

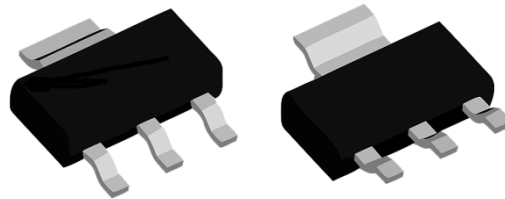
## Description

This P-channel MOSFETS use advanced trench technology and design to provide excellent RDS(on) with low gate charge. It can be used in a wide variety of applications.

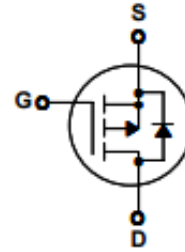
## Features

BVDSS	RDS(ON)	ID
-60V	0.3Ω	-1.9A

- 1) Low gate charge.
- 2) Green device available.
- 3) Advanced high cell density trench technology for ultra RDS(ON)
- 4) Excellent package for good heat dissipation.



SOT-223



## Absolute Maximum Ratings $T_c=25^{\circ}\text{C}$ , unless otherwise noted

Symbol	Parameter	Ratings	Units
VDS	Drain-Source Voltage	60	V
VGS	Gate-Source Voltage	±20	V
ID	Continuous Drain Current-1	-1.9	A
	Continuous Drain Current-T=100°C	-1.5	
	Pulsed Drain Current <sup>2</sup>	—	
EAS	Single Pulse Avalanche Energy <sup>3</sup>	70	mJ
PD	Power Dissipation <sup>4</sup>	1.8	W
TJ, TSTG	Operating and Storage Junction Temperature Range	-55 to +150	°C

## Thermal Characteristics

Symbol	Parameter	Ratings	Units
R <sub>θJC</sub>	Thermal Resistance, Junction to Case <sup>1</sup>	—	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient <sup>1</sup>	—	

## Package Marking and Ordering Information

Part NO.	Marking	Package
KSMT170P	KSMT170P	SOT-223

## Electrical Characteristics $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{DS}=0V, I_D=250\mu A$	60	—	—	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=0V, V_{GS}=32V$	—	-0.1	-1	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{DS}=\pm 20V, V_{GS}=0A$	—	-10	-100	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{DS}=V_{DS}, I_D=250\mu A$	—	—	—	V
$R_{DS(ON)}$	Drain-Source On Resistance <sup>2</sup>	$V_{DS}=10V, I_D=6A$	—	0.1	0.3	$\Omega$
		$V_{DS}=2.5V, I_D=5A$	—	—	—	
$G_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=12A$	1	2.5	—	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V,$ $f=1MHz$	—	335	420	pF
$C_{oss}$	Output Capacitance		—	105	135	
$C_{rss}$	Reverse Transfer Capacitance		—	65	85	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=20V,$ $V_{GS}=10V, R_{GEN}=3.3\Omega$	—	14	21	ns
$t_r$	Rise Time		—	30	45	ns
$t_{d(off)}$	Turn-Off Delay Time		—	125	190	ns
$t_f$	Fall Time		—	65	100	ns
$Q_g$	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=20V,$ $I_D=6A$	—	0.3	0.54	nC
$Q_{gs}$	Gate-Source Charge		—	6	—	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		—	7.8	11.7	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=1A$	—	3.8	—	V
$t_{rr}$	Reverse Recovery Time	$I_F=7A, di/dt=100A/\mu S$	—	—	—	ns
$Q_{rr}$	Reverse Recovery Charge		—	—	—	nC

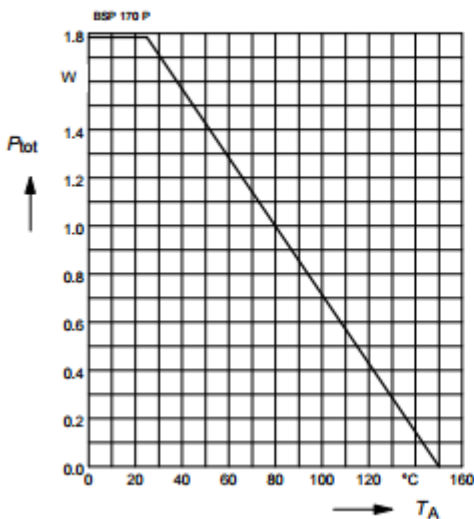
**Notes:**

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board 2OZ copper.
2. The data tested by pulse width≤300us,duty cycle≤2%
3. The EAS data shows Max. rating. The test condition is  $V_{DD}=25V, V_{GS}=10V, L=0.1mH, i_{AS}=17.8A$
4. The power dissipation is limited by 150°C junction temperature.

