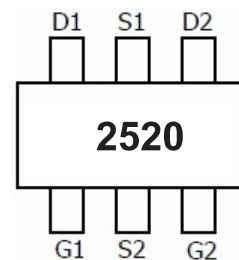
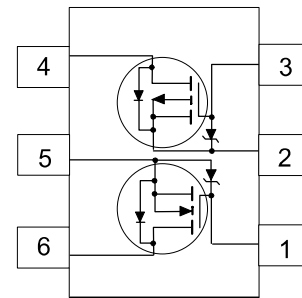


AP2520ES6

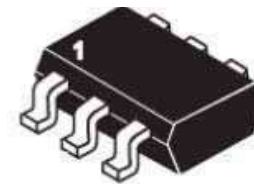
N and P-Channel Enhancement Mosfet

Feature

- N-Channel**
 $V_{DD}=20V, I_D=1.1A$
 $R_{DS(ON)} < 250m\Omega @ V_{GS}=4.5V$ TYP:120 m Ω
 $R_{DS(ON)} < 350m\Omega @ V_{GS}=2.5V$ TYP:160 m Ω
- P-Channel**
 $V_{DD}=-20V, I_D=-0.8A$
 $R_{DS(ON)} < 520m\Omega @ V_{GS}=-4.5V$ TYP:430 m Ω
 $R_{DS(ON)} < 700m\Omega @ V_{GS}=-2.5V$ TYP:624 m Ω
 $R_{DS(ON)} < 1200m\Omega @ V_{GS}=-1.8V$ TYP:950 m Ω
- Advanced Trench Technology
- Lead free product is acquired
- ESD Protected Up to 2.0KV(HBM)



Marking and pin Assignment



SOT-23-6L top view

Application

- Interfacing Switching
- Load Switching
- Logic Level shift

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
2520	AP2520ES6	SOT23-6	7 inch	-	3000

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ C$ unless otherwise noted)

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	± 12	± 12	V
Continuous Drain Current ($T_a = 25^\circ C$)	I_D	1.1	-0.8	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	5	-4	A
Power Dissipation	P_D	0.8	0.8	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	156	156	$^\circ C/W$
Junction Temperature	T_J	150	150	$^\circ C$
Storage Temperature	T_{STG}	-55~ +150	-55~ +150	$^\circ C$

N-CH ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	20	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 20V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±12V, V _{DS} = 0V	-	-	±2000	nA
Gate threshold voltage ⁽³⁾	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	0.35	0.75	1.1	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} = 4.5V, I _D = 0.5A	-	120	250	mΩ
		V _{GS} = 2.5V, I _D = 0.3A	-	160	350	
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} = 16V, V _{GS} = 0V, f = 1MHz	-	60	118	pF
Output Capacitance	C _{oss}		-	9	18	
Reverse Transfer Capacitance	C _{rss}		-	7.5	15	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} = 10V, I _D = 0.5A, V _{GS} = 4.5V, R _G = 10Ω	-	6.7	-	ns
Turn-on rise time	t _r		-	4.8	-	
Turn-off delay time	t _{d(off)}		-	17.3	-	
Turn-off fall time	t _f		-	7.4	-	
Total Gate Charge	Q _g	V _{DS} = 15V, I _D = 1A, V _{GS} = 4.5V	-	1.6	-	nC
Gate-Source Charge	Q _{gs}		-	0.2	-	
Gate-Drain Charge	Q _{gd}		-	0.2	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V _{DS}	V _{GS} = 0V, I _S = 0.3A	-	-	1.2	V
Diode Forward current ⁽⁴⁾	I _S		-	-	1.1	A

P-CH ELECTRICAL CHARACTERISTICS($T_a=25^{\circ}\text{C}$ unless otherwise noted)

