

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	18mΩ@10V	7A
	24mΩ@4.5V	
-40V	33mΩ@-10V	-6A
	44mΩ@-4.5V	

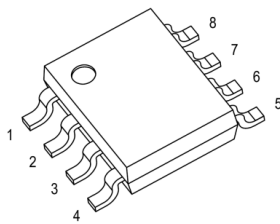
Feature

- High power and current handling capability
- Surface mount package

Application

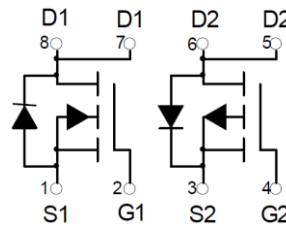
- Load Switch
- Battery Switch
- Power Management
- Motor Control

Package

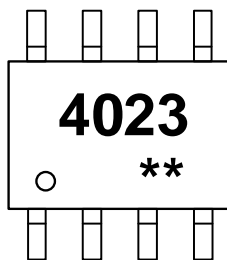


SOP-8L

Circuit diagram



Marking



4023 : Product 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}	40	-40	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current	I_D	7	-6	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	28	-24	A
Maximum Power Dissipation	P_D	1.8	1.8	W
Thermal Resistance from Junction to Ambient($t \leq 10s$)	$R_{\theta JA}$	69.5		°C/W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	-55 To 150	°C

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 32V, V_{GS} = 0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.6	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 5A$	-	19	25	m Ω
		$V_{GS} = 4.5V, I_D = 3A$	-	25	35	
Dynamic Characteristics ⁽³⁾						
Input Capacitance	C_{iss}	$V_{DS} = 20V, V_{GS} = 0V, f = 1MHz$	-	1060	-	PF
Output Capacitance	C_{oss}		-	84	-	
Reverse Transfer Capacitance	C_{rss}		-	58	-	
Switching Characteristics ⁽³⁾						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, R_G = 3\Omega, I_D = 5A$	-	5.3	-	nS
Turn-on Rise Time	t_r		-	7.1	-	
Turn-Off Delay Time	$t_{d(off)}$		-	15.8	-	
Turn-Off Fall Time	t_f		-	4.8	-	
Total Gate Charge	Q_g	$V_{DS} = 20V, V_{GS} = 4.5V, I_D = 7A$	-	8.8	-	nC
Gate-Source Charge	Q_{gs}		-	19.1	-	
Gate-Drain Charge	Q_{gd}		-	3.1	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ⁽²⁾	V_{SD}	$V_{GS} = 0V, I_S = 1A, T_J = 25^\circ C$	-	-	1.2	V

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250μA	-40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -40V, V _{GS} = 0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.5	-2.5	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -5A	-	31	40	mΩ
		V _{GS} = -4.5V, I _D = -3A	-	39	52	
Dynamic Characteristics ⁽³⁾						
Input Capacitance	C _{iss}	V _{DS} = -20V, V _{GS} = 0V, f = 1MHz	-	1034	-	PF
Output Capacitance	C _{oss}		-	107	-	
Reverse Transfer Capacitance	C _{rss}		-	79	-	
Switching Characteristics ⁽³⁾						
Turn-on Delay Time	t _{d(on)}	V _{DD} = -20V, V _{GS} = -10V, R _G = 2.5 Ω, I _D = -5A	-	8	-	nS
Turn-on Rise Time	t _r		-	15	-	
Turn-Off Delay Time	t _{d(off)}		-	23	-	
Turn-Off Fall Time	t _f		-	9	-	
Total Gate Charge	Q _g	V _{DS} = -20V, V _{GS} = -10V, I _D = -5A	-	20	-	nC
Gate-Source Charge	Q _{gs}		-	3.5	-	
Gate-Drain Charge	Q _{gd}		-	4.2	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ⁽²⁾	V _{SD}	V _{GS} = 0V, I _S = -1A, T _J = 25°C	-	-	-1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3. Guaranteed by design, not subject to production

