

**SuperMOS –SOT-23 30V BV<sub>DSS</sub> 16mΩ R<sub>DS(on)</sub> 6.2A I<sub>D</sub>, N-channel MOSFET**

**1. Description**

The CJ3404-ES is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent R<sub>DS(ON)</sub> with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product CJ3404-ES is Pb-free.

**2. Features**

- 30V, R<sub>DS(ON)</sub>=16mΩ(Typ), V<sub>GS</sub>=10V  
R<sub>DS(ON)</sub>=26mΩ(Typ), V<sub>GS</sub>=4.5V
- Use trench MOSFET technology
- High density cell design for low R<sub>DS(on)</sub>
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

**3. Applications**

- PWM applications
- Load switch
- DC/DC conversion
- Power management in portable/desktop PCs

**4. Ordering Information**

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
CJ3404-ES	SOT-23	R4	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7 inches

Table-1 Ordering information

**5. Pin Configuration and Functions**

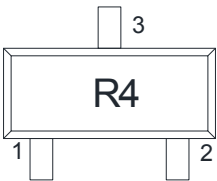
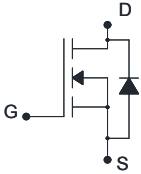
Pin	Function	Outline	Circuit Diagram
2	Source		
1	Gate		
3	Drain		

Table-2 Pin configuration

**6. Specification**

## Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$BV_{DSS}$	30	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$T_A=25^{\circ}C$	6.2	A
	$T_A=75^{\circ}C$	4.7	
Maximum Power Dissipation	$T_A=25^{\circ}C$	1.4	W
	$T_A=75^{\circ}C$	0.9	
Pulsed Drain Current <sup>a</sup>	$I_{DM}$	24.8	A
Operating Junction Temperature	$T_J$	150	°C
Lead Temperature	$T_L$	260	°C
Storage Temperature Range	$T_{stg}$	-55 to 150	°C

### Thermal resistance ratings

Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance <sup>a</sup>	$R_{\theta JA}$	72	90	°C/W

Note:

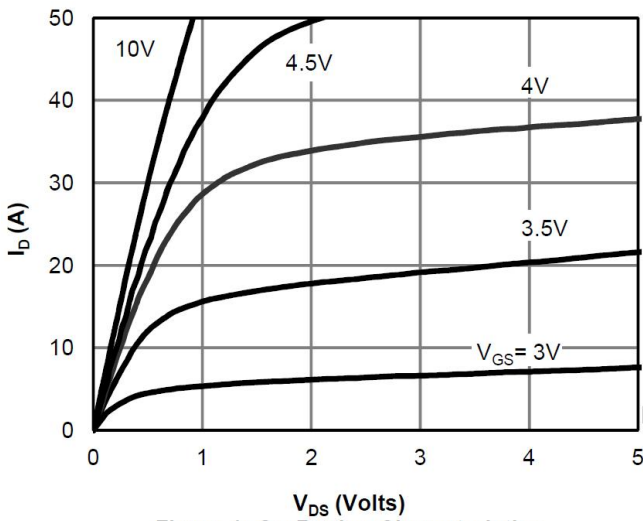
a: Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

## Electrical Characteristics

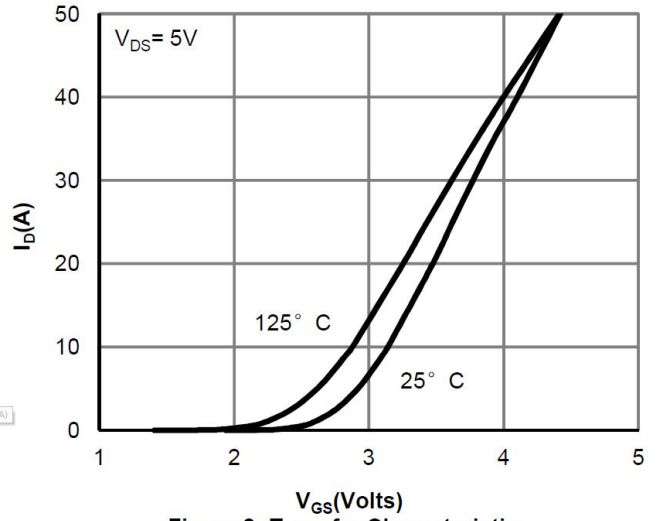
At TA = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V$			1.0	$\mu A$
Gate-to-source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.5	2.2	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=6.2A$		16	24	m $\Omega$
		$V_{GS}=4.5V, I_D=4A$		26	38	
Forward Trans conductance	$g_{FS}$	$V_{DS}=5.0V, I_D=5A$			40	S
<b>CHARGES, CAPACITANCES AND GATE RESISTANCE</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0V, f=1MHz, V_{DS}=15V$		255		pF
Output Capacitance	$C_{OSS}$			45		
Reverse Transfer Capacitance	$C_{RSS}$			35		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS}=10V, V_{DS}=15V, I_D=5A$		9.8	12	nC
Gate-to-Source Charge	$Q_{GS}$			1.8	2.2	
Gate-to-Drain Charge	$Q_{GD}$			2.2	3	
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS}=10V, V_{DS}=15V, R_L=2\Omega, R_{GEN}=3\Omega$		5		ns
Rise Time	$t_r$			3.2		
Turn-Off Delay Time	$t_{d(OFF)}$			24		
Fall Time	$t_f$			6		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1.0A$	0.45		1.2	V

