20V P-Channel Enhancement Mode Power MOSFET

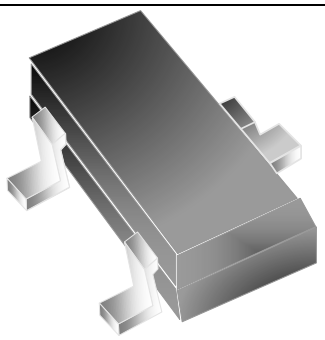
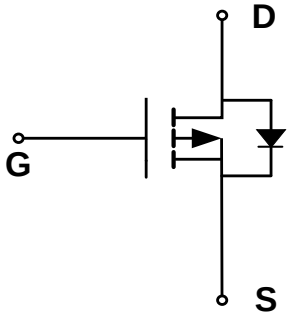
Features

- Small Signal MOSFETs
- V_{DS}= -20V, I_D = -2.6A
  $R_{DS(on)}$ < 65mΩ @ V_{GS} = -4.5V
  $R_{DS(on)}$ < 83mΩ @ V_{GS} = -2.5V
- Trench LV MOSFET Technology

Mechanical Characteristics

- SOT-23 Package
- Marking : Making Code
- RoHS Compliant & Halogen-Free

Schematic & PIN Configuration

 SOT-23	 Device symbol

Absolute Maximum Ratings (T_A = 25°C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current	T_A=25°C	I_D	-2.6	A
Pulsed Drain Current [1]		I_{DM}	-10	A
Total Power Dissipation	T_A=25°C	P_D	1	W
Operating Junction and Storage Temperature Range		T_J ,T_{STG}	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient [2]	$R_{\theta JA}$	125	°C/W

Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-20	-	-	V
Gate-Source Leakage Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±8V	-	-	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -20V, V_{GS} = 0V	-	-	-1	μA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-0.3	-0.6	-1	V
Drain-Source on-state Resistance (3)	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -2.6A	-	48	65	mΩ
		V_{GS} = -2.5V, I_D = -2A	-	59	83	
Dynamic Characteristics (4)						
Input Capacitance	C_{iss}	V_{DS} = -10V, V_{GS} = 0V, f = 1MHz	-	445	-	pF
Output Capacitance	C_{oss}		-	57	-	
Reverse Transfer Capacitance	C_{rss}		-	47	-	
Switching Characteristics (4)						
Total Gate Charge	Q_g	V_{GS} = -4.5V, V_{DS} = -10V, I_D= -2.6A	-	4.9	-	nC
Gate-Source Charge	Q_{gs}		-	0.4	-	
Gate-Drain Charge	Q_{gd}		-	0.8	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = -4.5V, V_{DD} = -10V, R_G = 1Ω, I_D= -2.6A	-	6	-	ns
Rise Time	t_r		-	16	-	
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	
Fall Time	t_f		-	10	-	
Drain-Source Body Diode Characteristics						
Body Forward Voltage (3)	V_{SD}	I_S = -1A, V_{GS} = 0V	-	-	-1.2	V
Continuous Source Current	I_S		-	-	-2.6	A

Note1：Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C

Note2：The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.

Note3：The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.