N-Channel Typical Characteristics

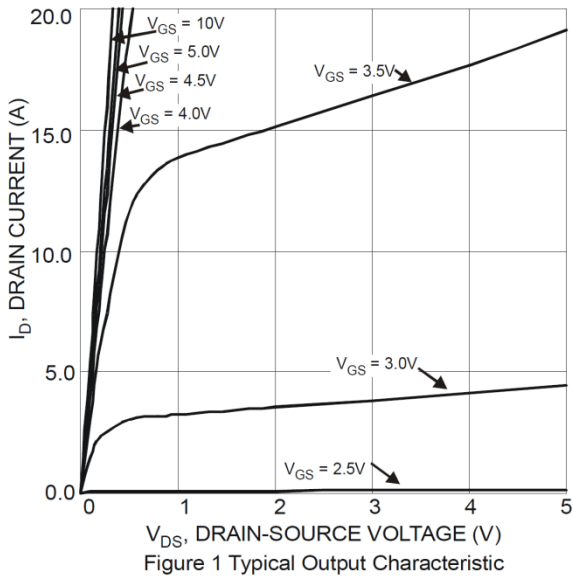


Figure 1 Typical Output Characteristic

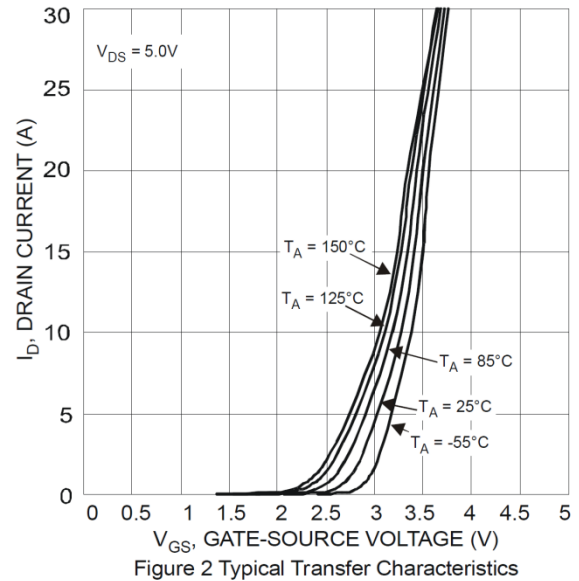


Figure 2 Typical Transfer Characteristics

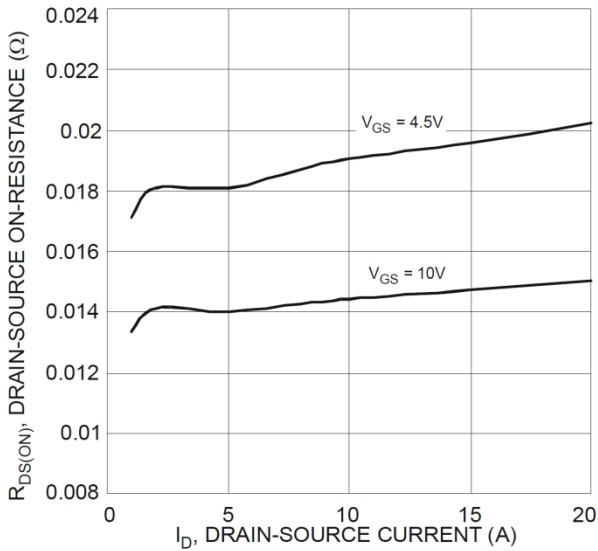


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

