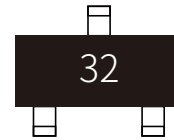


## FEATURES

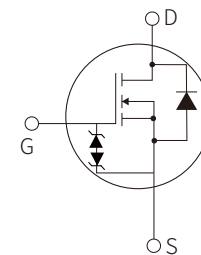
- | High Density Cell Design For Low  $R_{DS(On)}$
- | Voltage Controlled Small Signal Switch
- | Rugged and Reliable
- | High Saturation Current Capability
- | ESD Protected



SOT-723



Marking



Schematic Symbol

## APPLICATION

- | Direct logic-level interface: TTL/CMOS
- | Drivers: relays, solenoids, lamps
- | hammers, display, memories, etc.
- | Battery operated systems
- | Solid-state relays

## APPROVALS

<b>RoHS</b>	Compliance with 2011/65/EU
<b>HF</b>	Compliance with IEC61249-2-21:2003

## ABSOLUTE MAXIMUM RATINGS

Parameter	Conditions	Symbol	Value	Unit
Drain-Source Voltage	$T_A=25^{\circ}\text{C}$	$V_{DS}$	20	V
Gate-Source Voltage	$T_A=25^{\circ}\text{C}$	$V_{GS}$	$\pm 10$	V
Drain Current ( DC )	$T_A=25^{\circ}\text{C}, V_{GS}=4.5\text{V}$	$I_D$	0.92	A
	$T_A=100^{\circ}\text{C}, V_{GS}=4.5\text{V}$		0.57	A
Drain Current ( Pulsed )	$T_A=25^{\circ}\text{C}, V_{GS}=4.5\text{V}$	$I_{DM}^{***}$	3.69	A
Total Power Dissipation	$T_A=25^{\circ}\text{C}$	$P_{tot}$	0.41	W
Junction Temperature		$T_J$	150	$^{\circ}\text{C}$
Storage Temperature		$T_{STG}$	-55 to 150	$^{\circ}\text{C}$
Maximum Resistance – Junction to Ambient	$T_A=25^{\circ}\text{C}$	$I_S$	0.92	A
Thermal Resistance- Junction to Ambient		$R_{\theta JA}$	300	$^{\circ}\text{C}/\text{W}$

**Notes:**

 \* Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10$  sec

 \*\* Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	20			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	0.5		1	V
Drain Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V			1	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V			±10	μA
On-State Resistance	R <sub>DS(on)</sub> <sup>a</sup>	V <sub>GS</sub> =4.5V, I <sub>DS</sub> =0.5A		250	300	mΩ
		V <sub>GS</sub> =2.5V, I <sub>DS</sub> =0.3A		320	380	mΩ
		V <sub>GS</sub> =1.8V, I <sub>DS</sub> =0.1A		440	500	mΩ
<b>Diode Characteristics</b>						
Diode Forward Voltage	V <sub>SD</sub> <sup>a</sup>	I <sub>SD</sub> =0.5A, V <sub>GS</sub> =0V			1.2	V
<b>Dynamic Characteristics<sup>b</sup></b>						
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, Frequency = 1 MHz		100		pF
Output capacitance	C <sub>oss</sub>			22		pF
Reverse transfer capacitance	C <sub>rss</sub>			12		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> =10V, V <sub>GEN</sub> =4.5V R <sub>G</sub> =3.9Ω, R <sub>L</sub> =20 Ω, I <sub>DS</sub> =0.5A		7		ns
Turn-on Rise Time	t <sub>r</sub>			5.1		ns
Turn-Off Delay Time	t <sub>d(off)</sub>			18.2		ns
Turn-Off Fall Time	t <sub>f</sub>			5.6		ns
<b>Gate Charge Characteristics<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>DS</sub> =0.5A		1.03		nC
Gate-Source Charge	Q <sub>gs</sub>			0.14		nC
Gate-Drain Charge	Q <sub>gd</sub>			0.16		nC

**Notes:**

a : Pulse test ; pulse width ≤ 300us, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

