

## N-Channel Enhancement MOSFET

### Features

- Trench Power MV MOSFET Technology
- Voltage Controlled Small Signal Switch
- Low Input Capacitance
- Halogen-Free & Lead-Free
- ESD Protected up to 2KV (HBM)

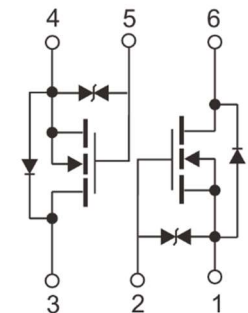
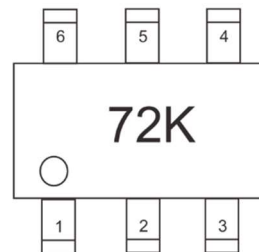
Product Summary		
$V_{DS}$	$R_{DS(on)}$ ( $\Omega$ ) Typ	$I_D$ (mA)
60V	2.0@ 4.5V 0.2A	300
	1.9@ 10V 0.3A	

### Application

- Load Switch for Portable Devices
- Solid-state relays
- Direct logic-level interface: TTL/CMOS

### Marking information

SOT-363



N-channel MOSFET

### 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 ( $T_A=25^\circ\text{C}$ )	$V_{GS}$	$\pm 20$	V
Continuous drain current ( $T_A=25^\circ\text{C}$ )	$I_D$	0.3	A
Continuous drain current ( $T_A=70^\circ\text{C}$ )	$I_D$	0.24	A
Peak Drain Current, Pulsed <sup>1)</sup>	$I_{DM}$	1.5	A
Power Dissipation	$P_D$	0.3	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 <sup>2)</sup>	$R_{\theta JA}$	416	$^\circ\text{C/W}$

**Characteristics at T<sub>J</sub> = 25°C unless otherwise specified**

Parameter	Symbol	Min.	Typ.	Max.	Unit
<b>STATIC PARAMETERS</b>					
Drain-Source Breakdown Voltage at V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	BV <sub>DSS</sub>	60			V
Drain-Source Leakage Current at V <sub>DS</sub> =60V, V <sub>GS</sub> =0V	I <sub>DSS</sub>			1	μA
Gate Leakage Current at V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	I <sub>GSS</sub>			±10	μA
Gate-Source Threshold Voltage at V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	V <sub>GS(th)</sub>	1	1.5	2.5	V
Drain-Source On-State Resistance at V <sub>GS</sub> =10V, I <sub>D</sub> =300mA at V <sub>GS</sub> =4.5V, I <sub>D</sub> =200mA	R <sub>DS(on)</sub>		1.9 2.0	2.5 3	Ω
<b>DYNAMIC PARAMETERS</b>					
Input Capacitance at V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz	C <sub>iss</sub>		27		pF
Output Capacitance at V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz	C <sub>oss</sub>		3		pF
Reverse Transfer Capacitance at V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz	C <sub>rss</sub>		2		pF
Gate charge total at V <sub>DS</sub> =30V, I <sub>D</sub> =0.3A, V <sub>GS</sub> =10V	Q <sub>g</sub>		1.65		nC
Gate to Source Charge at V <sub>DS</sub> =30V, I <sub>DS</sub> =0.3A, V <sub>GS</sub> =10V	Q <sub>gs</sub>		10.4		nC
Gate to Drain Charge at V <sub>DS</sub> =30V, I <sub>DS</sub> =0.3A, V <sub>GS</sub> =10V	Q <sub>gd</sub>		0.24		nC
Turn-On Delay Time at V <sub>DD</sub> =25V, I <sub>D</sub> =0.3A, R <sub>GEN</sub> =6Ω, V <sub>GS</sub> =10V	t <sub>d(on)</sub>		6.5		nS
Turn-Off Delay Time at V <sub>DD</sub> =25V, I <sub>D</sub> =0.3A, R <sub>GEN</sub> =6Ω, V <sub>GS</sub> =10V	t <sub>d(off)</sub>		9.6		nS
<b>Body-Diode PARAMETERS</b>					
Drain-Source Diode Forward Voltage at I <sub>S</sub> =0.3A, V <sub>GS</sub> =0V	V <sub>SD</sub>			1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>			300	mA
Body Diode Reverse Recovery Time at V <sub>R</sub> =25V, V <sub>GS</sub> =0V I <sub>S</sub> =0.3A, di/dt=100A/μs	trr		24		nS