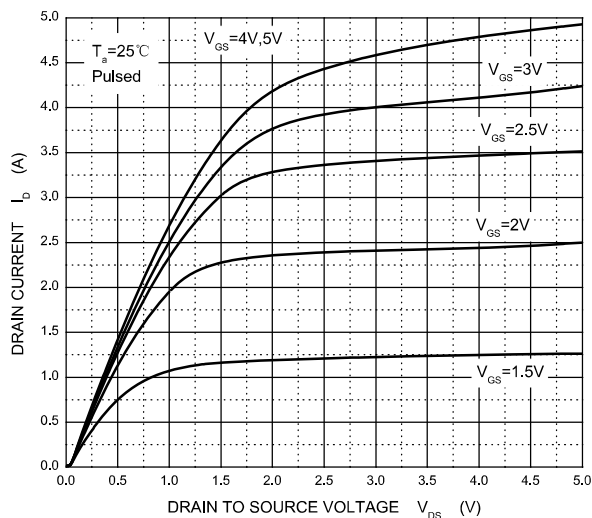
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$	-	-	-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 10V, V_{DS} = 0V$	-	-	± 20	μA
Gate threshold voltage ⁽³⁾	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.35	-0.45	-1.1	V
Drain-source on-resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -0.65A$	-	430	520	m Ω
		$V_{GS} = -2.5V, I_D = -0.55A$	-	624	700	
		$V_{GS} = -1.8V, I_D = -0.45A$		950	1200	
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -16V, V_{GS} = 0V, f = 1MHz$	-	113	-	pF
Output Capacitance	C_{oss}		-	15	-	
Reverse Transfer Capacitance	C_{rss}		-	9	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -10V, I_D = -0.5A,$ $V_{GS} = -4.5V, R_G = 10\Omega$	-	9	-	ns
Turn-on rise time	t_r		-	5.8	-	
Turn-off delay time	$t_{d(off)}$		-	32.7	-	
Turn-off fall time	t_f		-	20.3	-	
Total Gate Charge	Q_g	$V_{DS} = -15V, I_D = -1A,$ $V_{GS} = -4.5V$	-	1.8	-	nC
Gate-Source Charge	Q_{gs}		-	0.31	-	
Gate-Drain Charge	Q_{gd}		-	0.3	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V_{DS}	$V_{GS} = 0V, I_S = -0.5A$	-	-	-1.2	V
Diode Forward current ⁽⁴⁾	I_S		-	-	-0.8	A

Notes:

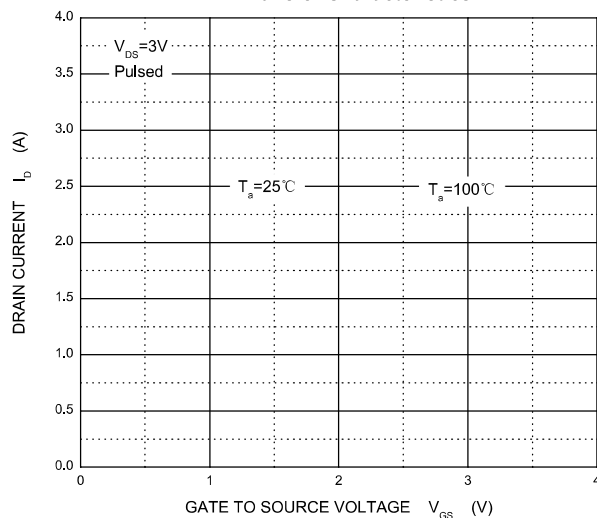
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. Surface Mounted on FR4 Board, $t \leq 10$ sec