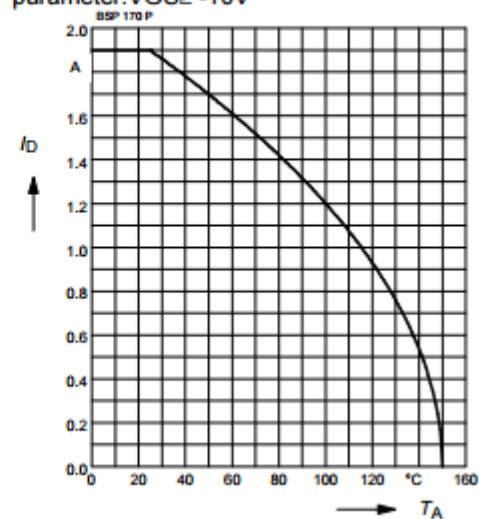
**Typical Characteristics**  $T_J=25^{\circ}C$  unless otherwise noted

**Power Dissipation**

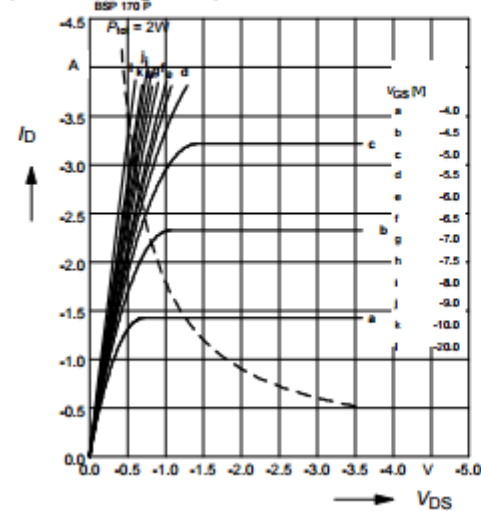
$$P_{tot} = f(T_A)$$


**Drain current**

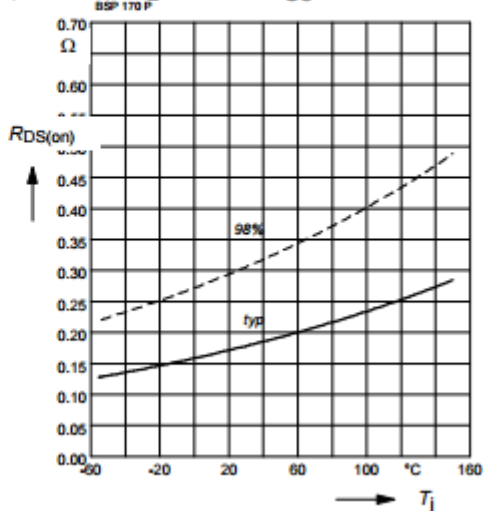
$$I_D = f(T_A)$$

 parameter:  $V_{GS} \geq -10V$ 

**Typ. output characteristics**

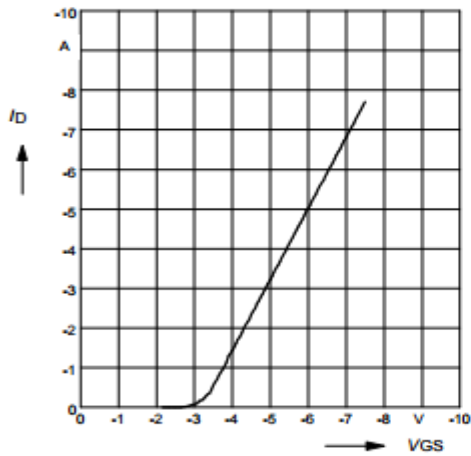
$$I_D = f(V_{DS})$$

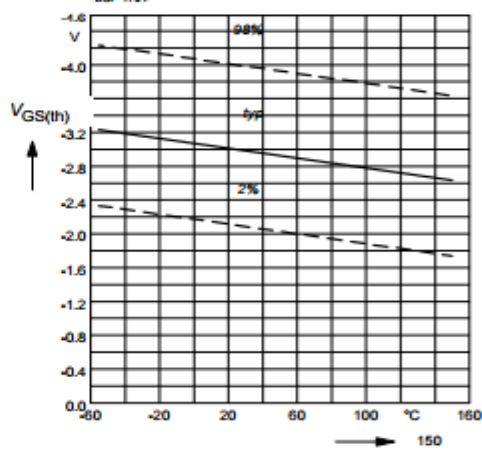
 parameter:  $t_D = 80 \mu s$ 

**Drain-source on-resistance**

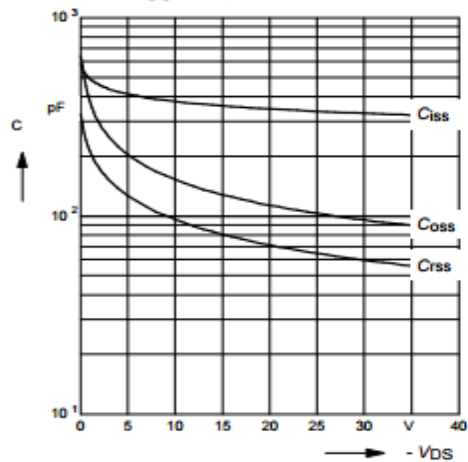
$$R_{DS(on)} = f(T_J)$$

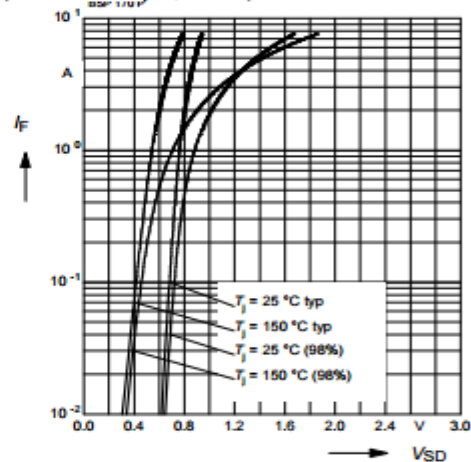
 parameter:  $I_D = -1.9 A, V_{GS} = -10 V$ 