Note:

- 1) Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
- 2) Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

**Electrical Characteristics Curves**

Figure 1. Output Characteristics

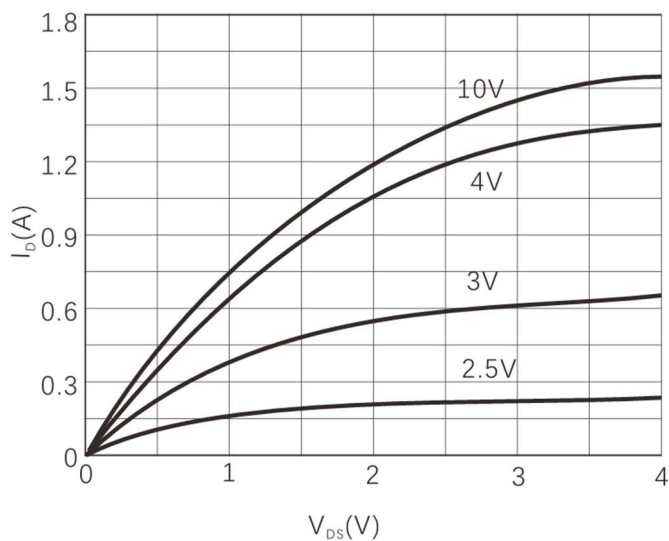


Figure 2. Transfer Characteristics