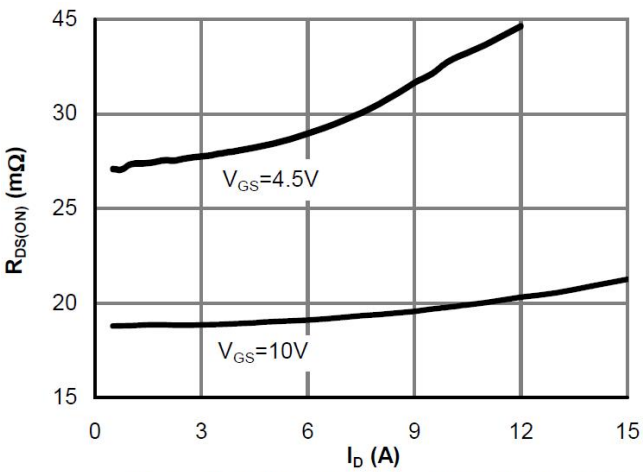
**7. Typical Characteristic**



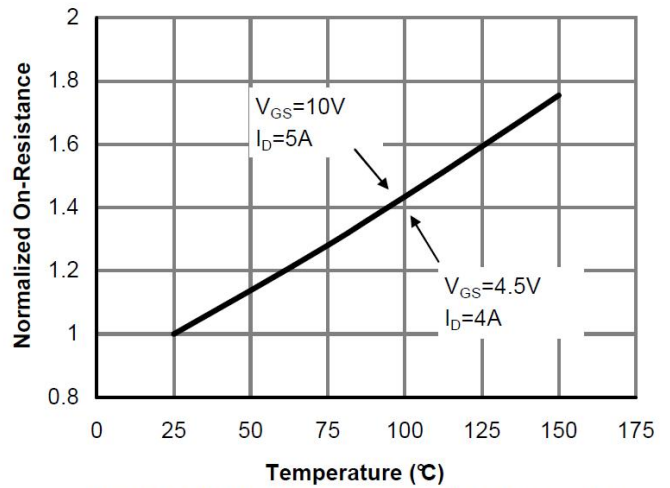
**Figure 1: On-Region Characteristics**



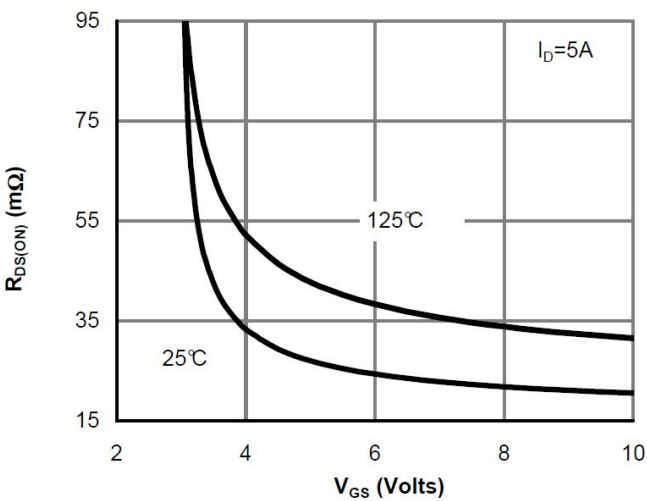
**Figure 2: Transfer Characteristics**



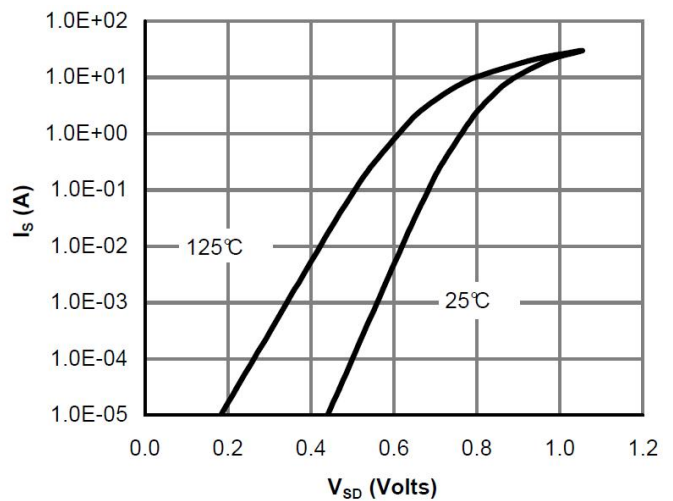
**Figure 3: On-Resistance vs. Drain Current and Gate Voltage**