# PARAMETER CHARACTERISTIC CURVE

Figure1: Power Dissipation

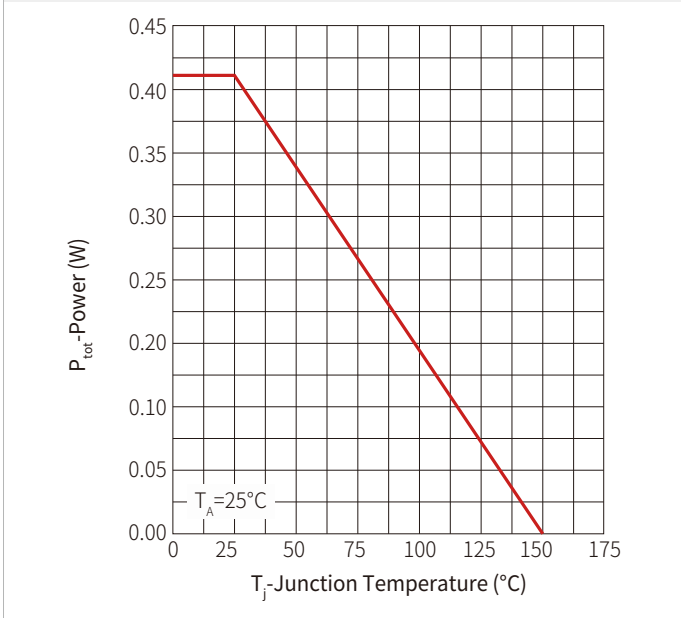


Figure2: Current Capability

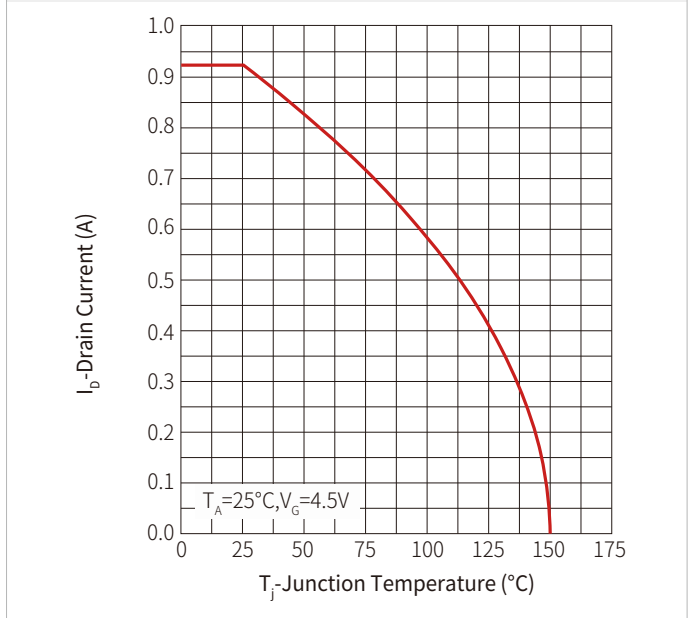


Figure3: Safe Operation Area

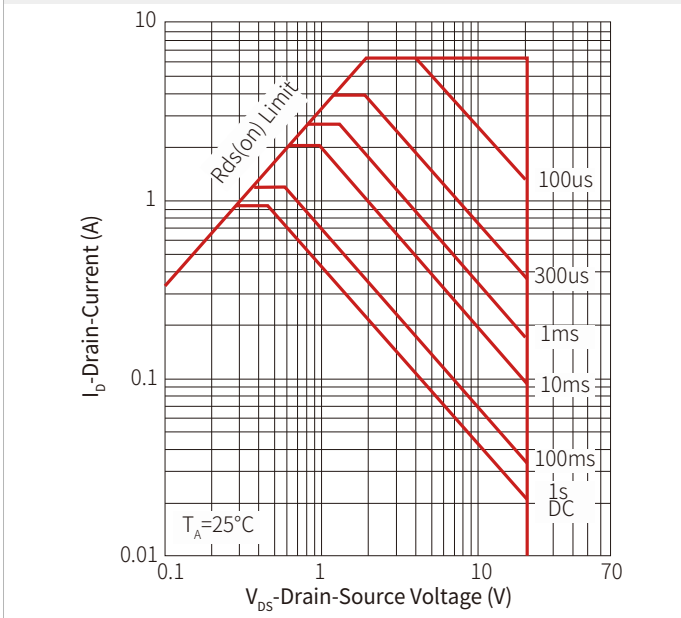
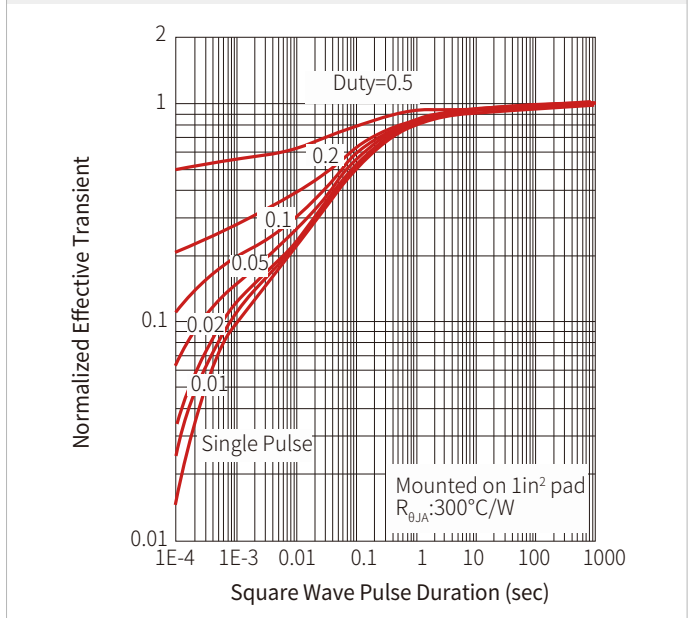
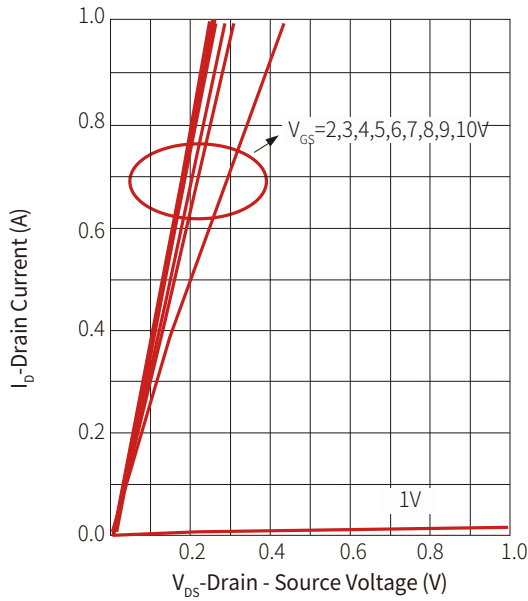