Typical Characteristic N

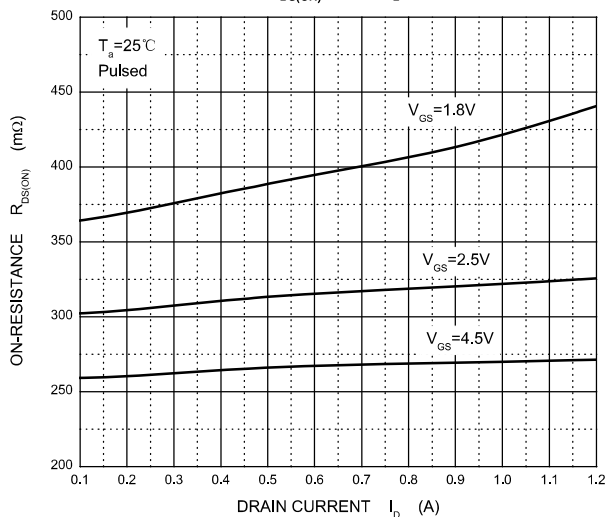
Output Characteristics



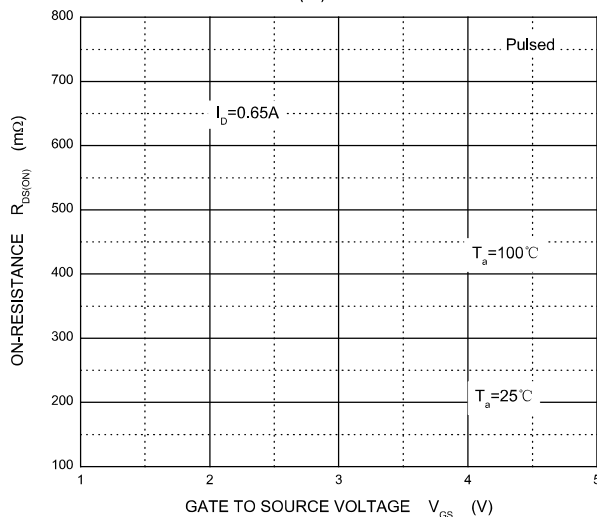
Transfer Characteristics



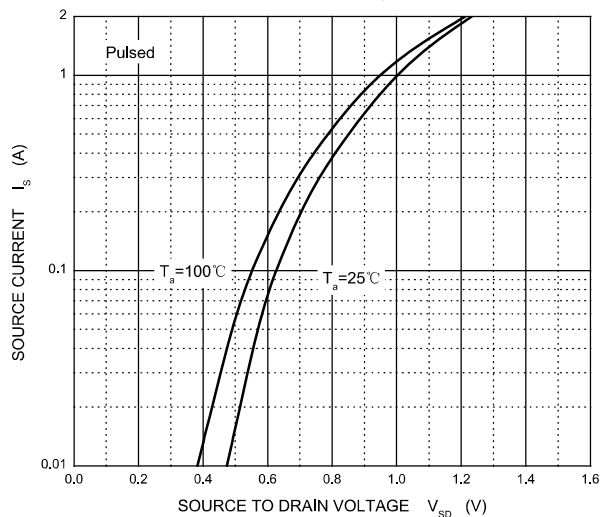
$R_{DS(ON)}$ — I_D



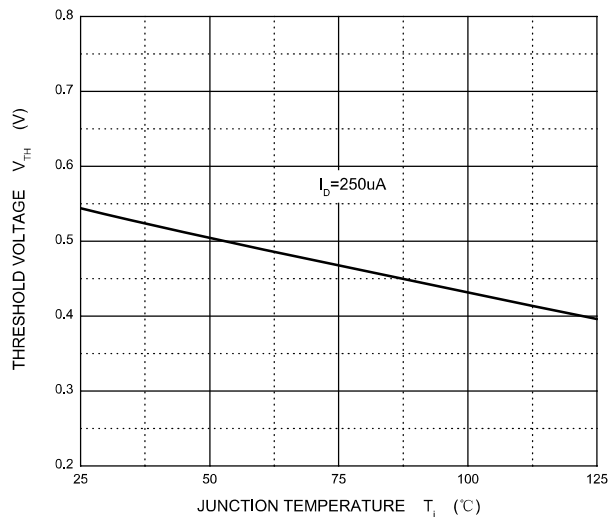
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}

