

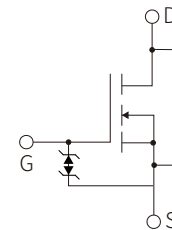
FEATURES

- | High Density Cell Design For Low $R_{DS(On)}$
- | Voltage Controlled Small Signal Switch
- | Rugged and Reliable
- | High Saturation Current Capability
- | Lead free product is acquired



APPLICATION

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



Schematic Symbol

APPROVALS

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

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	0.5	A
Pulsed Drain Current	I_{DM}^{**}	2	A
Total Power Dissipation	P_{tot}^*	0.83	W
Diode Forward Current	I_S	0.5	A
Thermal Resistance- Junction to Ambient	$R_{\theta JA}$	150	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$

Notes:

* Surface Mounted on 1 in² pad area, $t \leq 10$ sec

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

ELECTRICAL CHARACTERISTICS (T_A=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _{DS} =250μA	1	1.5	2	V
Drain Leakage Current	I _{DSS}	V _{DS} =48V, V _{GS} =0V			1	μA
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V		±0.8		μA
Drain-source on-resistance	R _{DS(on)} ^a	V _{GS} =10V, I _{DS} =0.5A		1.5	2	Ω
		V _{GS} =4.5V, I _{DS} =0.2A		2	2.7	
Diode Characteristics						
Diode Forward Voltage	V _{SD} ^a	I _{SD} =0.5A, V _{GS} =0V		0.85		V
Reverse Recovery Time	t _{rr}	I _{SD} =0.5A, dI _{SD} /dt=100A/μs		30		ns
Reverse Recovery Charge	Q _{rr}			29		nC
Diode Characteristics^b						
Gate Resistance	R _G	V _{GS} =V _{DS} =0V, F=1MHz		200		Ω
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, Frequency = 1MHz		14.7		pF
Output capacitance	C _{oss}			0.76		
Reverse transfer capacitance	C _{rss}			0.63		
Turn-on Delay Time	t _{d(on)}	V _{DS} =30V, V _{GEN} =10V R _G =25Ω, R _L =60Ω, I _{DS} =0.5A		2.7		nS
Turn-on Rise Time	t _r			2.5		
Turn-Off Delay Time	t _{d(off)}			13		
Turn-Off Fall Time	t _f			8		
Gate Charge Characteristics^b						
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =10V, I _{DS} =0.5A		0.44		nC
Gate-Source Charge	Q _{gs}			0.2		
Gate-Drain Charge	Q _{gd}			0.1		

Notes:

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

b : Guaranteed by design, not subject to production testing

PARAMETER CHARACTERISTIC CURVE

Figure1: Power Capability

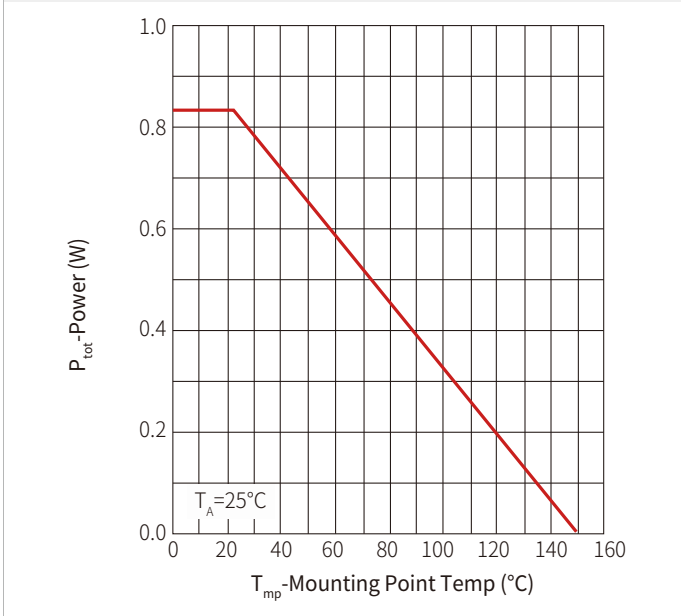


Figure2: Current Capability

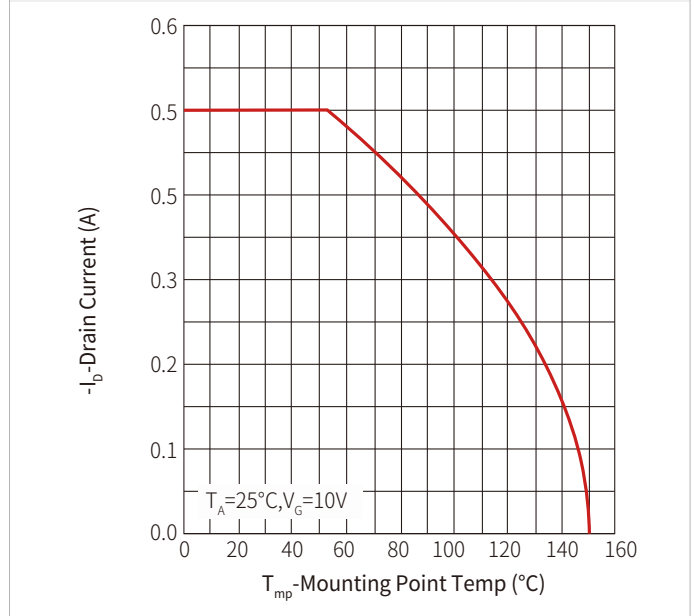


Figure3: Safe Operation Area

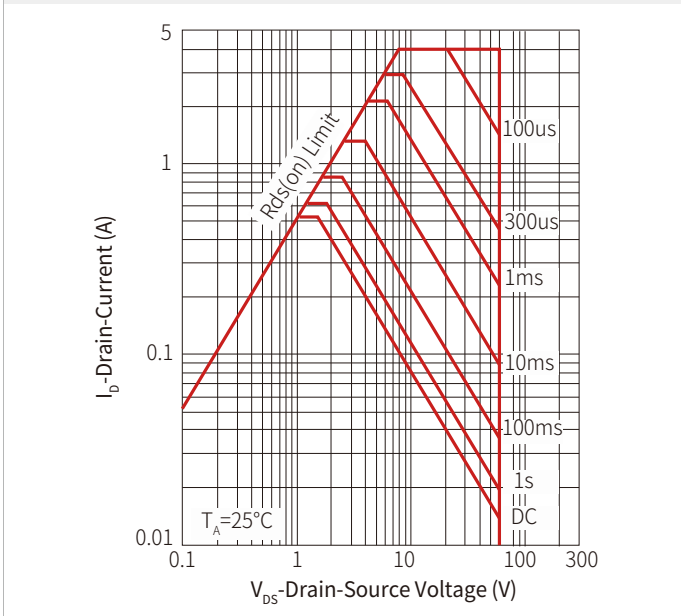


Figure 4: Transient Thermal Impedance

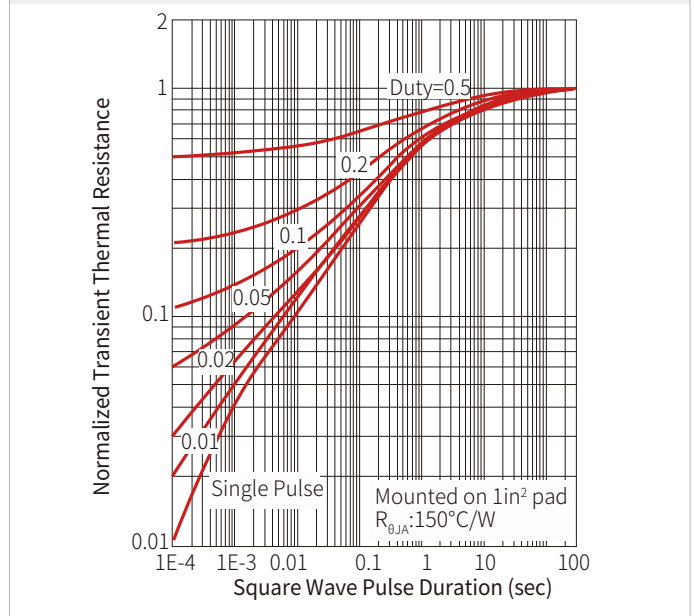