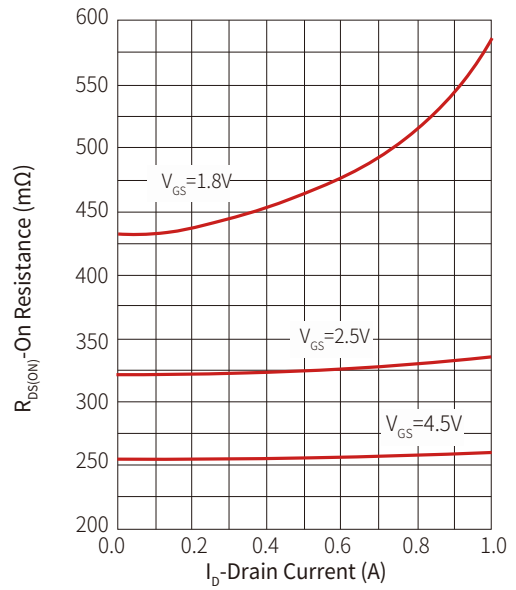
Figure 4: Transient Thermal Impedance



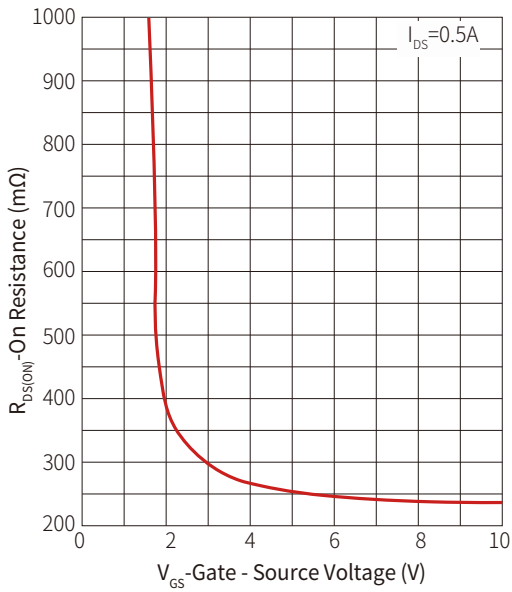
**Figure 5: Output Characteristics**



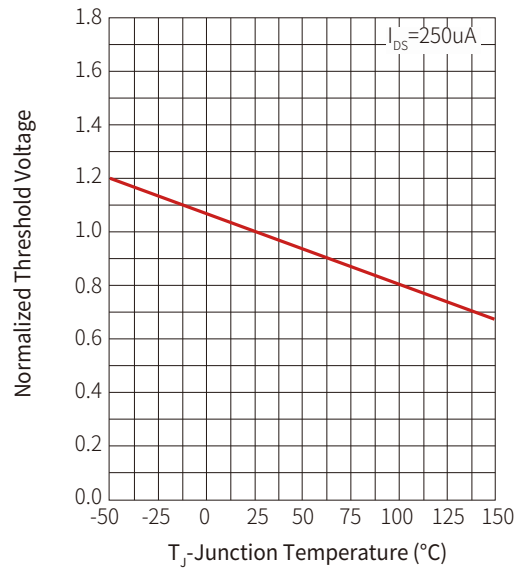
