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2SK4124

N-Channel Power MOSFET 500V, 20A, 430mΩ, TO-3P-3L

Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching
- Adoption of high reliability HVP process
- Avalanche resistance guarantee

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DS}		500	V
Gate-to-Source Voltage	V_{GS}		±30	V
Drain Current (DC)	I_D		20	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	60	A
Allowable Power Dissipation	P_D		2.5	W
		$T_c = 25^\circ C$ (Our ideal heat dissipation condition)*1	170	W
Channel Temperature	T_{ch}		150	°C
Storage Temperature	T_{stg}		-55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		110	mJ
Avalanche Current *2	I_{AV}		20	A

*1 Our condition is radiation from backside.

The method is applying silicone grease to the backside of the device and attaching the device to water-cooled radiator made of aluminium.

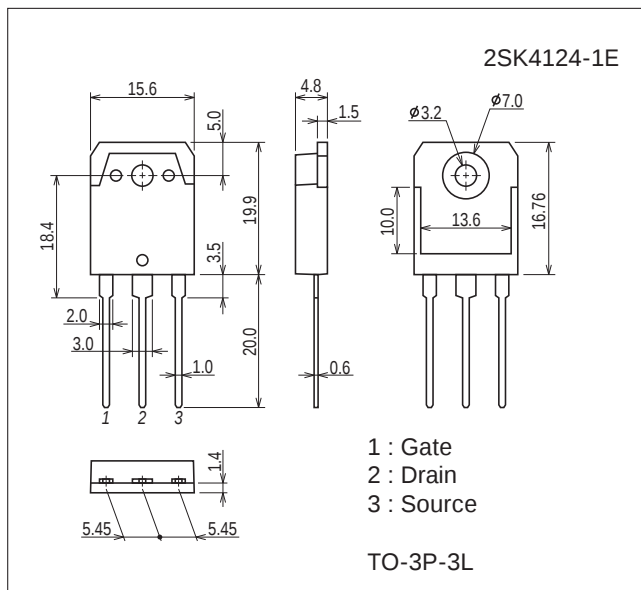
*2 $V_{DD} = 50V$, $L = 500\mu H$, $I_{AV} = 20A$ (Fig.1)*3 $L \leq 500\mu H$, single pulse

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

unit : mm (typ)

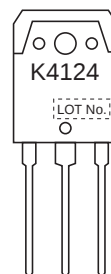
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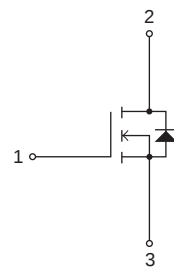
Product & Package Information

- Package : TO-3P-3L
- JEITA, JEDEC : SC-65, TO-247, SOT-199
- Minimum Packing Quantity : 30 pcs./magazine

Marking



Electrical Connection



Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10mA, V_{GS}=0V$	500			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=400V, V_{GS}=0V$			100	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$			± 100	nA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	3		5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=10A$	4.9	9.7		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=8A, V_{GS}=10V$		0.33	0.43	Ω
Input Capacitance	C_{iss}	$V_{DS}=30V, f=1MHz$		1200		pF
Output Capacitance	C_{oss}			250		pF
Reverse Transfer Capacitance	C_{rss}			55		pF
Turn-ON Delay Time	$t_{d(on)}$	See Fig.2		26.5		ns
Rise Time	t_r			95		ns
Turn-OFF Delay Time	$t_{d(off)}$			145		ns
Fall Time	t_f			58		ns
Total Gate Charge	Q_g	$V_{DS}=200V, V_{GS}=10V, I_D=20A$		46.6		nC
Gate-to-Source Charge	Q_{gs}			8.7		nC
Gate-to-Drain "Miller" Charge	Q_{gd}			27.3		nC
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$		1.0	1.3	V

