



ATP304

P-Channel Power MOSFET -60V, -100A, 6.5mΩ, ATPAK

ON Semiconductor®

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Features

- On-resistance $R_{DS(on)} = 5.0\text{m}\Omega$ (typ.)
- Input Capacitance $C_{iss} = 13000\text{pF}$ (typ.)
- 4.5V drive
- Halogen Free compliance

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Drain to Source Voltage	V_{DSS}		-60	V
Gate to Source Voltage	V_{GSS}		± 20	V
Drain Current (DC)	I_D		-100	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	-400	A
Allowable Power Dissipation	P_D	$T_c = 25^\circ\text{C}$	90	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *1	E_{AS}		656	mJ
Avalanche Current *2	I_{AV}		-75	A

Note : *1 $V_{DD} = -36\text{V}$, $L = 100\mu\text{H}$, $I_{AV} = -75\text{A}$

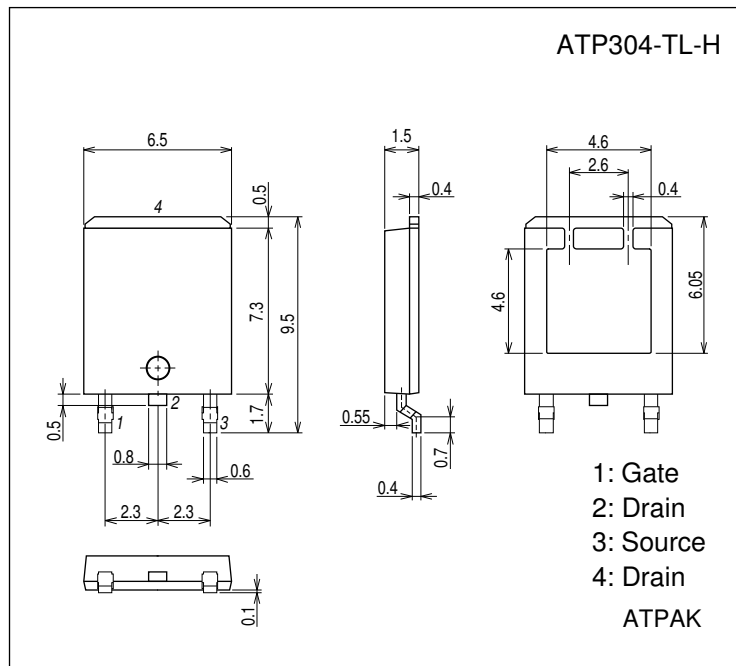
*2 $L \leq 100\mu\text{H}$, Single pulse

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

unit : mm (typ)

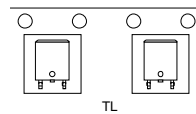
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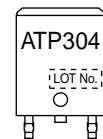
Ordering & Package Information

Device	Package	Shipping	note
ATP304-TL-H	ATPAK	3,000 pcs. / reel	Pb-Free and Halogen-Free

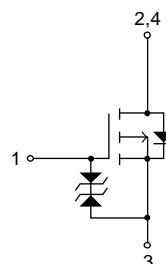
Packing Type: TL



Marking



Electrical Connection



ATP304

Electrical Characteristics at Ta = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = -1\text{mA}, V_{GS} = 0\text{V}$	-60			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -60\text{V}, V_{GS} = 0\text{V}$			-10	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 16\text{V}, V_{DS} = 0\text{V}$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = -10\text{V}, I_D = -1\text{mA}$	-1.2		-2.6	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = -10\text{V}, I_D = -50\text{A}$		100		S
Static Drain to Source On-State Resistance	$R_{DS(on)1}$	$I_D = -50\text{A}, V_{GS} = -10\text{V}$		5.0	6.5	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D = -50\text{A}, V_{GS} = -4.5\text{V}$		6.4	8.9	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS} = -20\text{V}, f = 1\text{MHz}$		13000		pF
Output Capacitance	C_{oss}			1080		pF
Reverse Transfer Capacitance	C_{rss}			760		pF
Turn-ON Delay Time	$t_{d(on)}$		See Fig.2		80	
Rise Time	t_r			650		ns
Turn-OFF Delay Time	$t_{d(off)}$			780		ns
Fall Time	t_f			460		ns
Total Gate Charge	Q_g	$V_{DS} = -36\text{V}, V_{GS} = -10\text{V}, I_D = -100\text{A}$			250	
Gate to Source Charge	Q_{gs}			55		nC
Gate to Drain "Miller" Charge	Q_{gd}			50		nC
Diode Forward Voltage	V_{SD}		$I_S = -100\text{A}, V_{GS} = 0\text{V}$		-1.0	-1.5
Reverse Recovery Time	t_{rr}	See Fig.3		90		ns
Reverse Recovery Charge	Q_{rr}	$I_S = -100\text{A}, V_{GS} = 0\text{V}, di/dt = -100\text{A}/\mu\text{s}$		245		nC