Figure 5: Output Characteristics

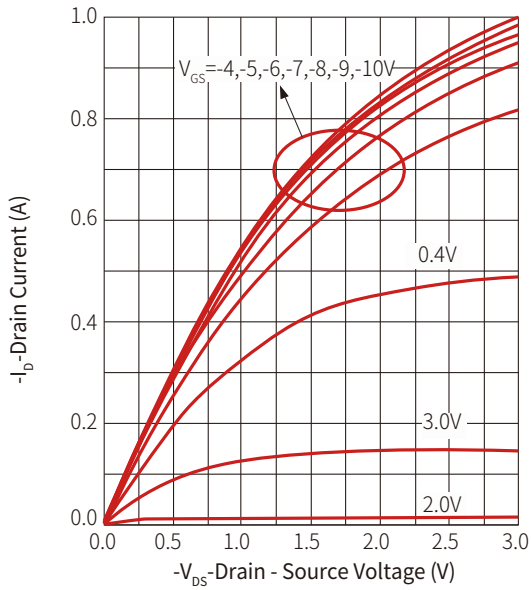


Figure 6: On Resistance

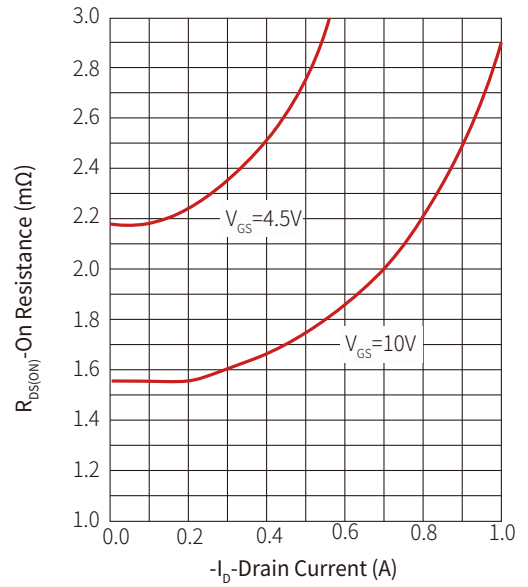


Figure 7: Transfer Characteristics

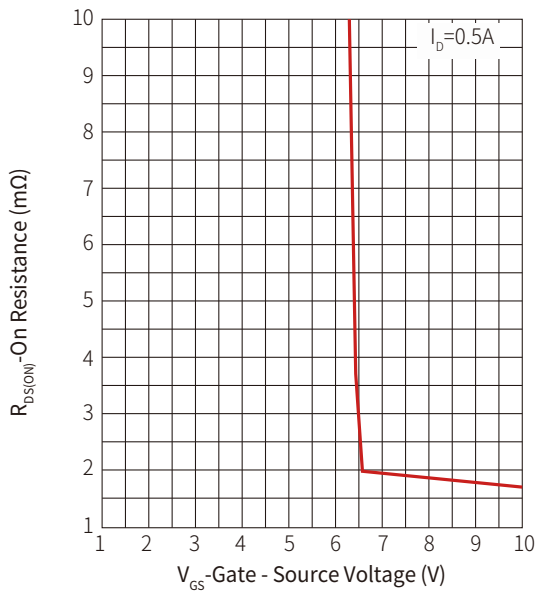


Figure 8: Normalized Threshold Voltage

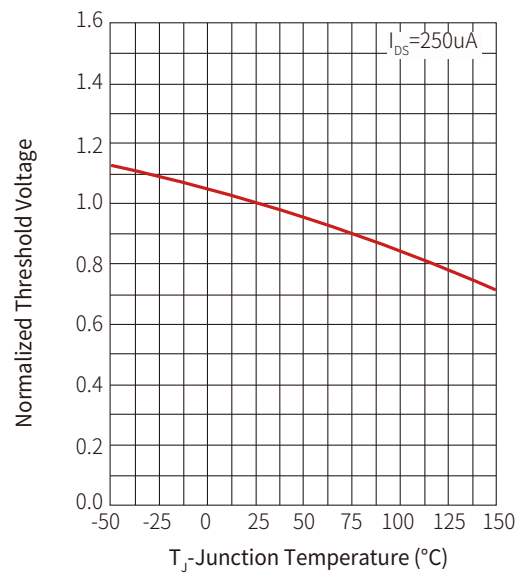


Figure 9: Normalized On Resistance

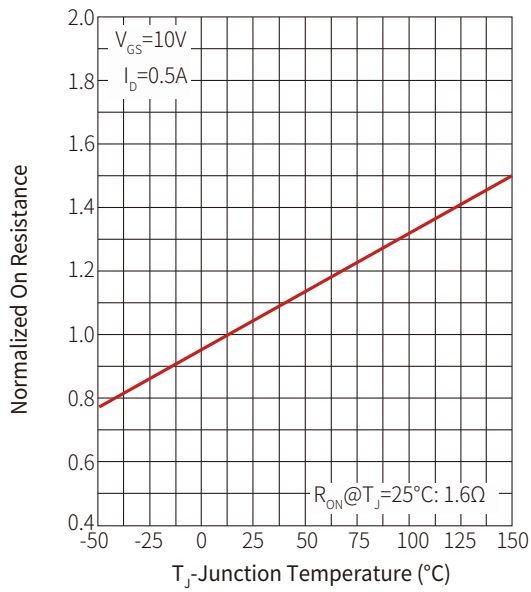


Figure 10: Diode Forward Current

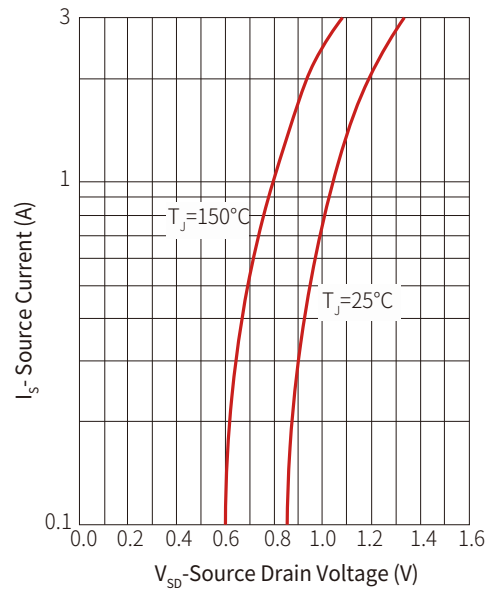