Fig.1 Avalanche Resistance Test Circuit

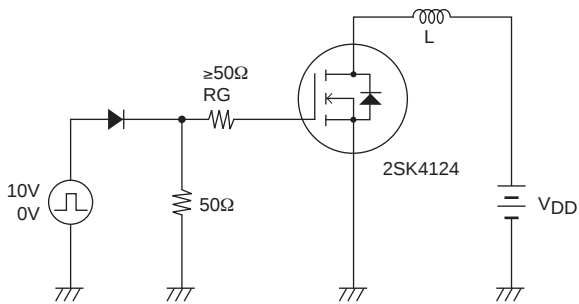
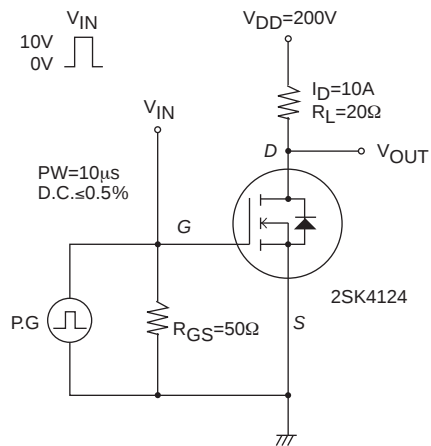
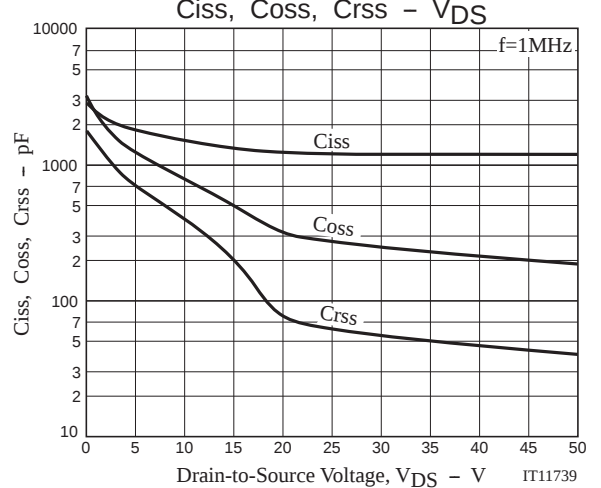
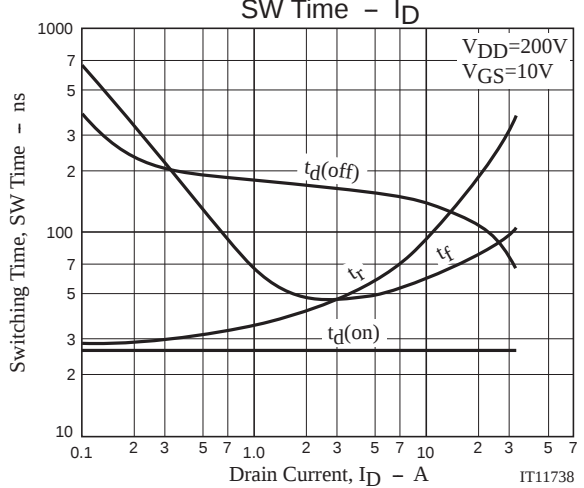
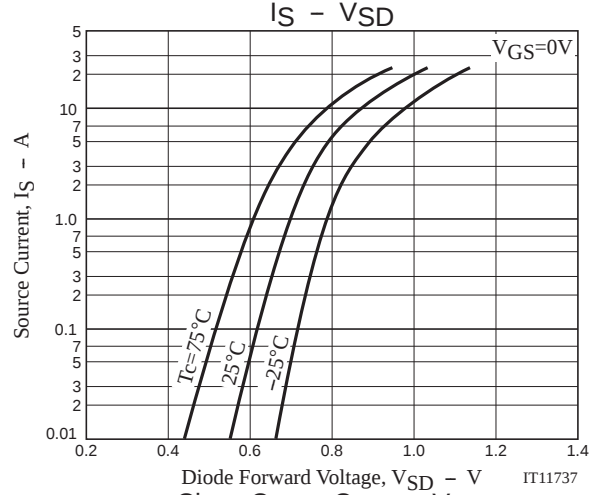
