

General Description

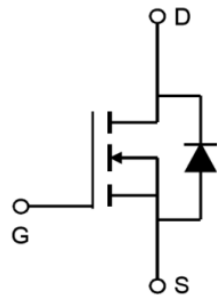
AP3400B combines advanced MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is most suitable to load-switch or PWM applications.

Applications

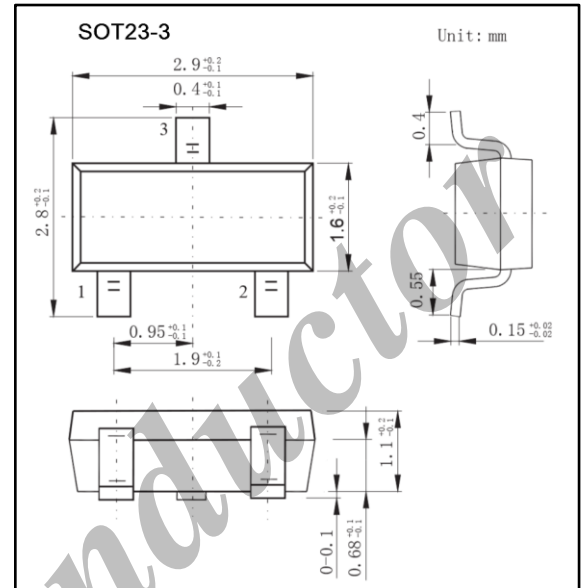
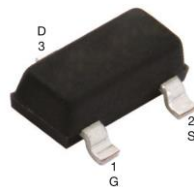
- DC/DC converter for portable devices
- Load switch

Product Summary

V_{DS}	30V
I_D (at $V_{GS} = 10V$)	5.8A
$R_{DS(ON)}$ (at $V_{GS} = 10V$)	< 28m Ω
$R_{DS(ON)}$ (at $V_{GS} = 4.5V$)	< 33m Ω
$R_{DS(ON)}$ (at $V_{GS} = 2.5V$)	< 52m Ω



Top View



Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current $T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	I_D	5.8	A
		4.9	
Pulsed Drain Current *	I_{DM}	30	
Power Dissipation $T_A = 25^\circ\text{C}$ $T_A = 70^\circ\text{C}$	P_D	1.4	W
		1	
Thermal Resistance. Junction- to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Thermal Resistance. Junction- to-Case	$R_{\theta JC}$	60	$^\circ\text{C/W}$
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

* Repetitive rating, pulse width limited by junction temperature.

• Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	$I_D=250\mu A$, $V_{GS}=0V$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V$, $V_{GS}=0V$			1	μA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_J=55^\circ C$			5	
Gate-Body leakage current	I_{GSS}	$V_{DS}=0V$, $V_{GS}=\pm 12V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	0.7	1.1	1.4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$, $I_D=5.8A$		22.8	28	m Ω
		$V_{GS}=10V$, $I_D=5.8A$ $T_J=125^\circ C$		32	39	
		$V_{GS}=4.5V$, $I_D=5A$		27.3	33	
		$V_{GS}=2.5V$, $I_D=4A$		43.3	52	
On state drain current	$I_{D(on)}$	$V_{GS}=4.5V$, $V_{DS}=5V$	30			A
Forward Transconductance	g_{FS}	$V_{DS}=5V$, $I_D=5A$	10	15		S
Input Capacitance	C_{iss}	$V_{GS}=0V$, $V_{DS}=15V$, $f=1MHz$		823	1050	pF
Output Capacitance	C_{oss}			99		pF
Reverse Transfer Capacitance	C_{rss}			77		pF
Gate Resistance	R_g	$V_{GS}=0V$, $V_{DS}=0V$, $f=1MHz$		1.4	3.6	Ω
Total Gate Charge	Q_g	$V_{GS}=4.5V$, $V_{DS}=15V$, $I_D=5.8A$		9.7	12	nC
Gate Source Charge	Q_{gs}			1.6		nC
Gate Drain Charge	Q_{gd}			3.1		nC
Turn-On Delay Time	$t_{D(on)}$	$V_{GS}=10V$, $V_{DS}=15V$, $R_L=2.7\Omega$, $R_{GEN}=3\Omega$		3.3	5	ns
Turn-On Rise Time	t_r			4.8	7	ns
Turn-Off Delay Time	$t_{D(off)}$			26.3	40	ns
Turn-Off Fall Time	t_f			4.1	6	ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F=5A$, $dI/dt=100A/\mu s$		16	20	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=5A$, $dI/dt=100A/\mu s$		8.9	12	nC
Maximum Body-Diode Continuous Current	I_S				2.5	A
Diode Forward Voltage	V_{SD}	$I_S=1A$, $V_{GS}=0V$		0.71	1	V

