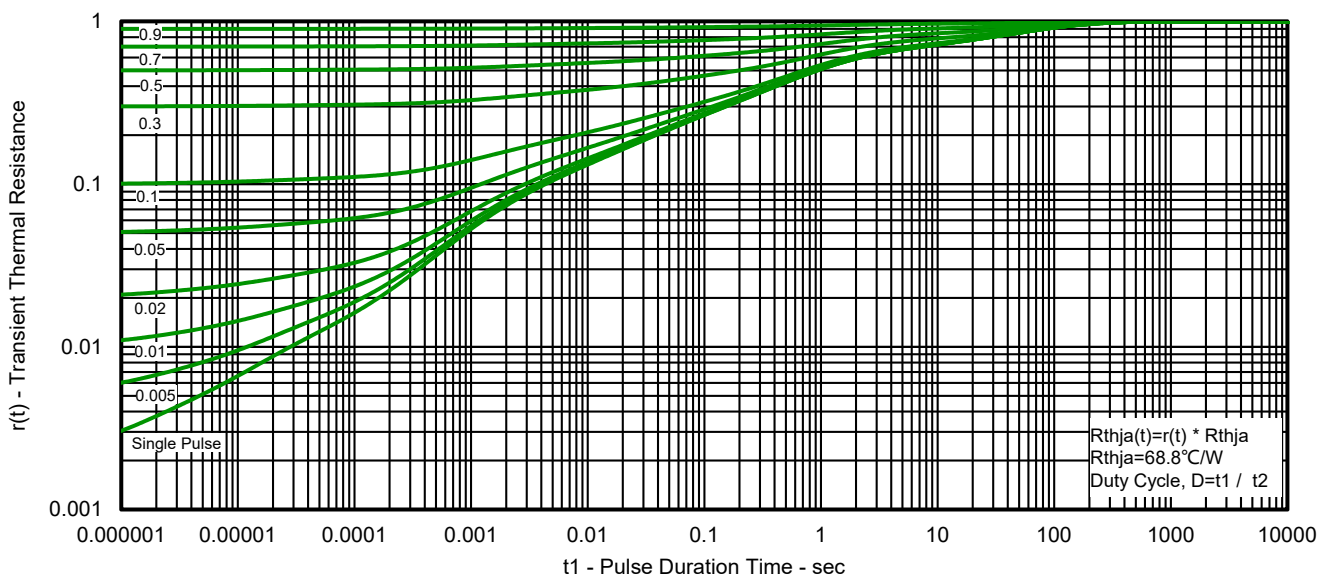
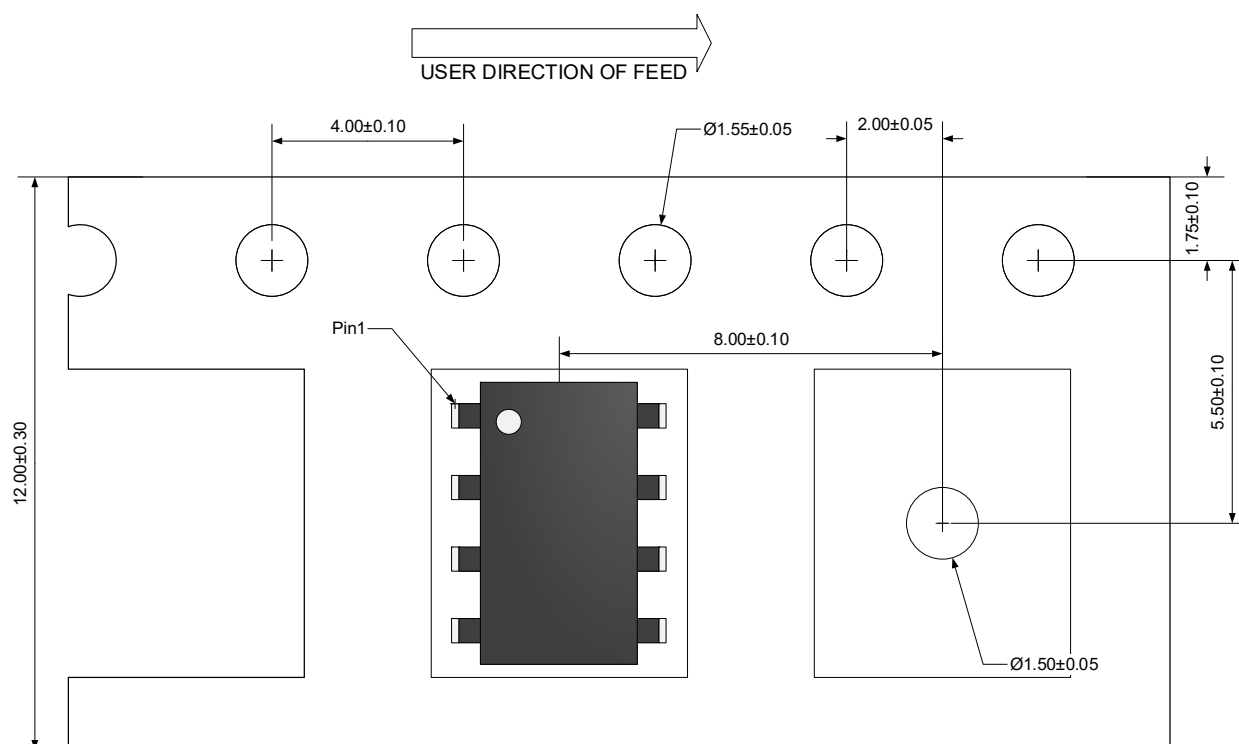