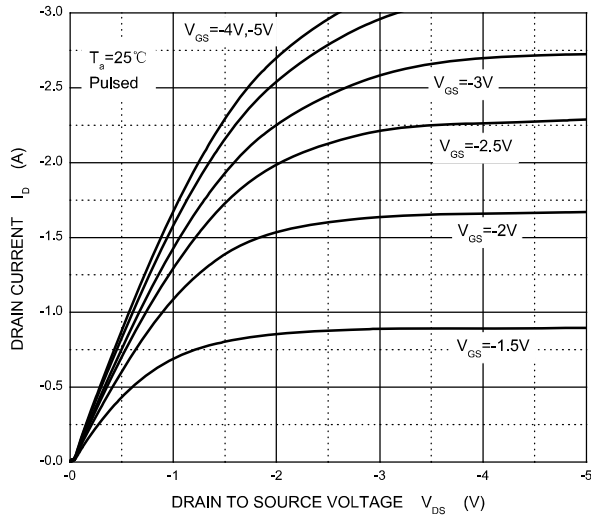


Threshold Voltage

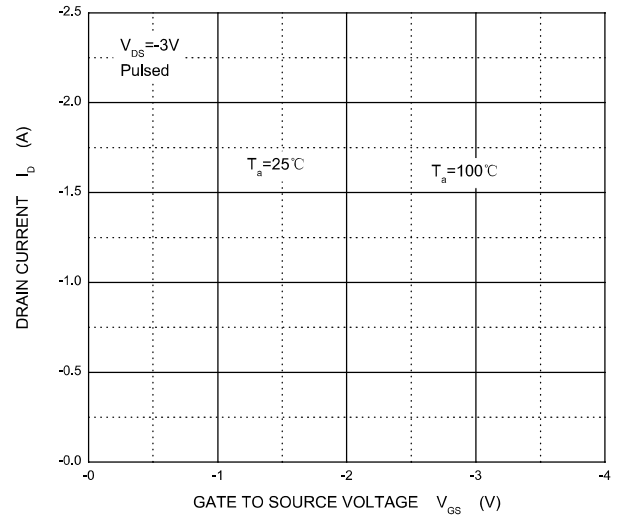


Typical Characteristics P

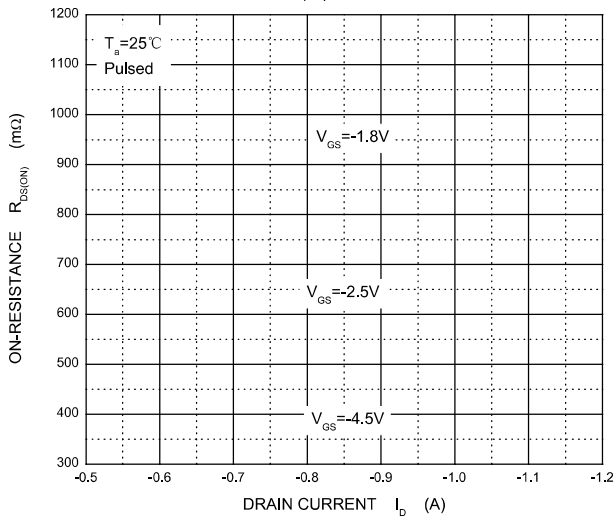
Output Characteristics



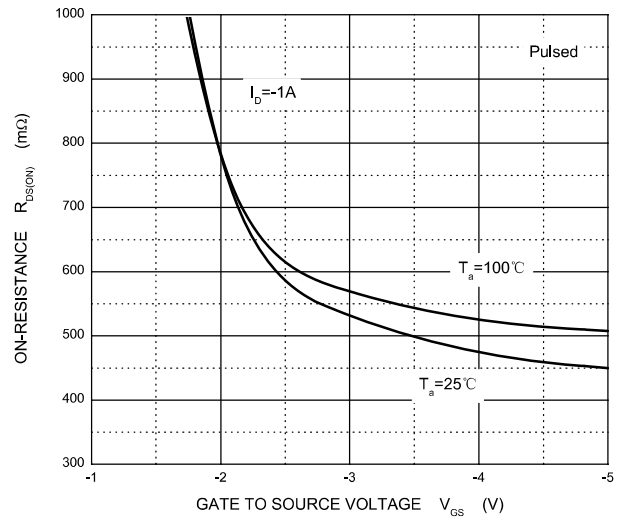
Transfer Characteristics



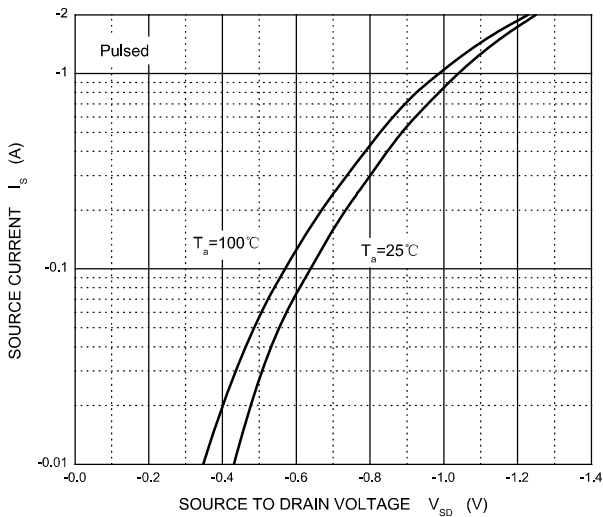
$R_{DS(ON)}$ — I_D



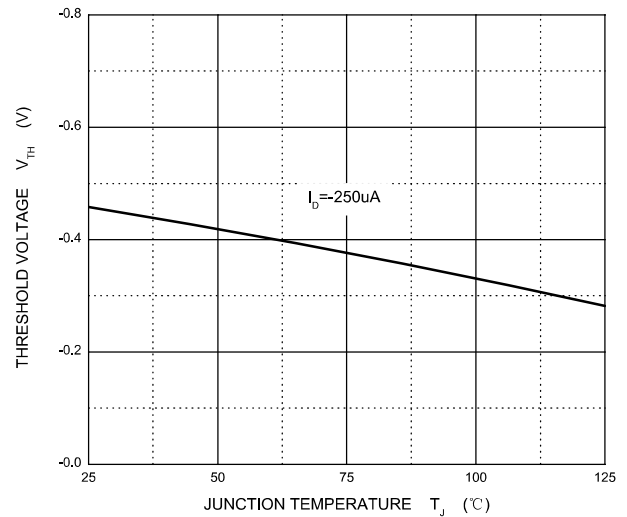
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