• Ordering Information

Ordering Part Number	Package	MOQ
AP3400B	SOT23-3	3,000 pcs / reel

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• Typical Characteristics

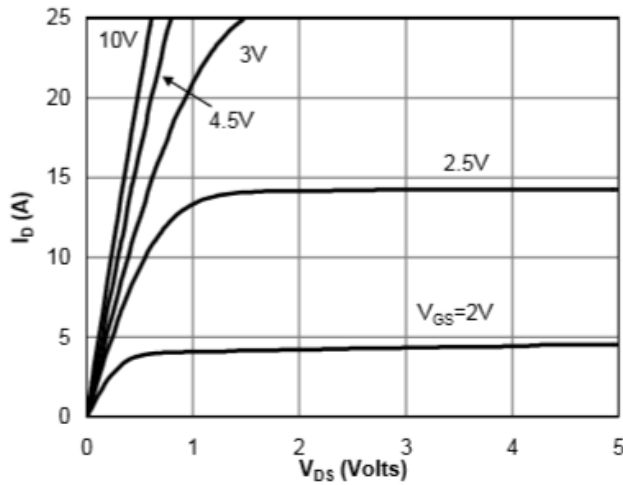


Fig 1: On-Region Characteristics

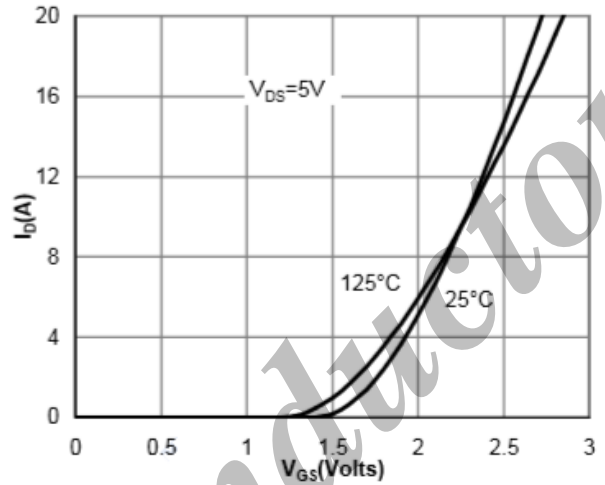


Figure 2: Transfer Characteristics

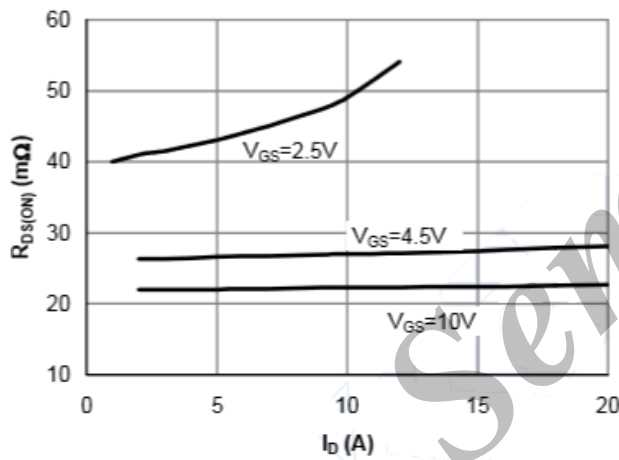


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