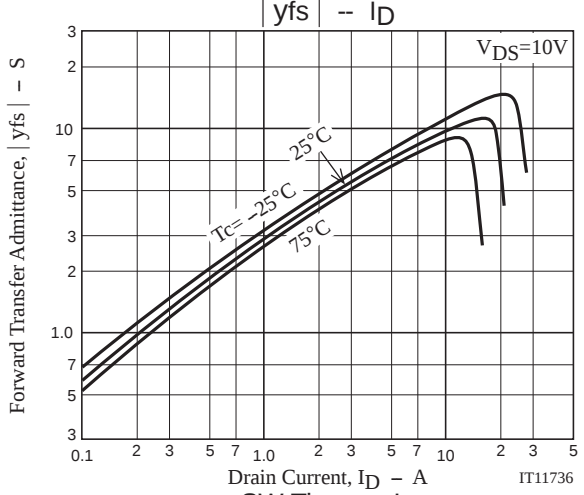
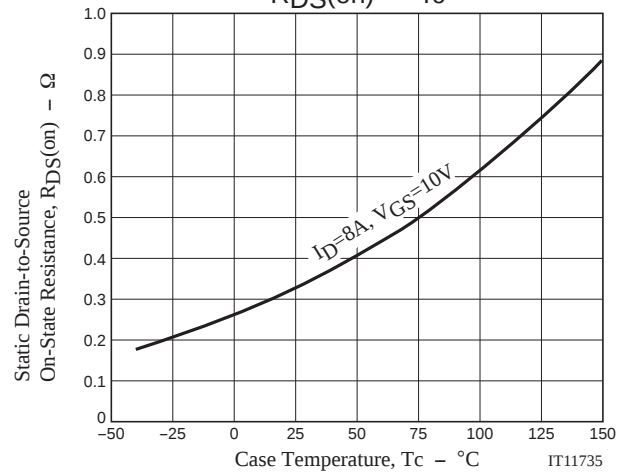
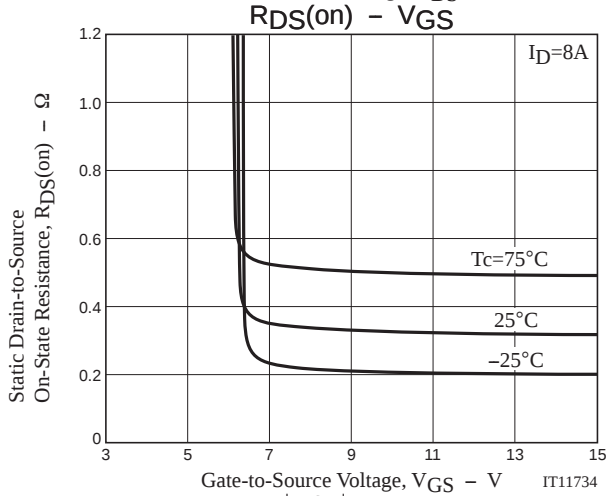
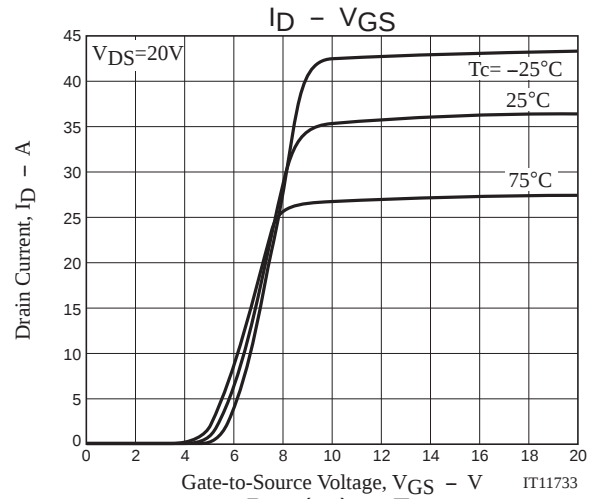
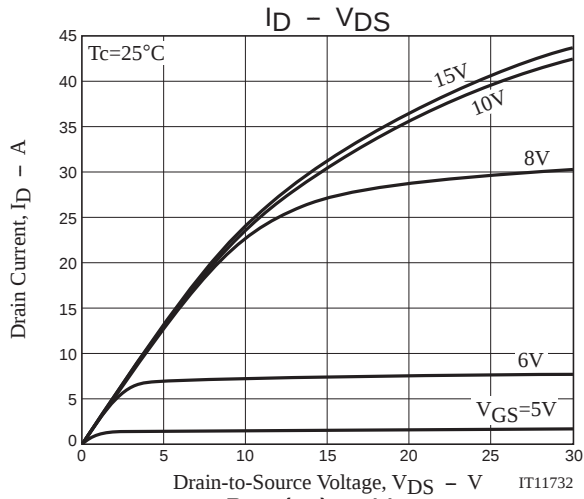