Fig.1 Unclamped Inductive Switching Test Circuit

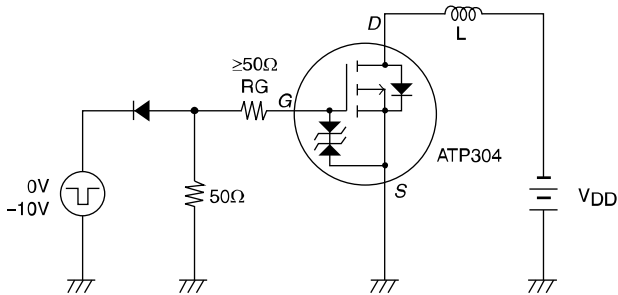


Fig.2 Switching Time Test Circuit

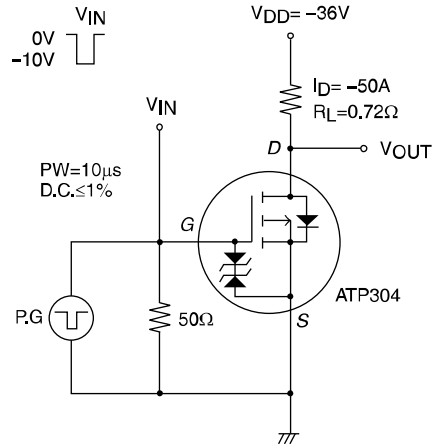
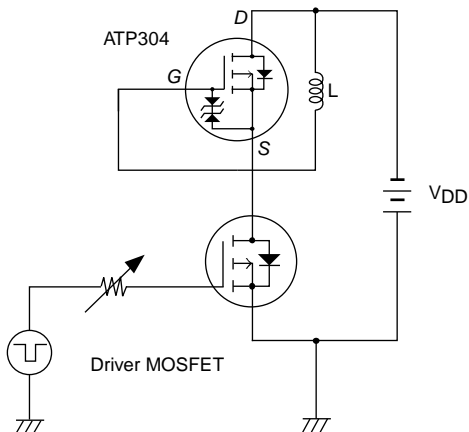
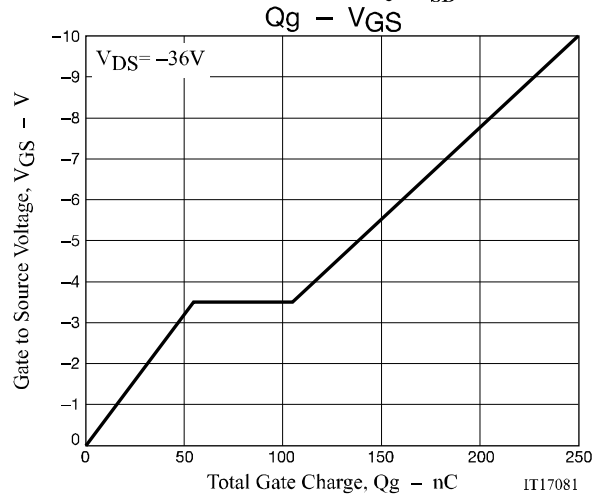
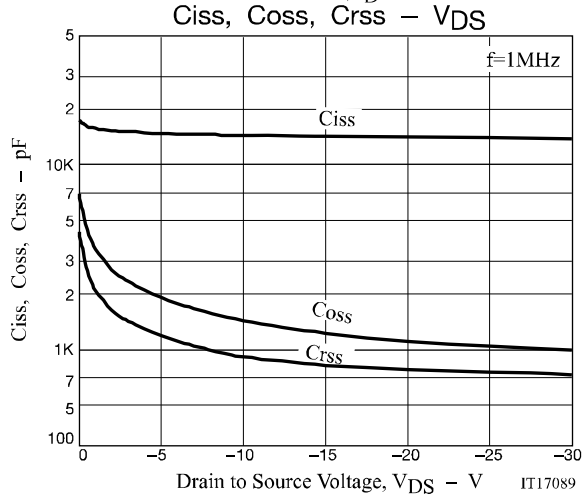