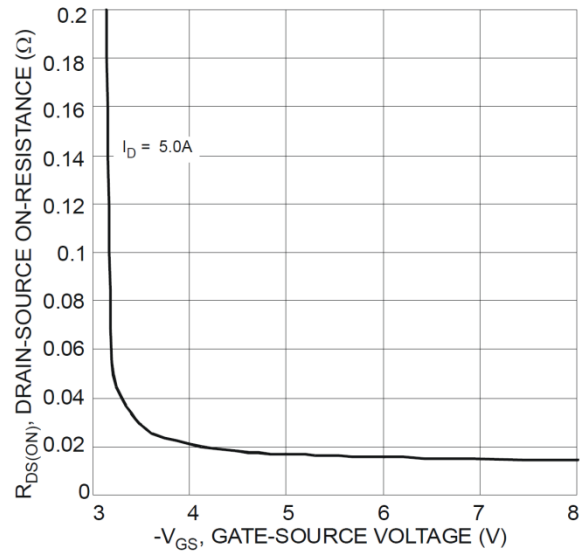


Figure 4 Typical Transfer Characteristic

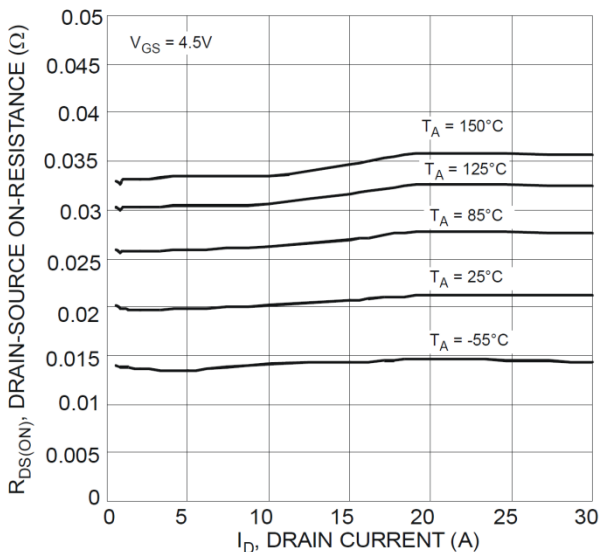


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

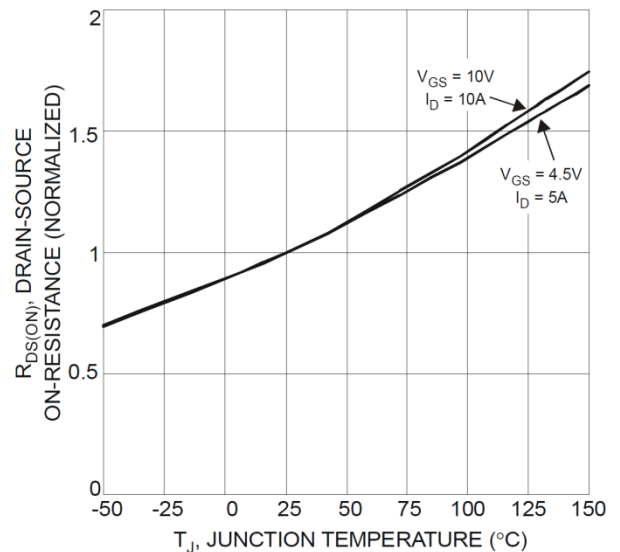


Figure 6 On-Resistance Variation with Temperature

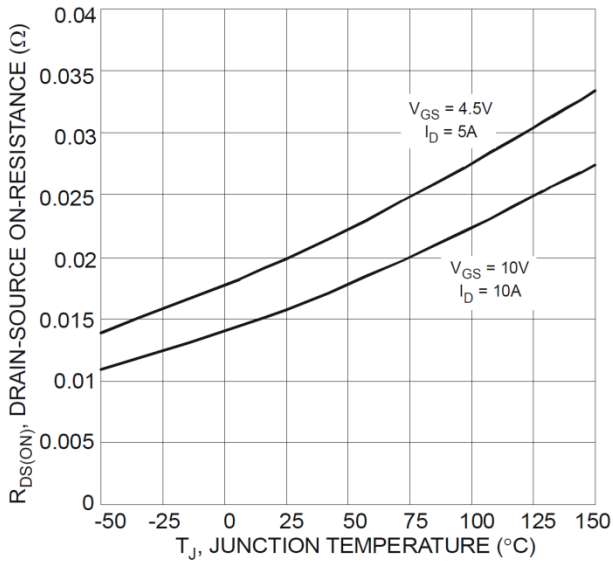