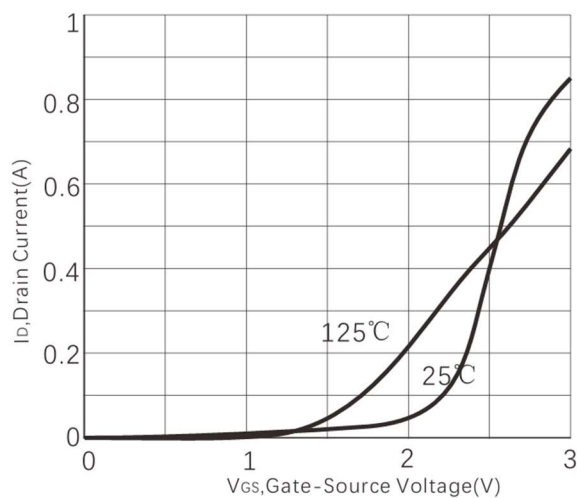


Figure 3. On-Resistance vs. Drain Current

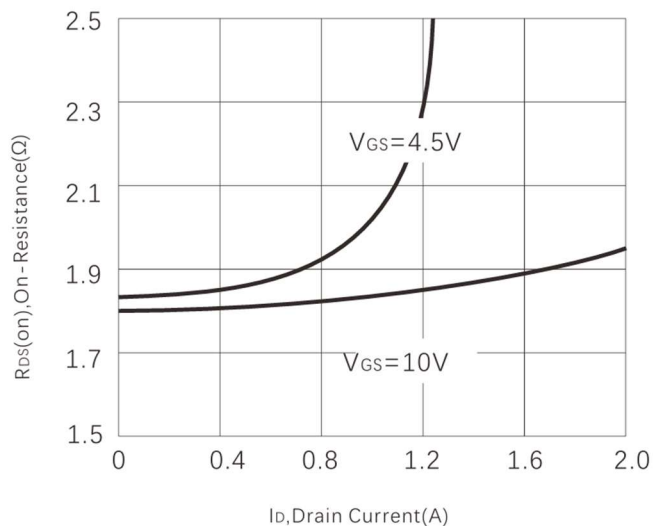


Figure 4. Capacitance

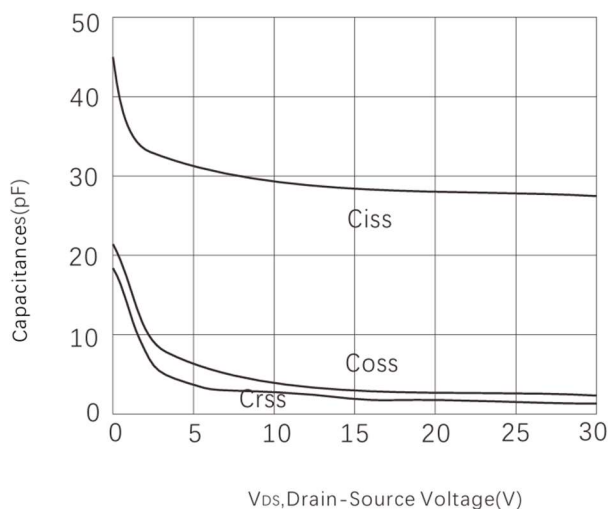


Figure 5. Gate charge

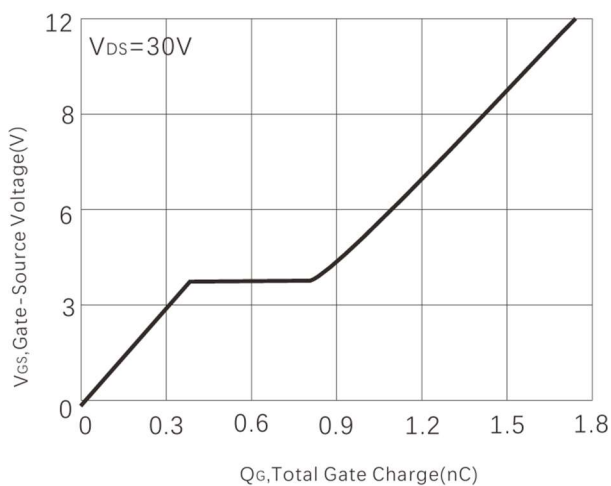
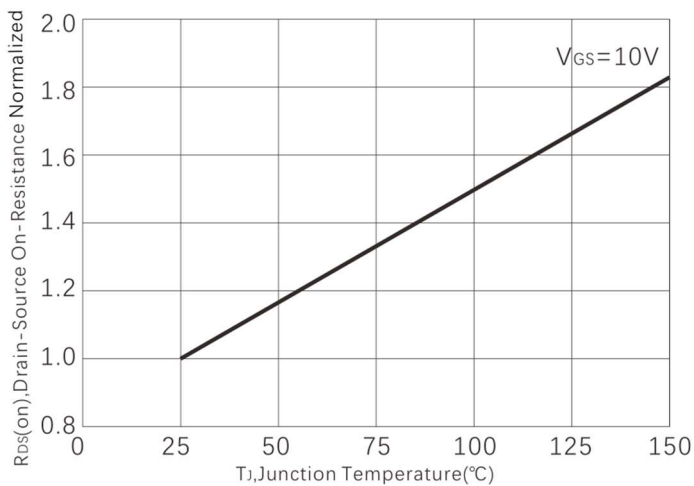