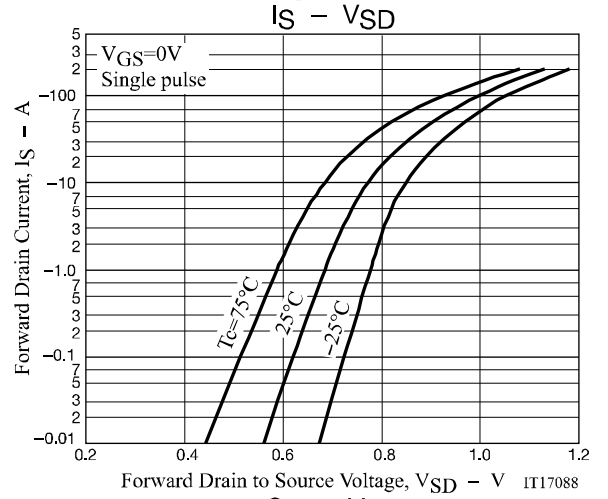
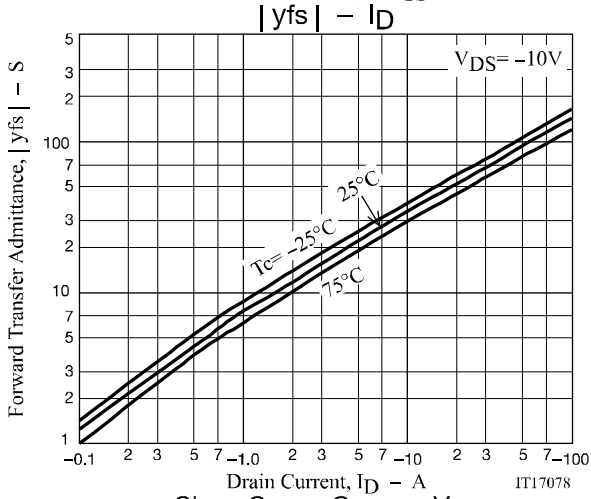
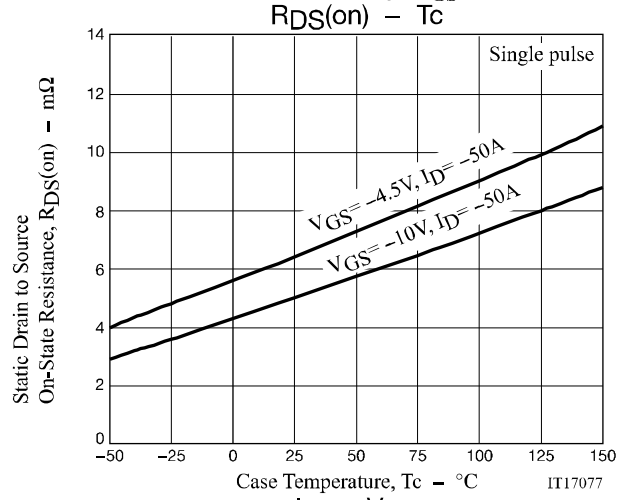
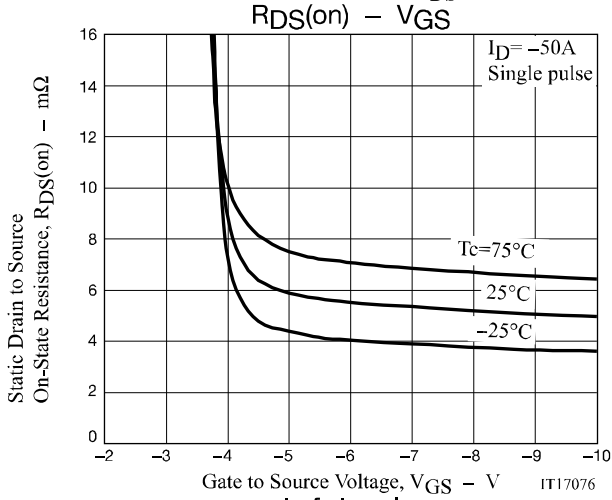
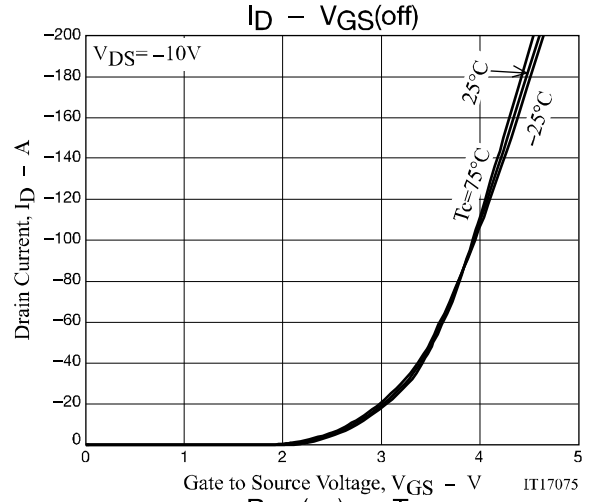
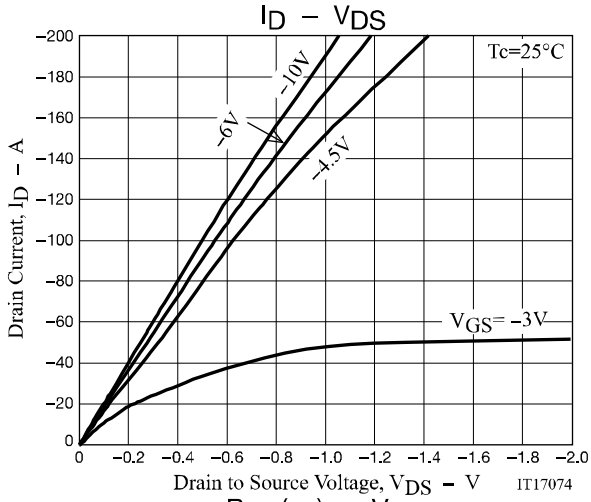
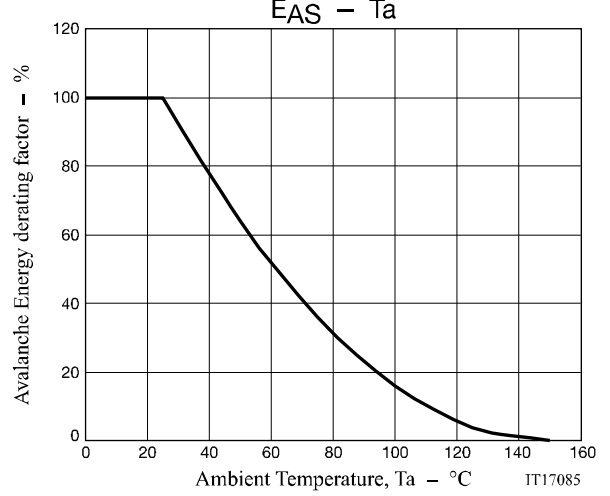