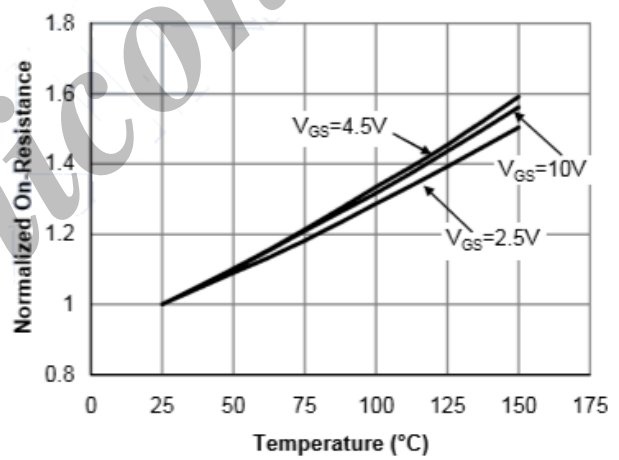


Figure 4: On-Resistance vs. Junction Temperature

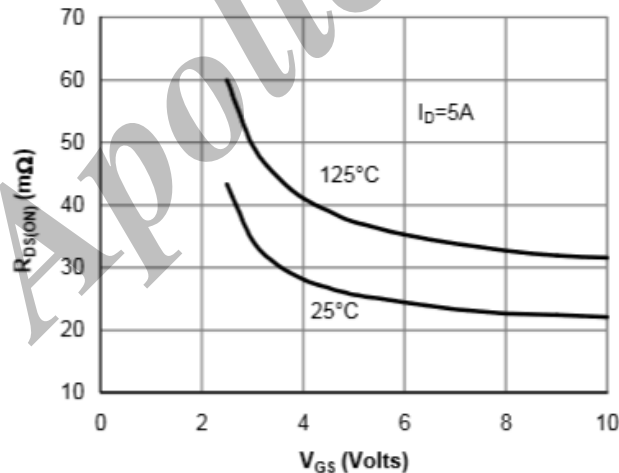


Figure 5: On-Resistance vs. Gate-Source Voltage

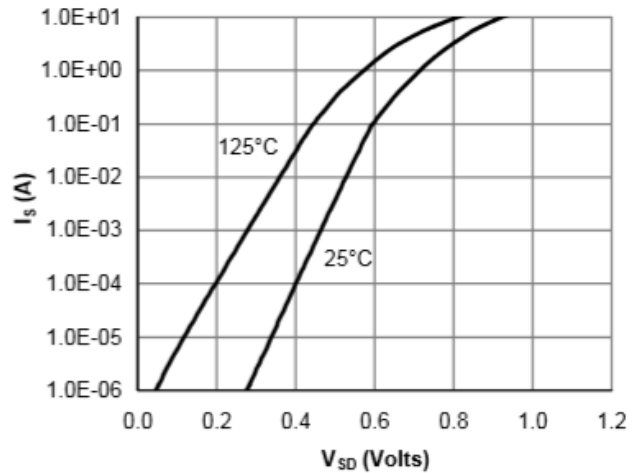


Figure 6: Body-Diode Characteristics

• Typical Characteristics

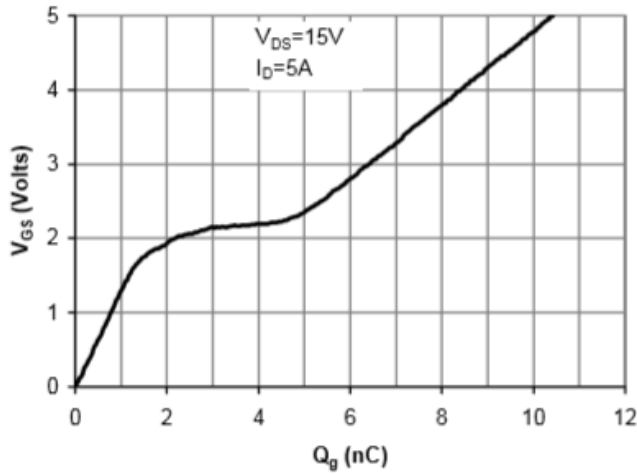


Figure 7: Gate-Charge Characteristics

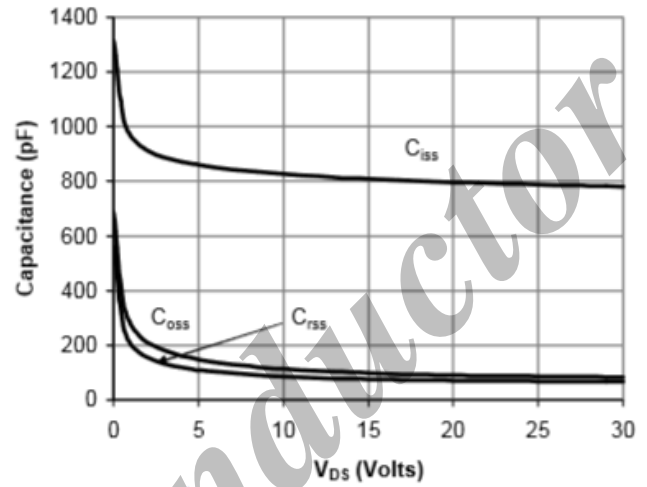