Note4：This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

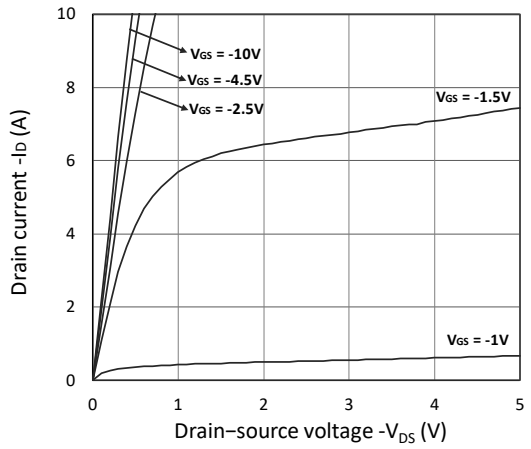


Figure 1. Output Characteristics

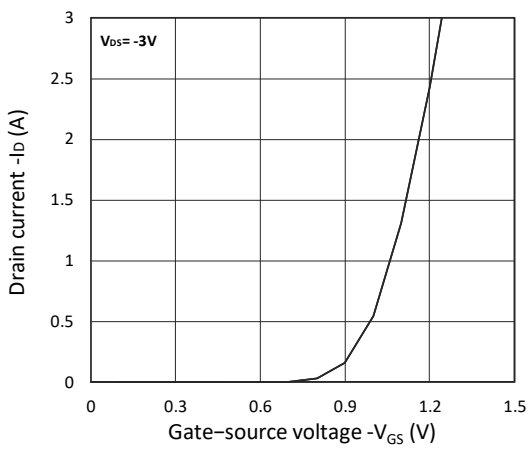


Figure 2. Transfer Characteristics

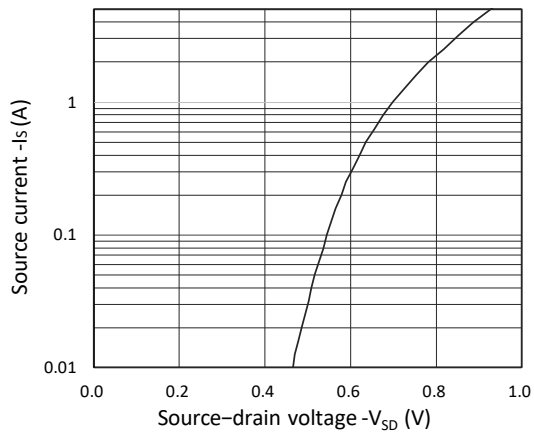


Figure 3. Forward Characteristics of Reverse

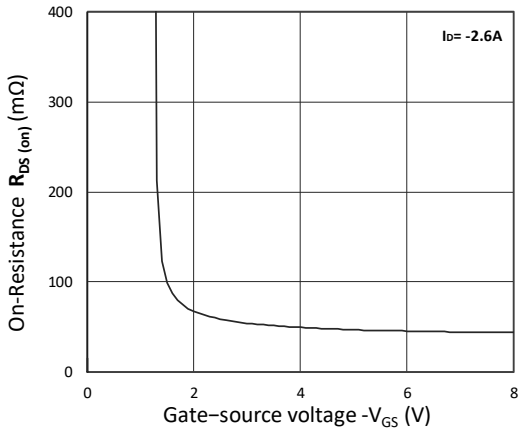


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

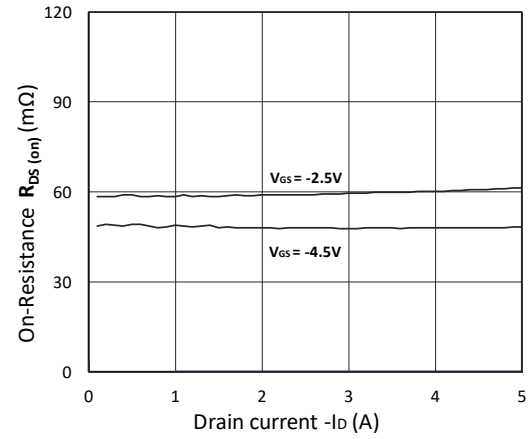


Figure 5. $R_{DS(ON)}$ vs. I_D

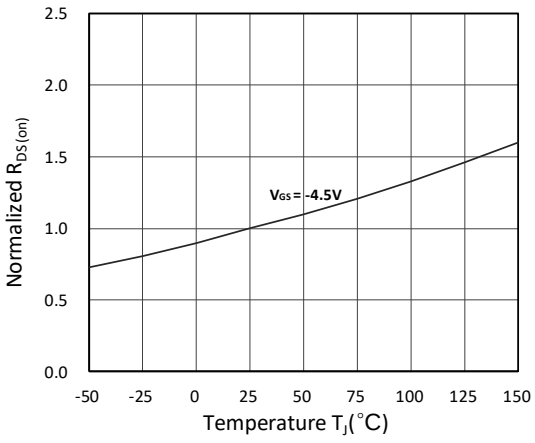


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

Typical Characteristics(Continued)