Figure 6. Normalized  $R_{DS(on)}$  vs Junction Temperature



## Electrical Characteristics Curves

Figure 7. Safe operating area

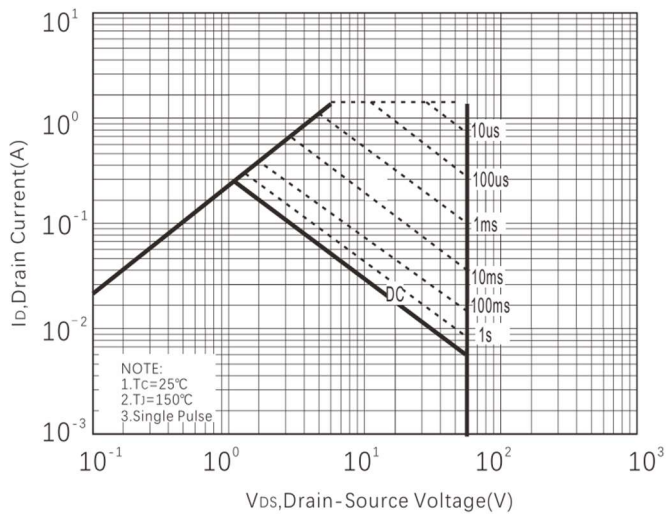
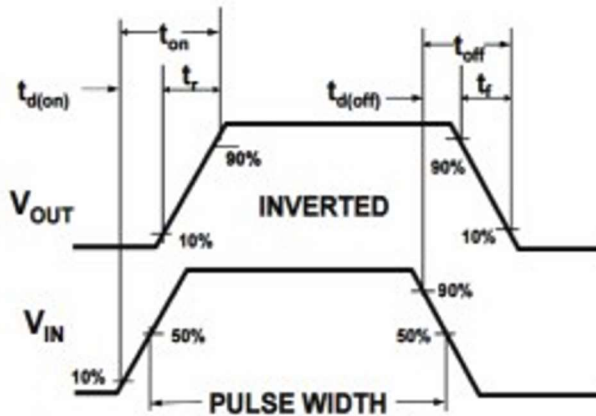
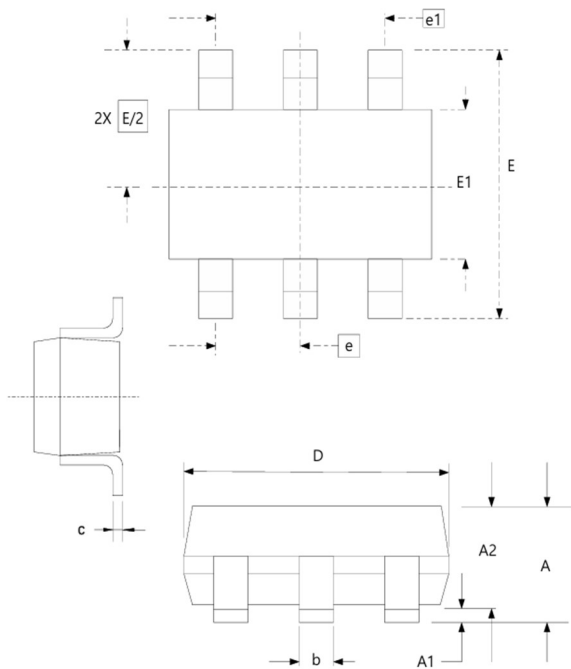


Figure8.Switching wave

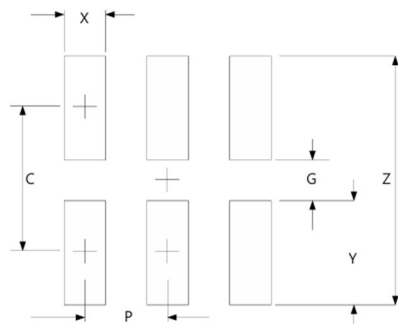


## Package Outline Dimensions (Units: mm) SOT-363



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90		1.10	0.035		0.043
A1	0.00		0.10	0.000		0.004
A2	0.70	0.90	1.00	0.028	0.035	0.039
b	0.15		0.35	0.006		0.014
c	0.08		0.25	0.003		0.010
D	1.80	2.00	2.20	0.071	0.079	0.087
E1	1.15	1.25	1.35	0.045	0.049	0.053
E	2.15	2.30	2.45	0.085	0.091	0.096
e	0.65 BSC			0.026 BSC		
e1	1.30 BSC			0.051 BSC		

## Suggested Pad Layout



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	1.85	0.073
G	1.00	0.039
P	0.65	0.026
X	0.40	0.016
Y	0.85	0.033
Z	2.70	0.106

## Order Information

Part Number	Package	Quantity
Sh2N7002KDW	SOT-363	3000