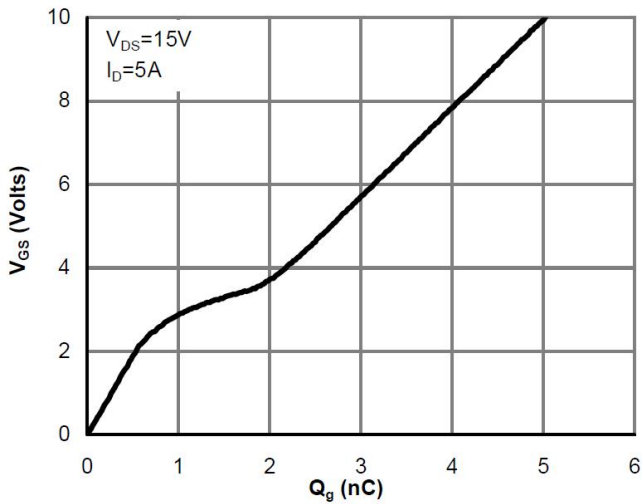
**Figure 4: On-Resistance vs. Junction Temperature**



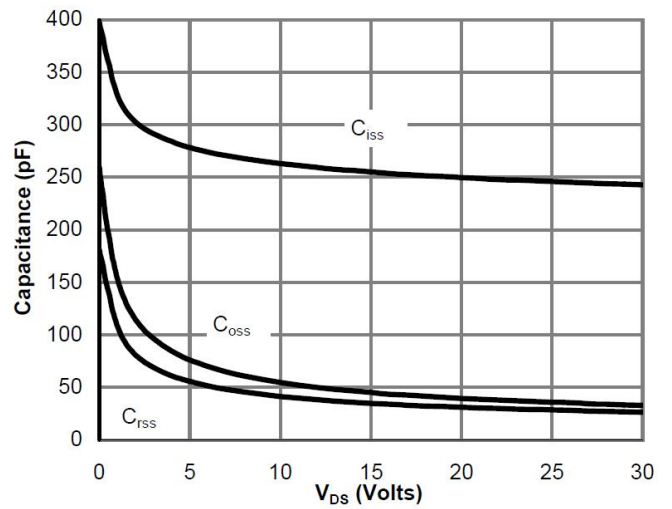
**Figure 5: On-Resistance vs. Gate-Source Voltage**



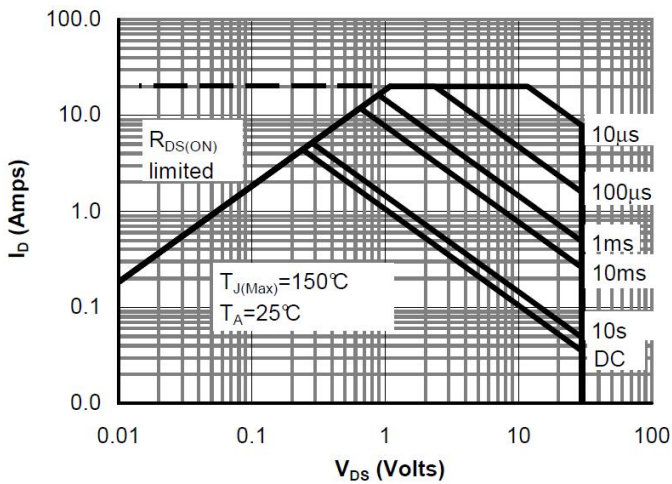
**Figure 6: Body-Diode Characteristics**



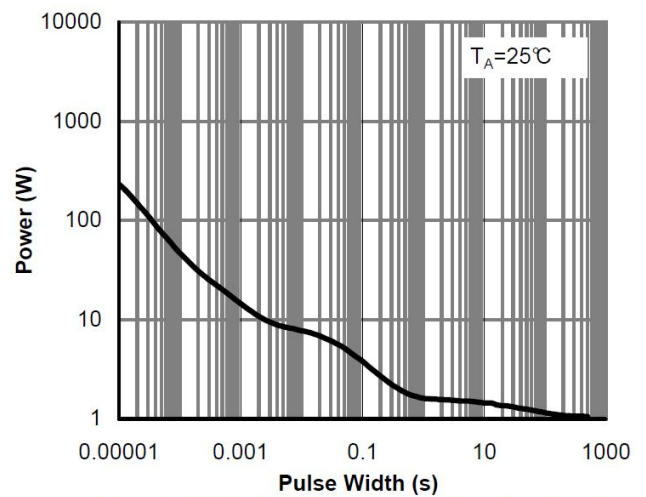
**Figure 7: Gate-Charge Characteristics**