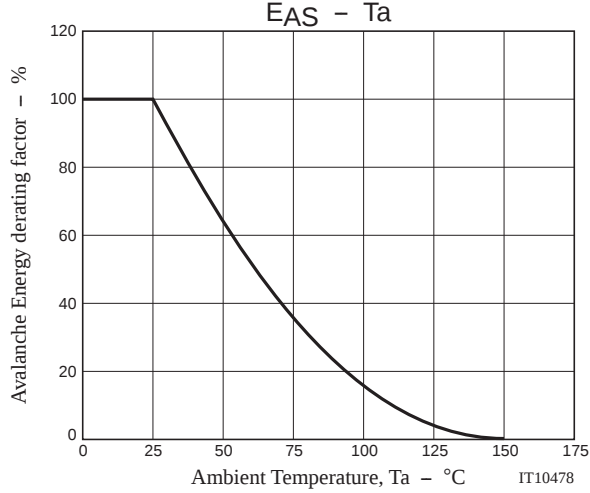
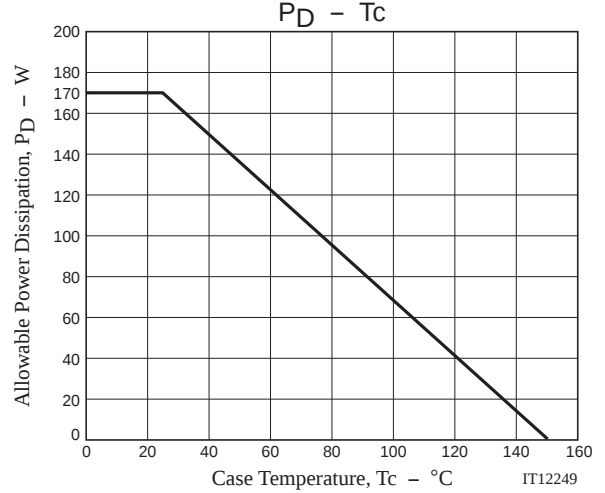
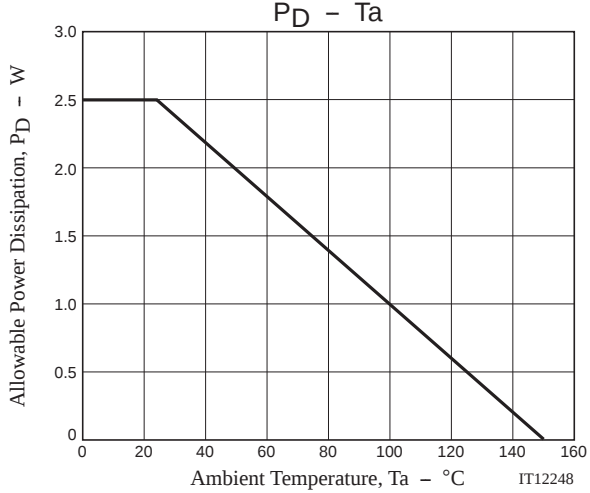
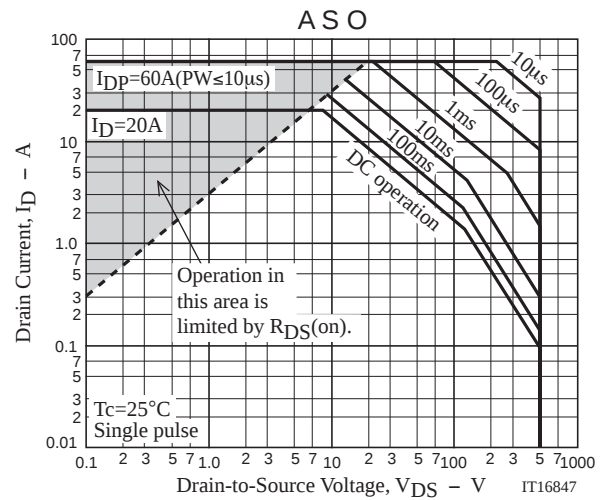
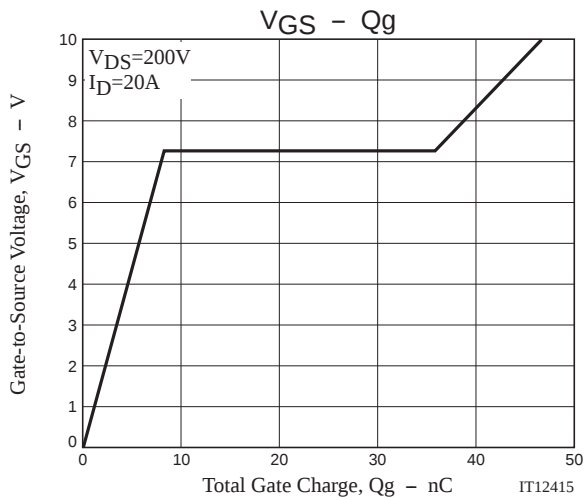
Fig.2 Switching Time Test Circuit