Figure 7 On-Resistance Variation with Temperature

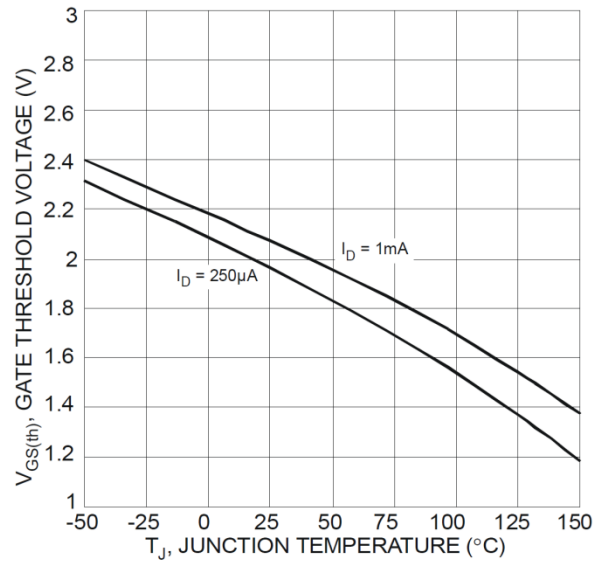


Figure 8 Gate Threshold Variation vs. Ambient Temperature

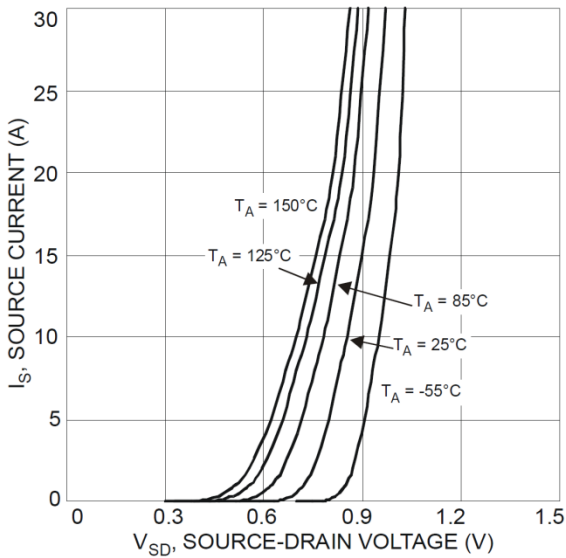
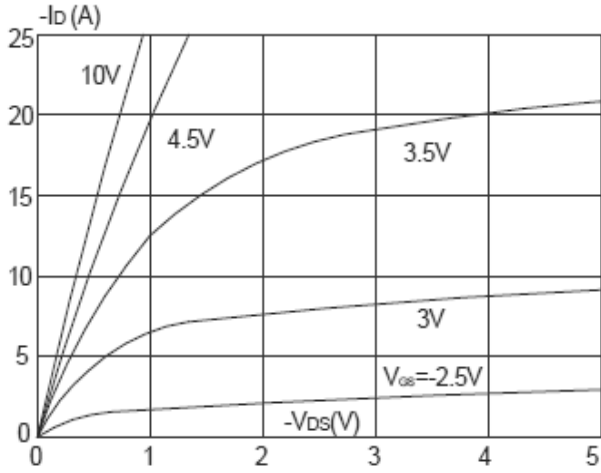


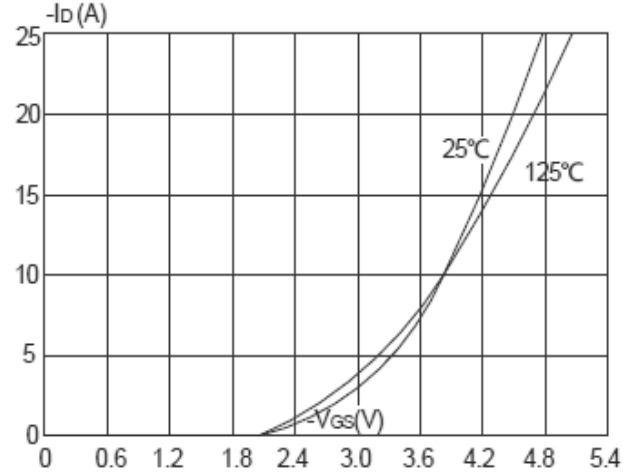
Figure 9 Diode Forward Voltage vs. Current