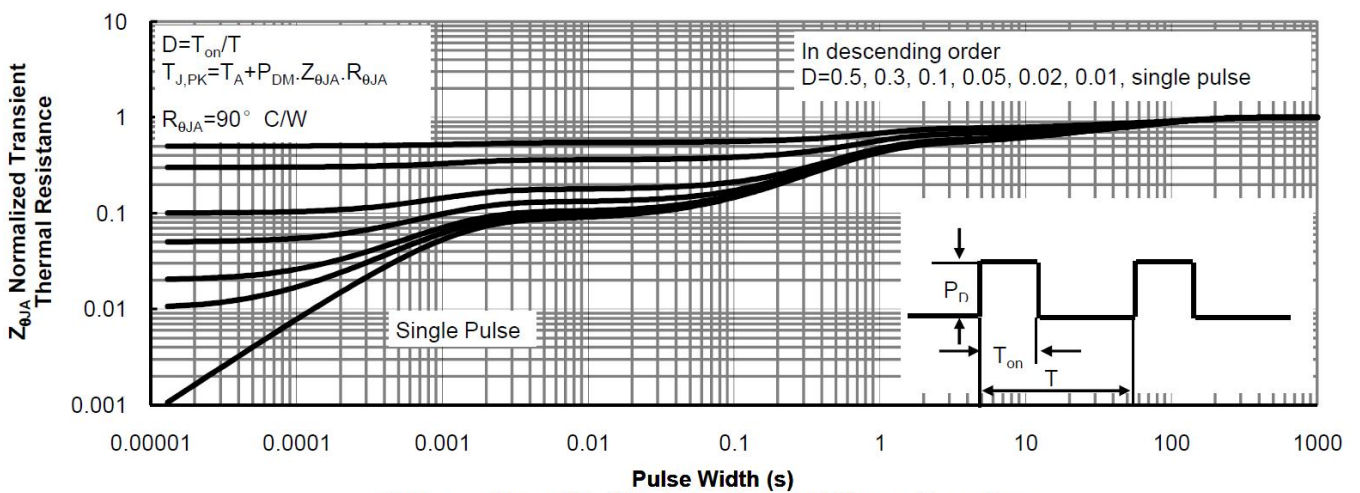
**Figure 8: Capacitance Characteristics**



**Figure 9: Maximum Forward Biased Safe Operating Area**

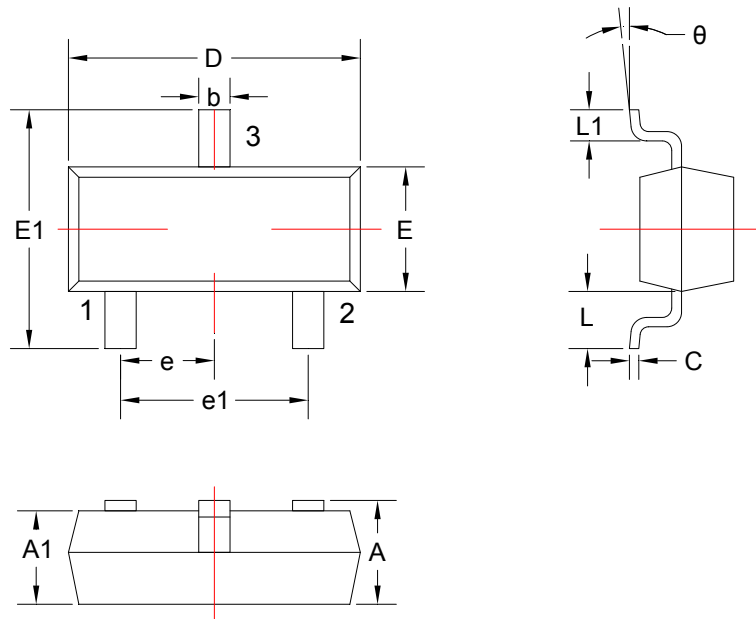


**Figure 10: Single Pulse Power Rating Junction-to-Ambient**



**Figure 11: Normalized Maximum Transient Thermal Impedance**

**8. Dimension (SOT-23)**



Units: mm

Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	0.900	1.150	E1	2.250	2.550
A1	0.900	1.050	e	0.950TYP	
b	0.300	0.500	e1	1.800	2.000
c	0.080	0.150	L	0.550REF	
D	2.800	3.00	L1	0.300	0.500
E	1.200	1.400	$\theta$	0°	8°



**Note:**

1. Controlling dimension: in millimeters
2. General tolerance:  $\pm 0.05$ mm
3. The pad layout is for reference only
4. Unit: mm

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