Figure 11: Capacitance

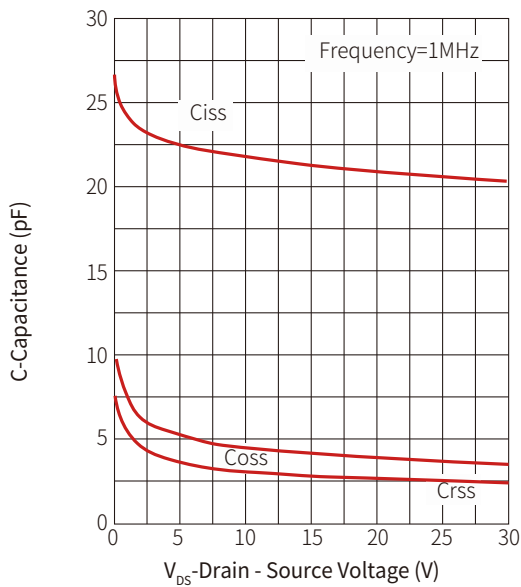
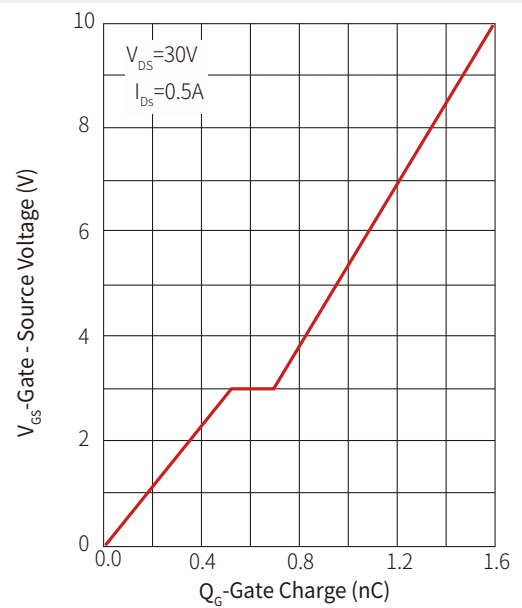
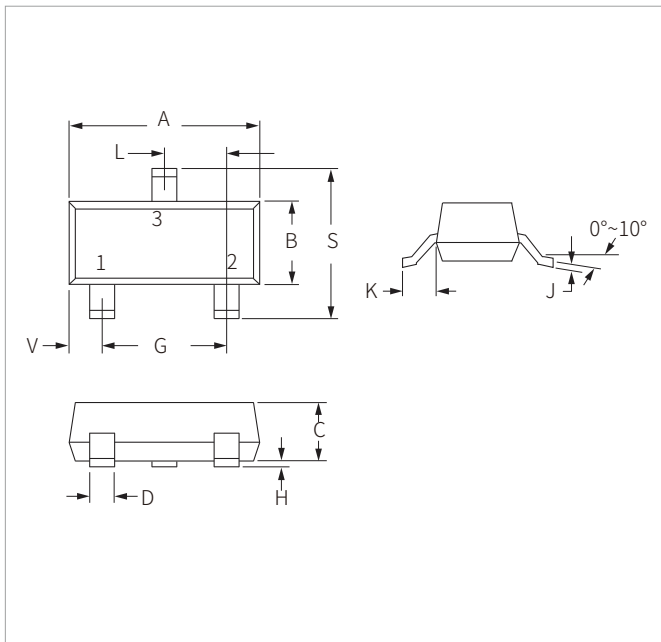


Figure 12: Gate Charge

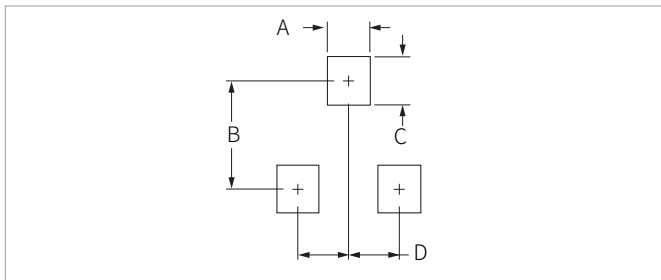


SOT-23 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.80	3.05	0.110	0.120
B	1.20	1.40	0.047	0.055
C	0.90	1.15	0.035	0.045
D	0.37	0.50	0.015	0.020
G	1.75	2.05	0.069	0.081
H	0.01	0.100	0.001	0.004
J	0.085	0.180	0.003	0.007
K	0.35	0.69	0.014	0.029
L	0.89	1.02	0.035	0.040
S	2.10	2.65	0.083	0.104
V	0.45	0.60	0.018	0.024

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.70	1.00	0.028	0.039
B	2.30	2.50	0.090	0.098
C	0.70	1.00	0.028	0.039
D	0.80	1.10	0.032	0.043

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
2N7002KE	SOT-23	3000PCS	7"

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By QR Code

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