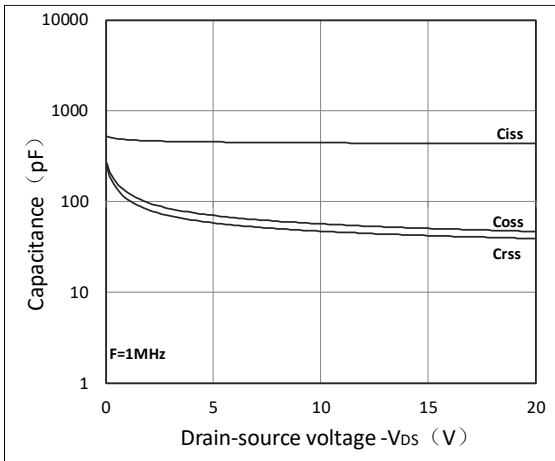


Figure 7. Capacitance Characteristics

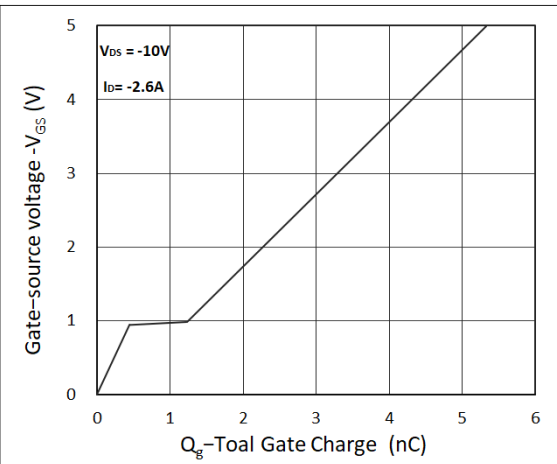
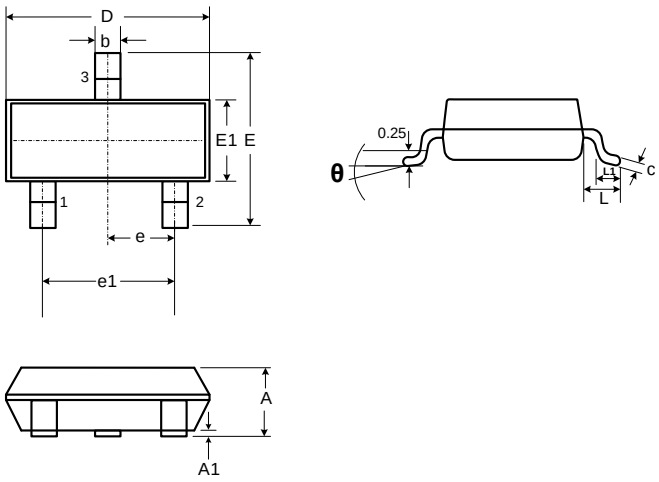


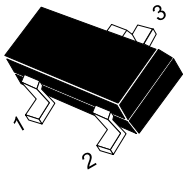
Figure 8. Gate Charge Characteristics

Package Dimension

SOT-23

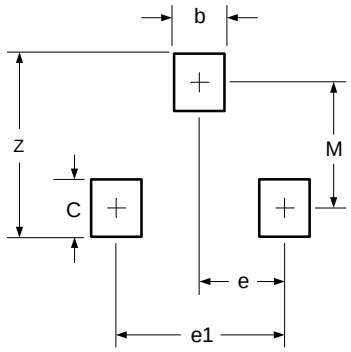
PACKAGE OUTLINE





SOT-23

DIMENSIONS				
SYMBOL	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
b	0.30	0.50	0.012	0.020
c	0.08	0.15	0.003	0.006
D	2.80	3.00	0.110	0.118
E	2.25	2.55	0.089	0.100
E1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.037 BSC	
e1	1.80	2.00	0.071	0.079
L	0.55 REF		0.022 REF	
L1	0.30	0.50	0.012	0.020
θ	0°	8°	0°	8°



DIMENSIONS		
SYMBOL	INCHES	MILLIMETER
M	0.080	2.02
C	0.032	0.80
Z	0.111	2.82
e	0.037 BSC	0.95 BSC
e1	0.075 BSC	1.90 BSC
b	0.032	0.80

Ordering Information

Part	Package	Marking	Packing method	MPQ
EM02P26M	SOT-23	2301B	Tape and Reel	3k/Reel

Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2023-05-16	Original Version	Pan Shun Ye	Qi Shu Kun	Liu Jia Ying