Fig.10 Transient Thermal Resistance

Load with information

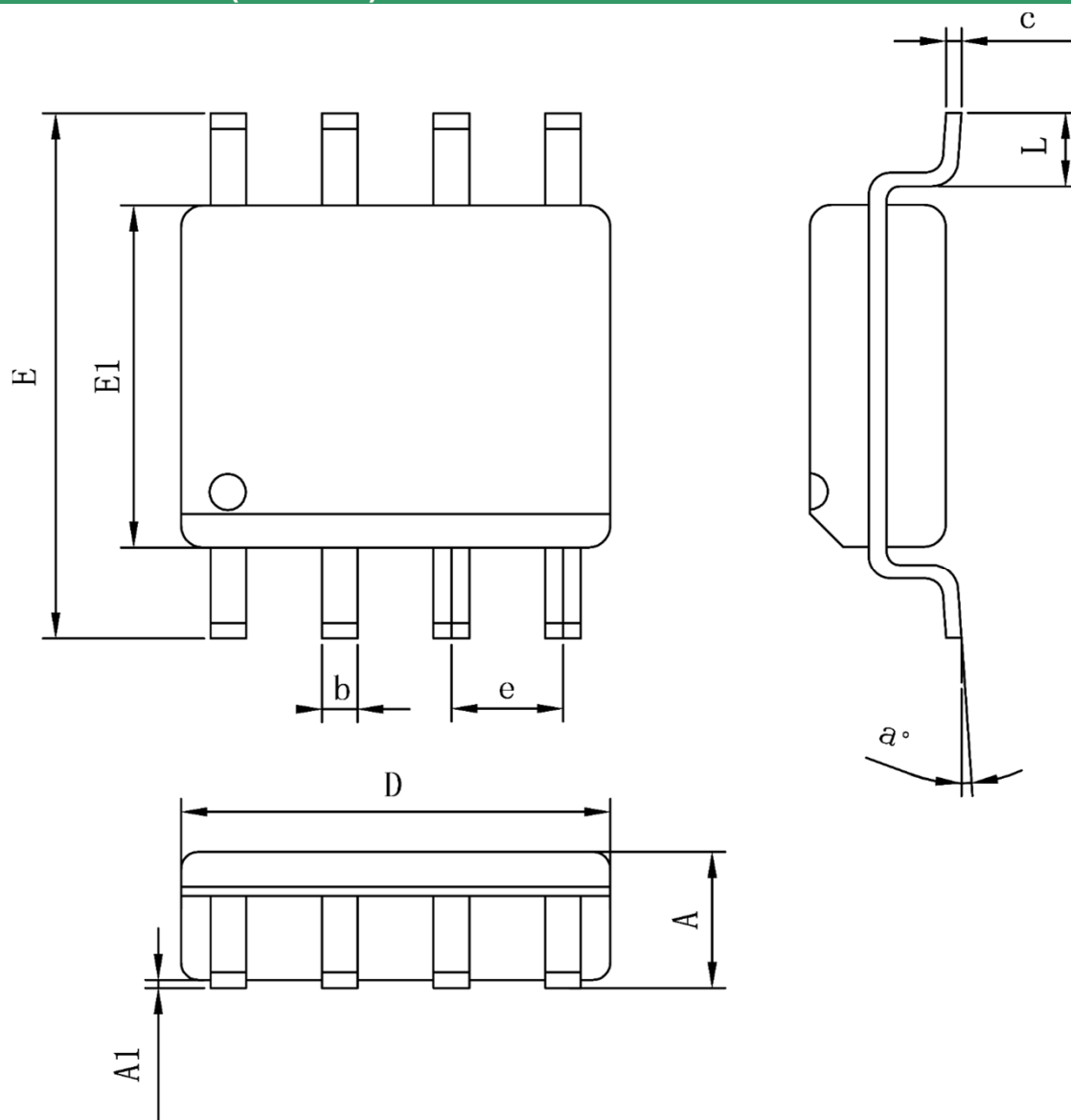


Unit:mm

Ordering information

Package	Reel	Shipping
SOP-8L	13"	3000 / Tape & Reel

Product Dimension (SOP-8L)



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	-	1.75	-	0.069
A1	0.10	0.23	0.004	0.009
b	0.35	0.48	0.014	0.019
c	0.19	0.25	0.007	0.010
D	4.70	5.00	0.185	0.197
E	5.80	6.20	0.228	0.244
E1	3.70	4.10	0.146	0.161
e	1.27(BSC)		0.050(BSC)	
L	0.50	0.80	0.020	0.031
α	0°	8°	0°	8°

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