**Figure 6: Drain-Source On Resistance**

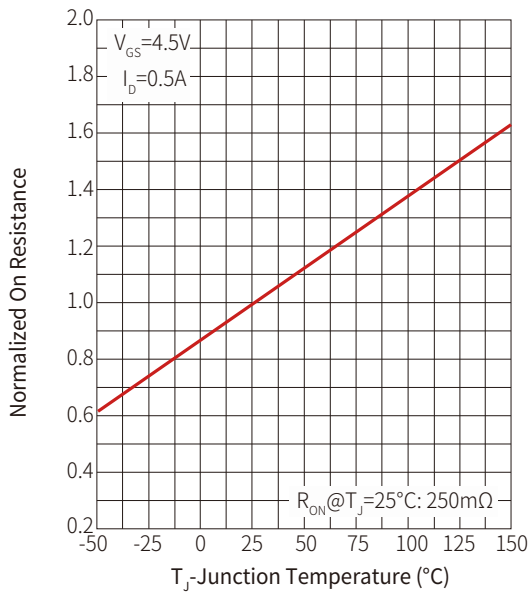
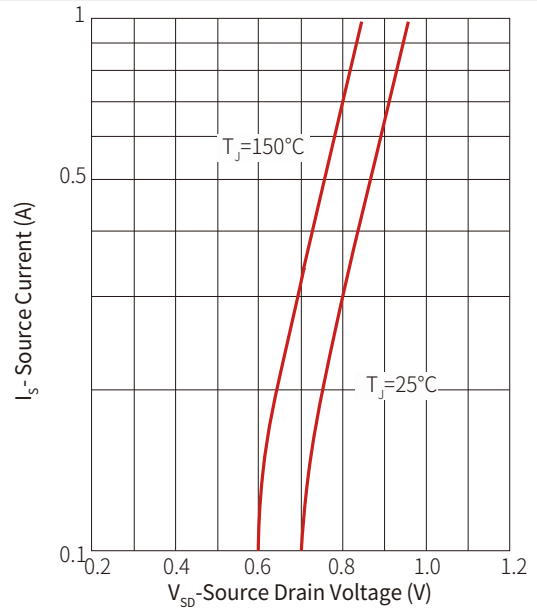
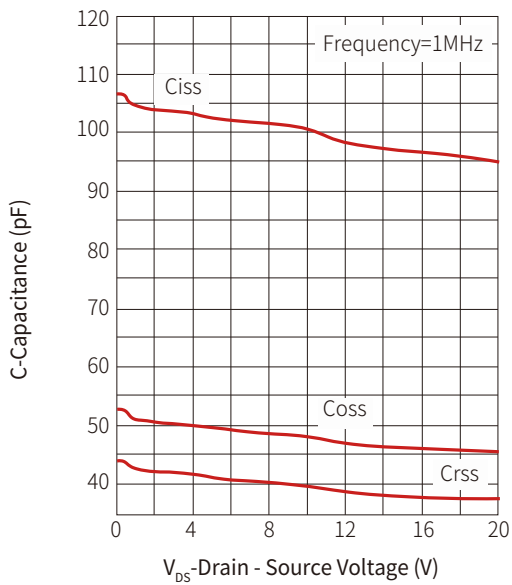
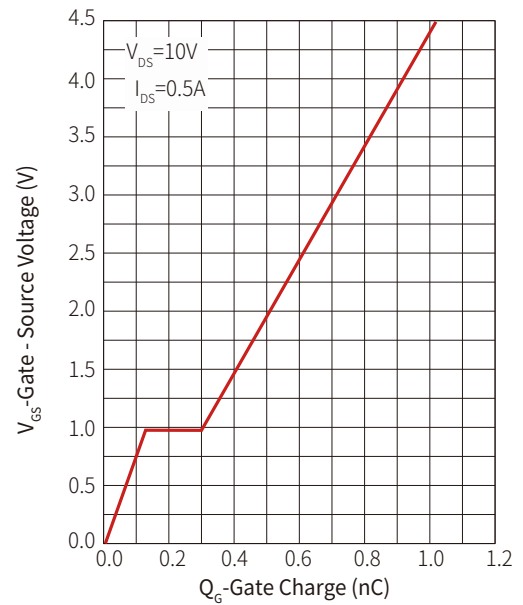