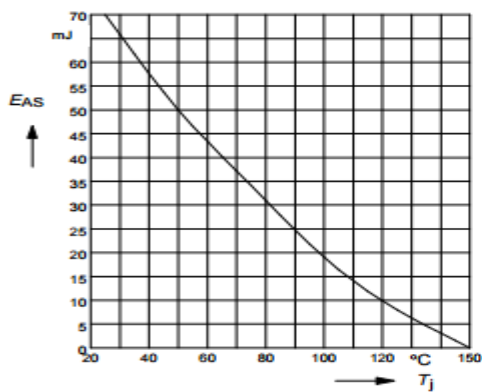
**Typ. transfer characteristics  $I_D = f(V_{GS})$** 

 parameter:  $t_p = 80 \mu s$ 
 $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$ 

**Gate threshold voltage**
 $V_{GS(th)} = f(T_j)$ 

 parameter:  $V_{GS} = V_{DS}, I_D = -460 \mu A$ 

**Typ. capacitances**
 $C = f(V_{DS})$ 

 Parameter:  $V_{GS} = 0 V, f = 1 MHz$ 

**Forward characteristics of reverse diode**
 $I_F = f(V_{SD})$ 

 parameter:  $T_j, t_p = 80 \mu s$ 

**Avalanche Energy  $E_{AS} = f(T_j)$** 

 parameter:  $I_D = -1.9 A, V_{DD} = -25 V$ 
 $R_{GS} = 25 \Omega$ 

**Typ. gate charge**
 $V_{GS} = f(Q_{Gate})$ 

 parameter:  $I_D \text{ ouls} = -1.9A$ 