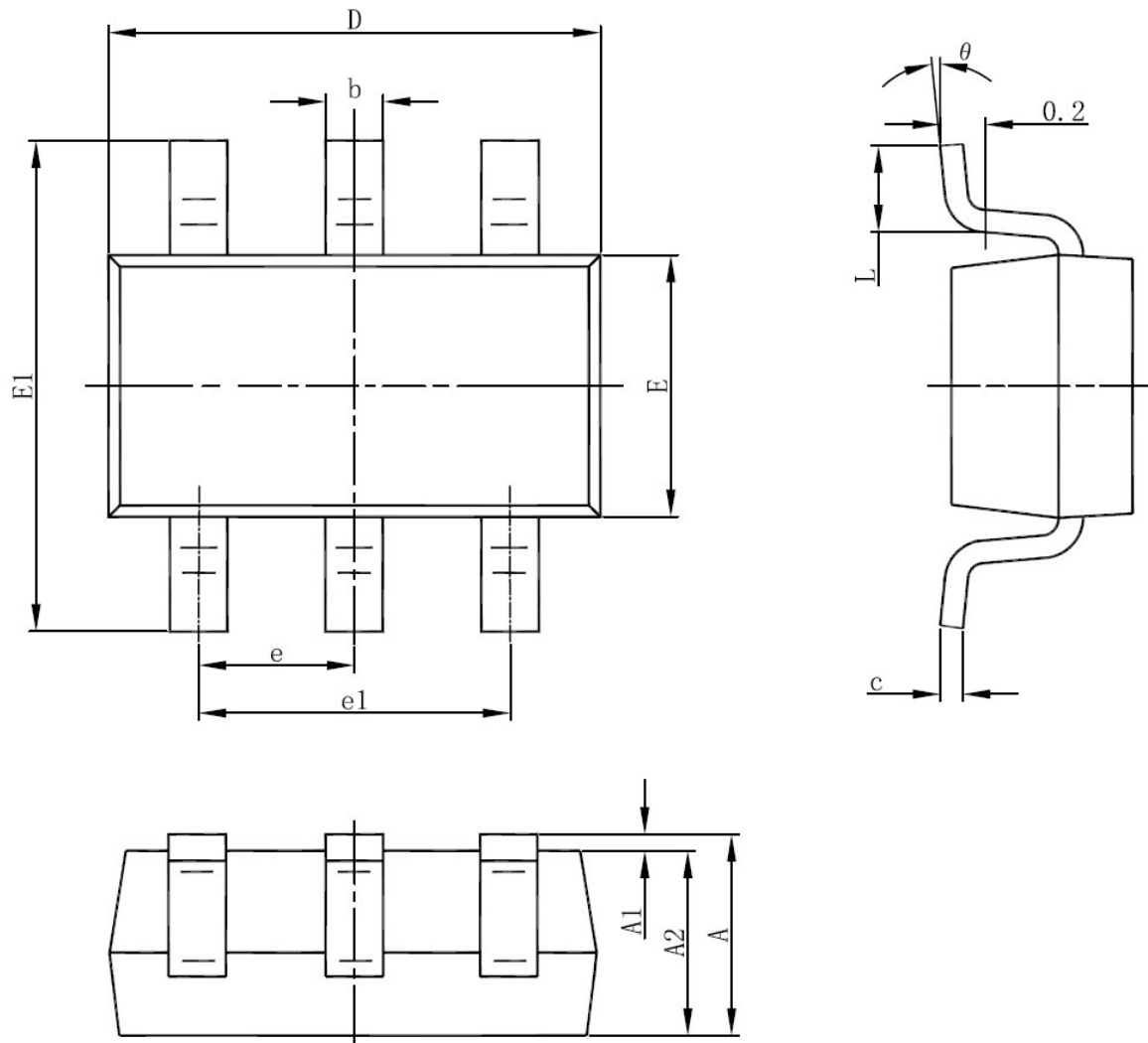
Threshold Voltage



AP2520ES6

N and P-Channel Enhancement Mosfet

SOT23-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°