**Figure 7: Transfer Characteristics**

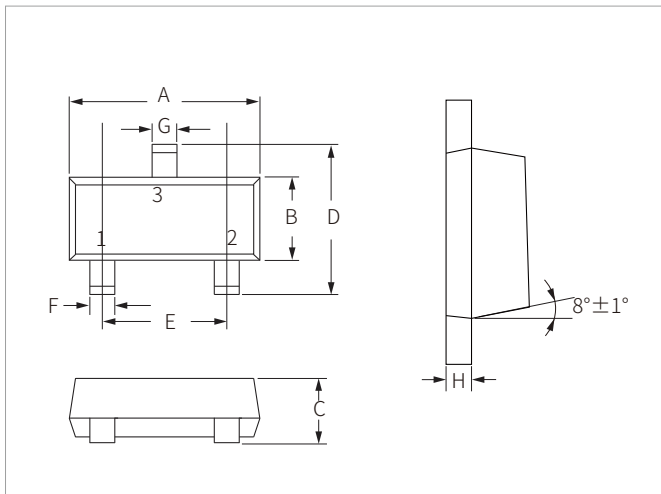


**Figure 8: Normalized Threshold Voltage**



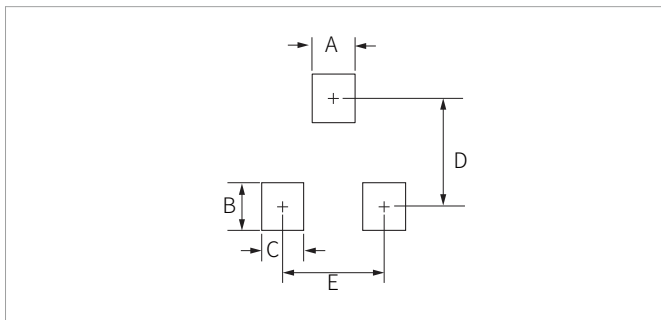
**Figure 9: Normalized On Resistance**

**Figure 10: Diode Forward Current**

**Figure 11: Capacitance**

**Figure 12: Gate Charge**


## SOT-723 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.15	1.35	0.045	0.053
B	0.75	0.85	0.030	0.033
C	0.35	0.45	0.014	0.018
D	1.15	1.35	0.045	0.053
E	0.80TYP		0.031TYP	
F	0.175	0.25	0.007	0.010
G	0.225	0.30	0.009	0.012
H	0.09	0.13	0.003	0.005

## RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters	Inches
	Dimensions	Dimensions
A	0.50	0.020
B	0.45	0.018
C	0.40	0.016
D	1.15	0.045
E	0.80	0.031

## ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SNM72T1N02E	SOT-723	8000PCS	7"

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