P-Channel Typical Characteristics

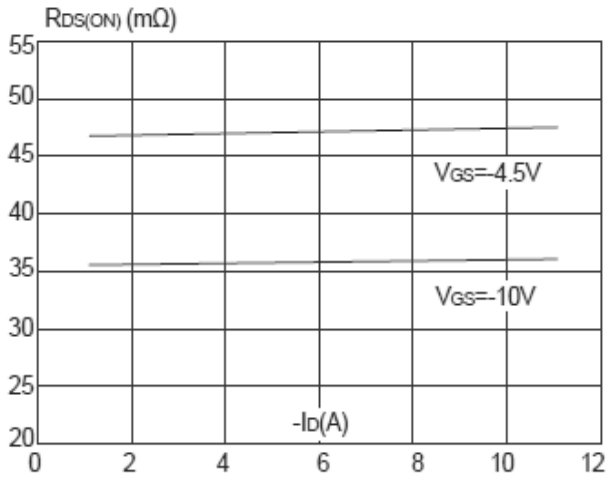
Output Characteristics



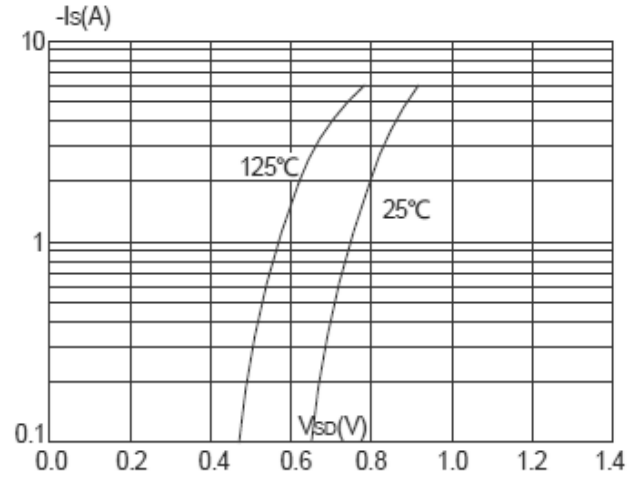
Typical Transfer Characteristics



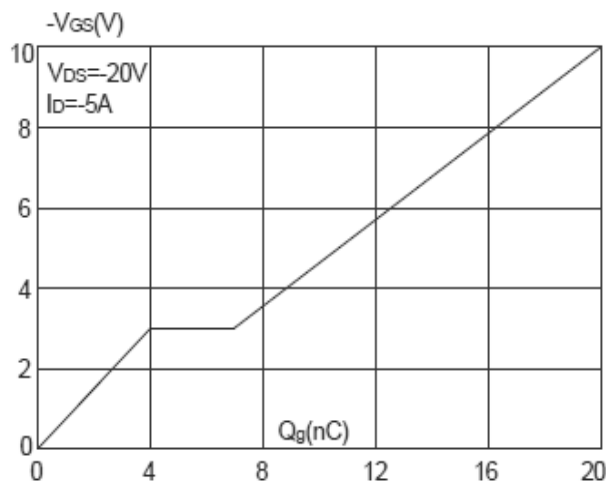
On-resistance vs. Drain Current



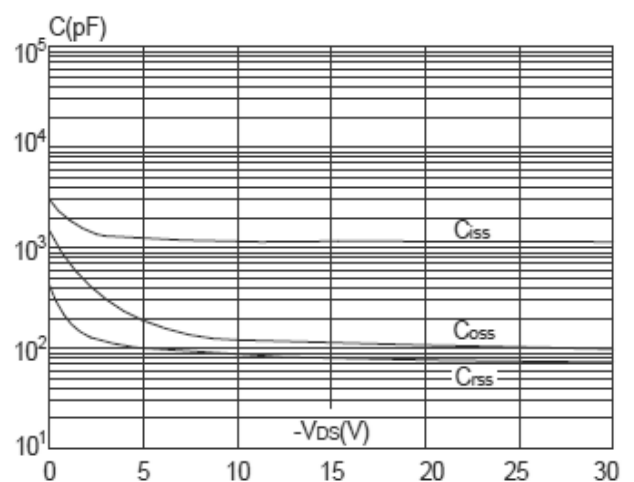