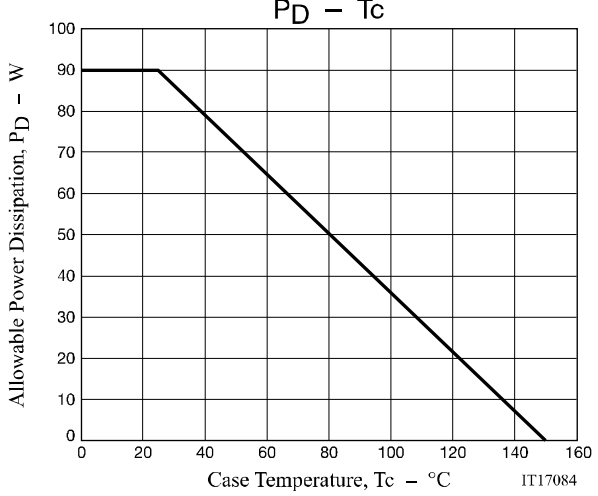
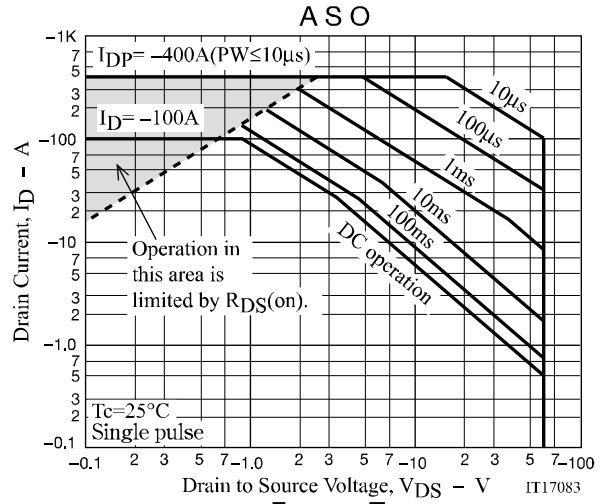
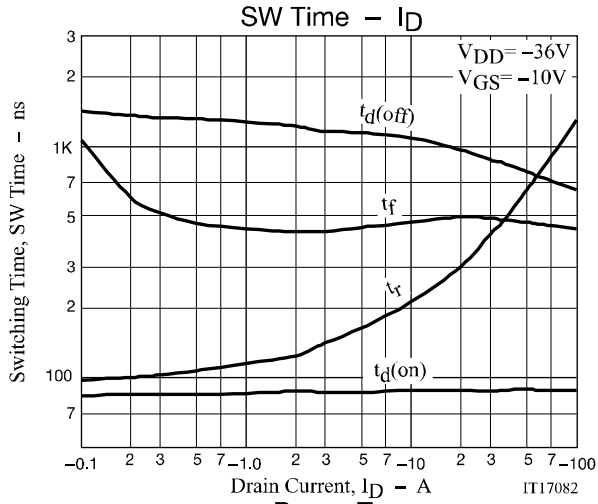


Fig.3 Reverse Recovery Time Test Circuit





ATP304



Note on usage : Since the ATP304 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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