

SuperMOS – SOT-23 -40V BV_{DSS} , 65m Ω $R_{DS(on)}$, P-channel MOSFET

1. Description

The AP40P05-ES is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product AP40P05-ES is Pb-free.

2. Features

- -40V, $R_{DS(ON)}$ =65m Ω (TYP.) @ V_{GS} =-10V
 $R_{DS(ON)}$ =85m Ω (TYP.) @ V_{GS} =-4.5V
- Fast Switching
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

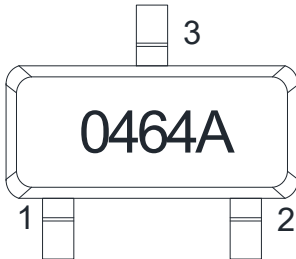
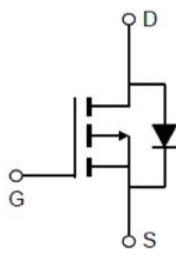
3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
AP40P05-ES	SOT-23	0464A	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7 inches

5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
1	Gate		
2	Source		
3	Drain		

6. Specification

Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		BV_{DSS}	-40	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_A = 25^\circ\text{C}$	I_D	-3.0	A
Continuous Drain Current	$T_A = 100^\circ\text{C}$		-1.9	A
Maximum Power Dissipation		P_D	1.3	W
Pulsed Drain Current		I_{DM}	-12.0	A
Operating Junction Temperature		T_J	-55 to +150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55 to +150	$^\circ\text{C}$

Thermal resistance ratings

Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ($t \leq 10\text{s}$)	$R_{\theta JA}$		95	$^\circ\text{C/W}$

AP40P05-ES

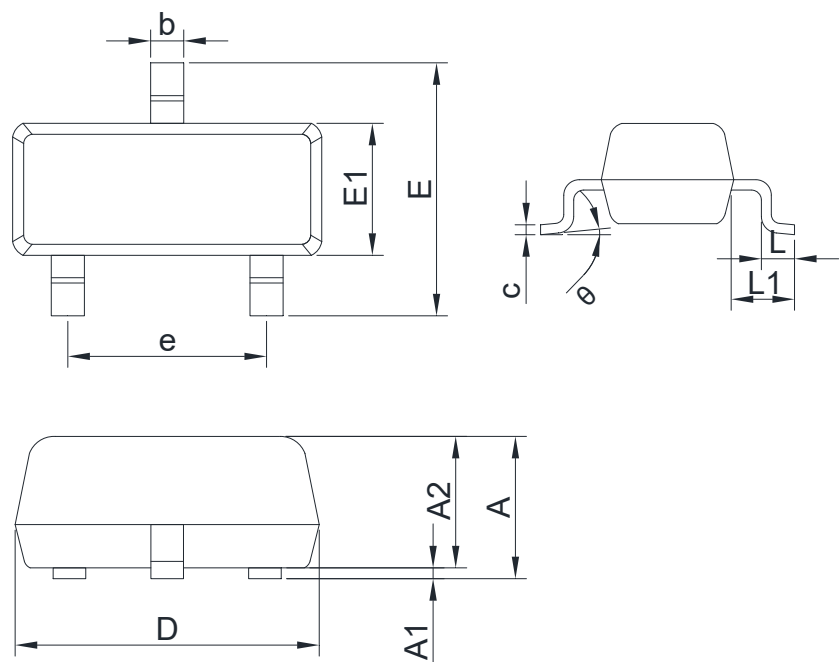
Rev-1.1

Electrical Characteristics

At TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-40V, V _{GS} =0V			-1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =-250uA	-1.1	-1.6	-2.2	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-1.2 A		65	85	mΩ
		V _{GS} =-4.5V, I _D =-1A		85	111	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-20V f=1MHz		316		pF
Output Capacitance	C _{OSS}			37		
Reverse Transfer Capacitance	C _{RSS}			31		
Total Gate Charge	Q _G	V _{GS} =0 to -10V, V _{DS} =-20V, I _D =-1.2A		8		nC
Gate-to-Source Charge	Q _{GS}			1.5		
Gate-to-Drain Charge	Q _{GD}			1.7		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{d(ON)}	V _{GS} =-10V, V _{DD} =-20V I _D =-1.2A, R _G =6Ω		6		ns
Rise Time	t _r			5		
Turn-Off Delay Time	t _{d(OFF)}			26		
Fall Time	t _f			15		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-1.5A			-1.2	V

7. Dimension (SOT-23)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER					
SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	0.90	1.20	E	2.25	2.55
A1	0.00	0.10	E1	1.20	1.40
A2	0.90	1.10	e	1.80	2.00
b	0.30	0.50	L	0.30	0.50
c	0.07	0.18	L1	0.475	0.625
D	2.80	3.04	θ	0°	8°

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