Body Diode Characteristics



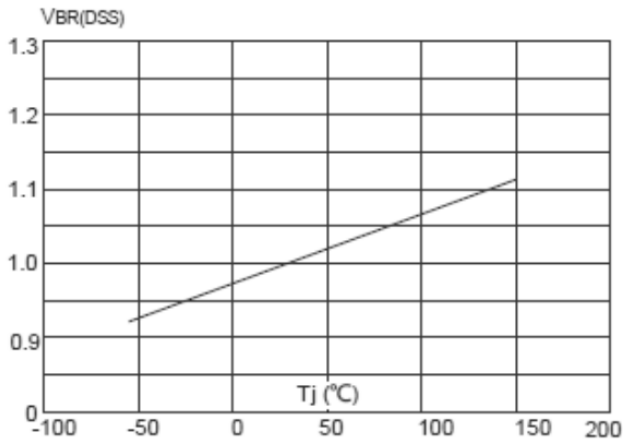
Gate Charge Characteristics



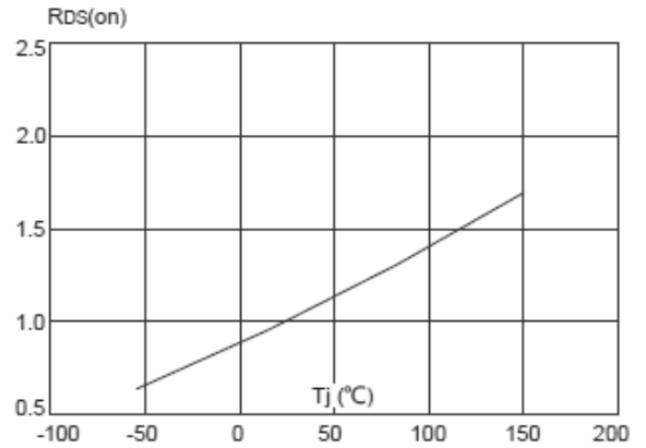
Capacitance Characteristics



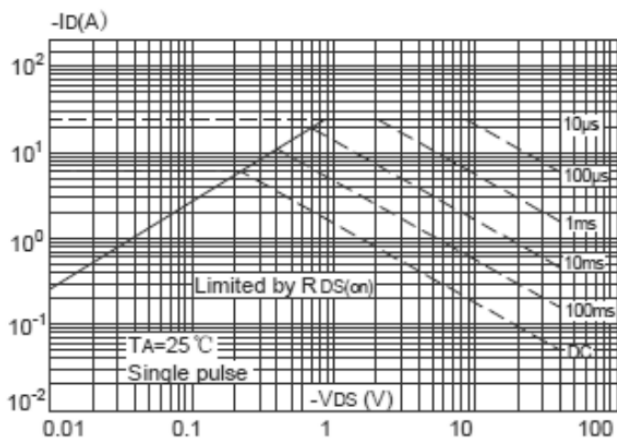
Normalized Breakdown Voltage vs. Junction Temperature