Figure 8: Capacitance Characteristics

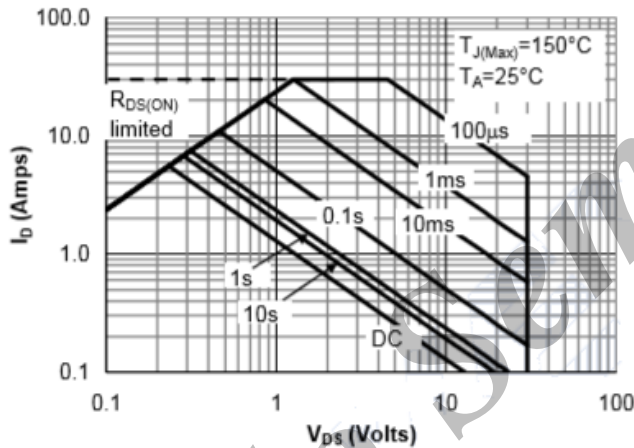


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

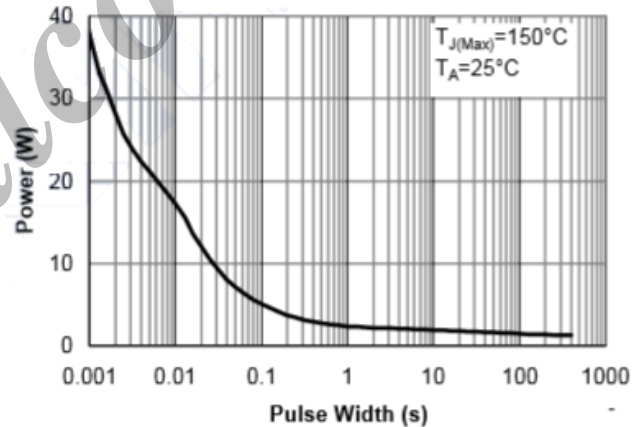


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

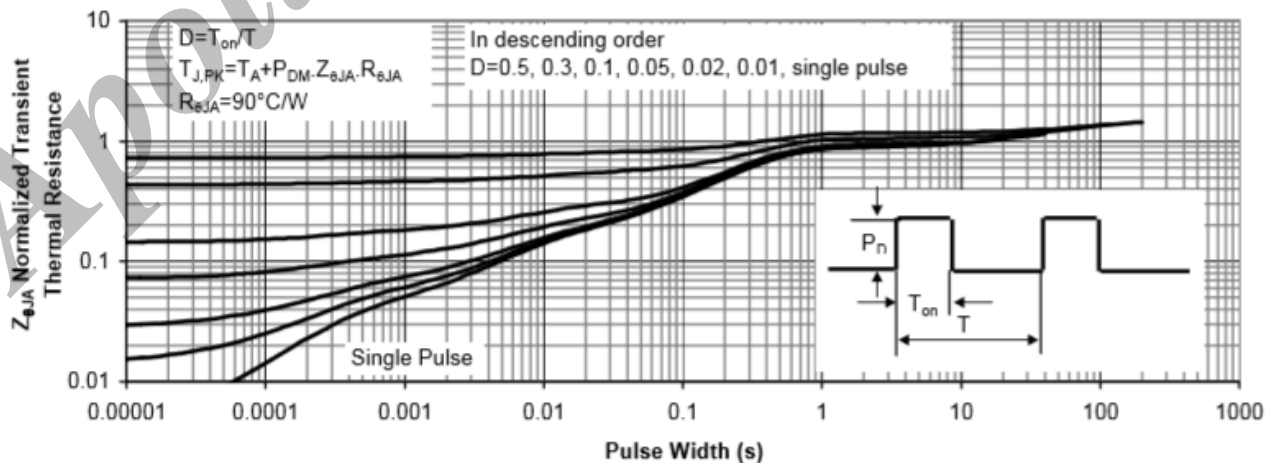


Figure 11: Normalized Maximum Transient Thermal Impedance

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