

N-Channel MOSFET

Features

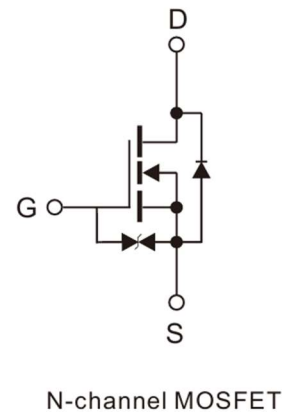
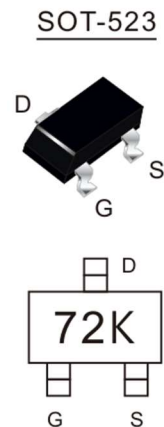
- Trench Power MV MOSFET Technology
- Voltage Controlled Small Signal Switch
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate

Product Summary		
V_{DS}	$R_{DS(on)}$ (Ω) Typ	I_D (mA)
60V	1.1@ 4.5V 0.2A	340
	0.9@ 10V 0.5A	

Application

- Load Switch for Portable Devices
- Solid-state relays

Marking information



Absolute Maximum Ratings (at $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage ($T_A=25^\circ\text{C}$)	V_{GS}	± 20	V
Continuous drain current ($T_A=25^\circ\text{C}$)	I_D	0.34	A
Peak Drain Current, Pulsed ¹⁾	I_{DM}	0.8	A
Power Dissipation	P_D	0.15	W
Operating Junction	T_J	-55~150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55~150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	425	$^\circ\text{C/W}$

Characteristics at T_J = 25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at V _{GS} =0V, I _D =250μA	BV _{DSS}	60			V
Drain-Source Leakage Current at V _{DS} =48V, V _{GS} =0V	I _{DSS}			1	μA
Gate Leakage Current at V _{GS} =±20V, V _{DS} =0V	I _{GSS}			±10	μA
Gate-Source Threshold Voltage at V _{DS} =V _{GS} , I _D =1mA	V _{GS(th)}	1	1.3	2.5	V
Drain-Source On-State Resistance at V _{GS} =10V, I _D =500mA at V _{GS} =4.5V, I _D =200mA	R _{DS(on)}		0.9 1.1	2.7 3.0	Ω
DYNAMIC PARAMETERS					
Input Capacitance at V _{DS} =10V, V _{GS} =0V, f=1MHz	C _{iss}			40	pF
Output Capacitance at V _{DS} =10V, V _{GS} =0V, f=1MHz	C _{oss}			30	pF
Reverse Transfer Capacitance at V _{DS} =10V, V _{GS} =0V, f=1MHz	C _{rss}			10	pF
Gate charge total at V _{DS} =30V, V _{GS} =10V, I _D =0.3A	Q _g		1.65		nc
Gate to Source Charge at V _{DS} =30V, V _{GS} =10V, I _D =0.3A	Q _{gs}		10.4		nc
Gate to Drain Charge at V _{DS} =30V, V _{GS} =10V, I _D =0.3A	Q _{gd}		0.24		nc
Turn-On Delay Time at V _{DD} =50V, R _L =250Ω, R _{GEN} =50Ω, V _{GS} =10V	t _{d(on)}			10	nS
Turn-Off Delay Time at V _{DD} =50V, R _L =250Ω, R _{GEN} =50Ω, V _{GS} =10V	t _{d(off)}			15	nS
Reverse Recovery Time at V _R =25V, V _{GS} =0V I _S =0.3A, di/dt=100A/μs	trr		30		nS
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at I _S =0.3A, V _{GS} =0V	V _{SD}			1.5	V
Maximum Body-Diode Continuous Current	I _S			200	mA

Note:

1) Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

Electrical Characteristics Curves

Figure 1. Output Characteristics

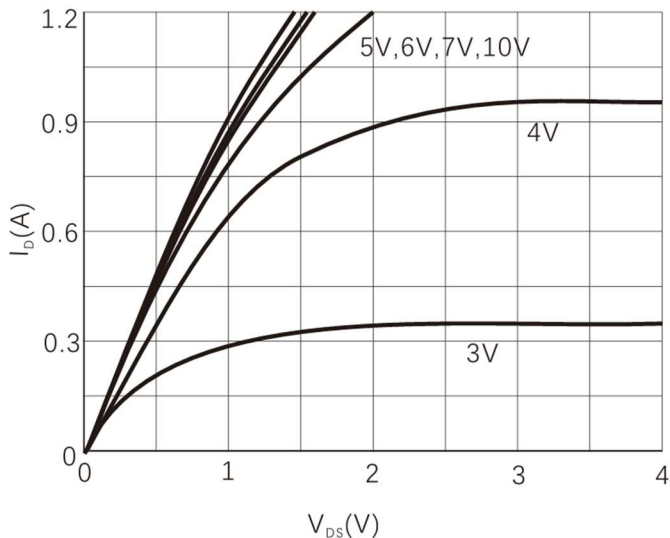


Figure 2. Transfer Characteristics

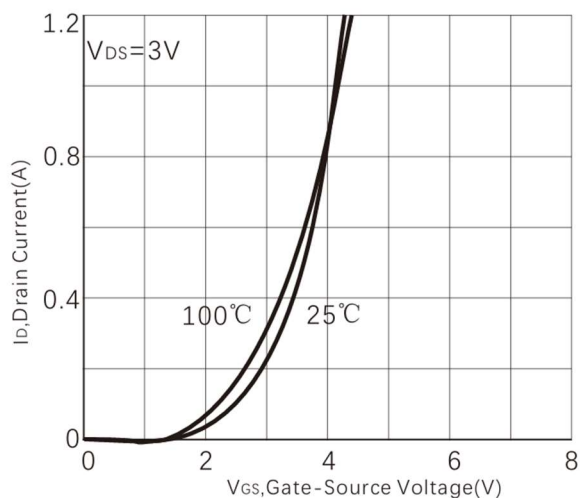


Figure 3. On-Resistance vs. Drain Current

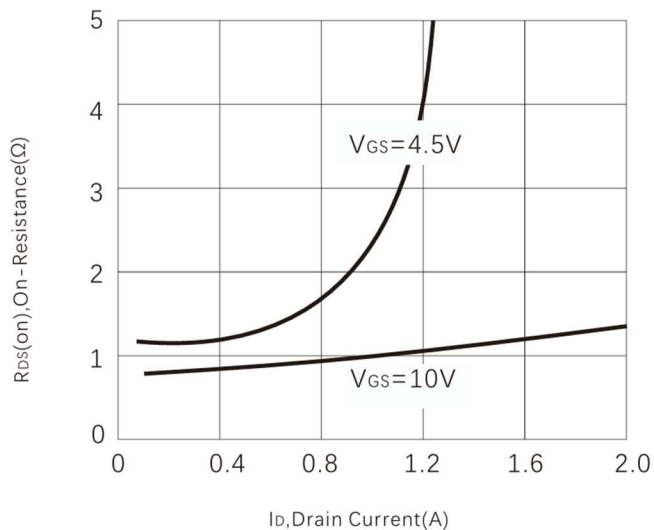


Figure 4. Capacitance

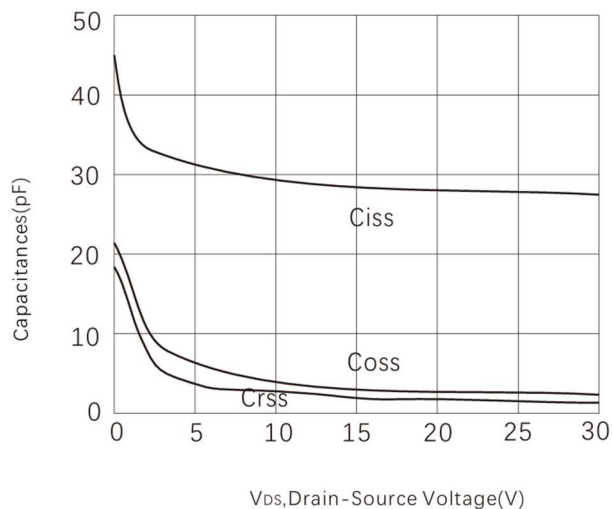


Figure 5. Gate charge

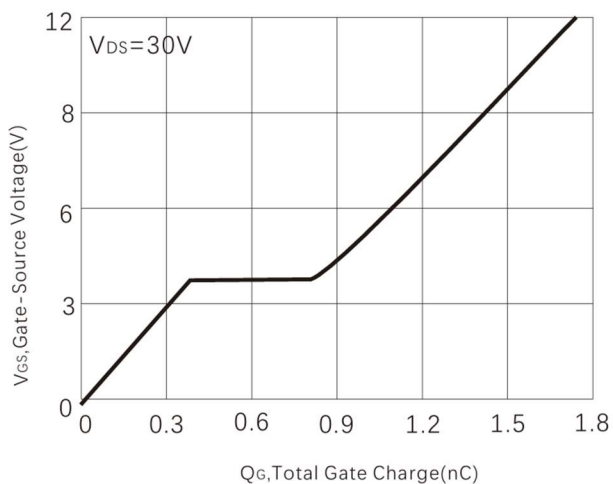


Figure 6. Normalized $R_{DS(ON)}$ vs Junction Temperature

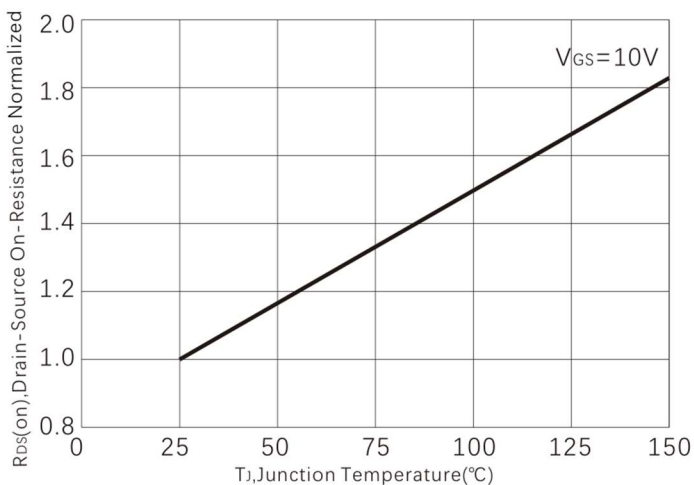
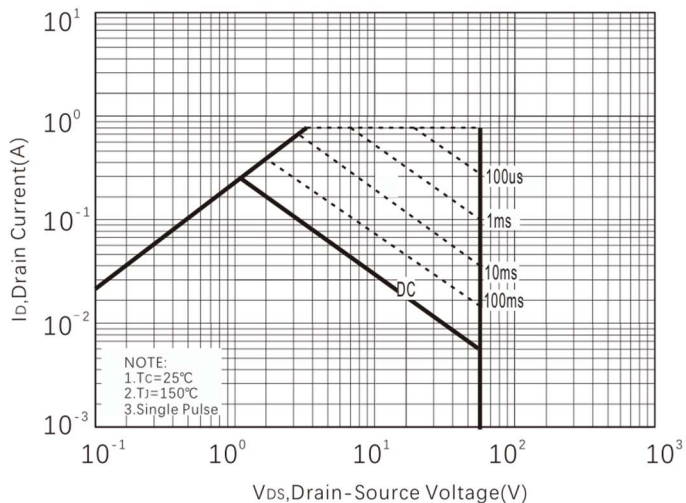
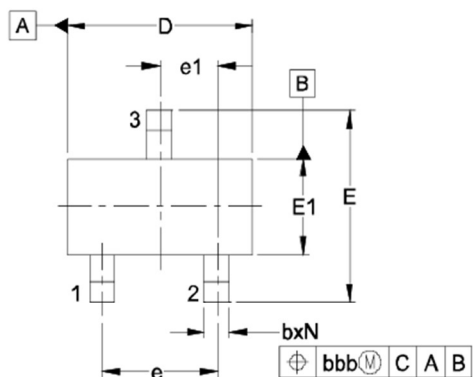


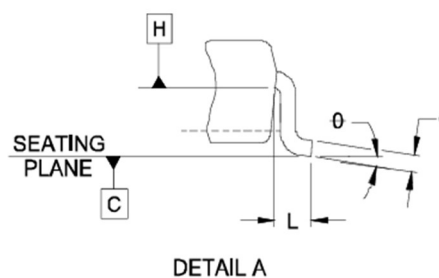
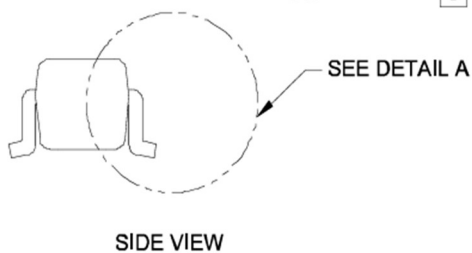
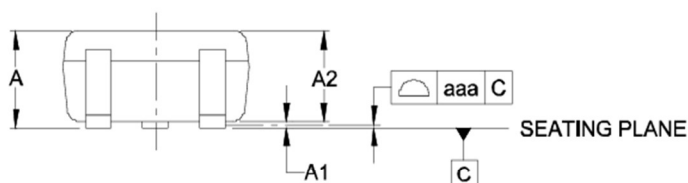