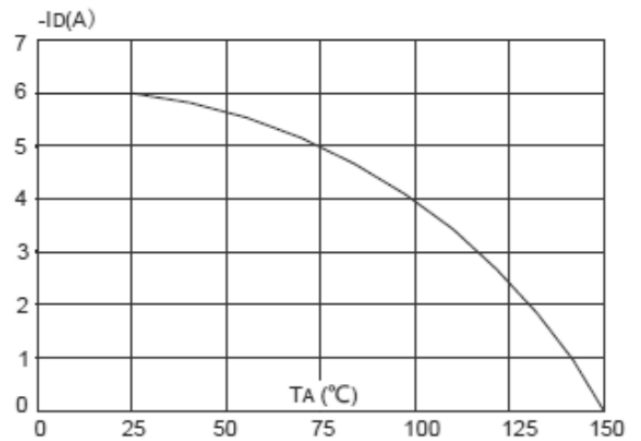
Normalized on Resistance vs. Junction Temperature



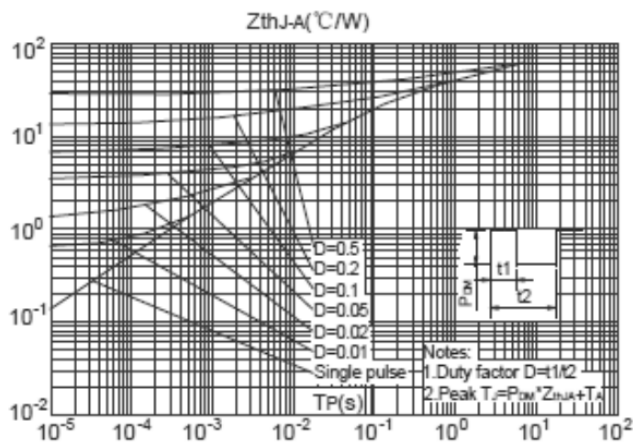
Maximum Safe Operating Area



Maximum Continuous Drain Current vs. Ambient Temperature

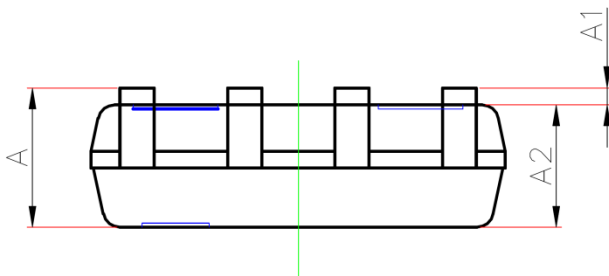
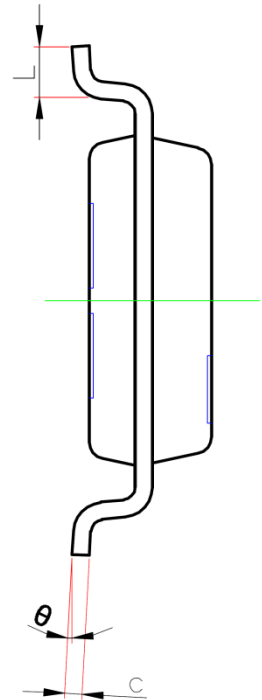
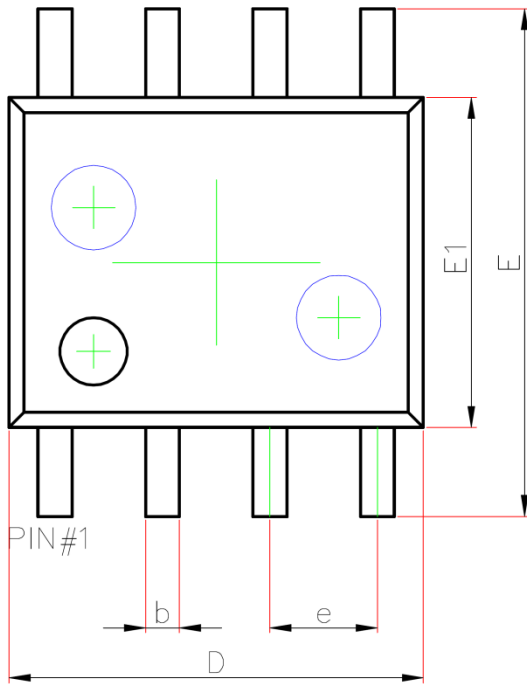


Maximum Effective Transient Thermal Impedance, Junction-to-Ambient





SOP-8L 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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