Figure 7. Safe operating area



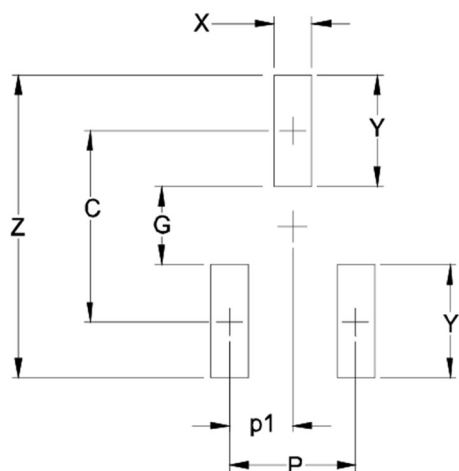
Package Outline Dimensions (Units: mm) SOT-523



DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.023	-	.035	0.60	-	0.90
A1	.000	-	.004	0.00	-	0.10
A2	.023	.030	.031	0.60	0.75	0.80
b	.005	-	.012	0.15	-	0.30
c	.003	-	.008	0.10	-	0.20
D	.059	.063	.067	1.50	1.60	1.70
E	.057	.063	.069	1.45	1.60	1.75
E1	.029	.031	.033	0.75	0.80	0.85
e	.039 BSC			1.00 BSC		
e1	.020 BSC			0.50 BSC		
L	(.009)			(0.22)		
N	3			3		
θ	0°	-	8°	0°	-	8°
aaa	.004			0.10		
bbb	.008			0.20		



Suggested Pad Layout



SYM	DIMENSIONS	
	INCHES	MILLIMETERS
C	(.055)	(1.40)
P	.039	1.00
P1	.020	0.50
G	.024	0.60
X	.016	0.40
Y	.031	0.80
Z	.087	2.20

Order Information

Part Number	Package	Quantity
Sh2N7002KT	SOT-523	3000