Ordering Information

Device	Package	Shipping	memo
2SK4124-1E	TO-3P-3L	30pcs./magazine	Pb Free





Magazine Specification

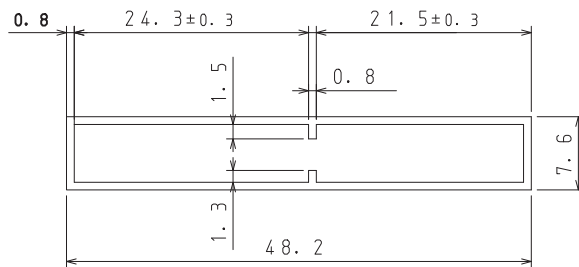
2SK4124-1E

1. Packing Format

Package Name	Maximum Number of devices contained (pcs)			Packing format	
	Magazine	Inner box	Outer box	Inner BOX	Outer BOX
TO-3P-3L	30	450	1800	SPD-0V0001 15 magazines contained Dimensions:mm (external) 568×150×55	SPD-LV0010 4 inner boxes contained Dimensions:mm (external) 590×225×178

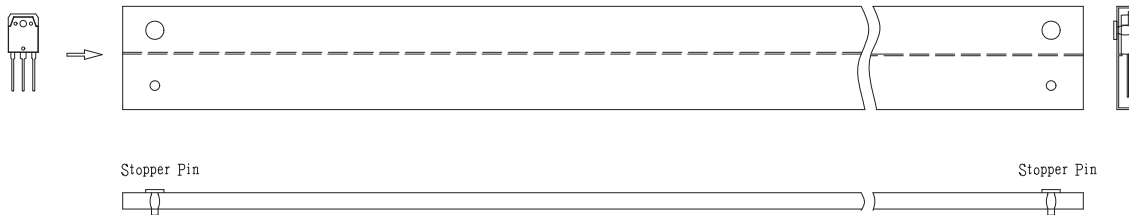
2. Magazine dimensions

(unit:mm)

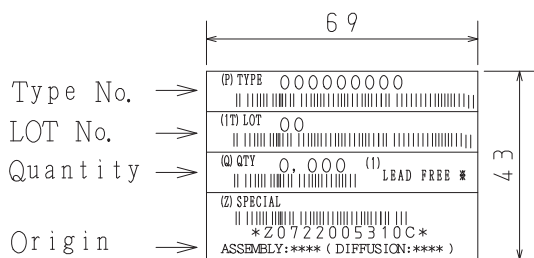


Tolerance=±0.2mm
 Thickness=0.8±0.2mm
 Length =508.0±1mm
 Material =PVC or PET
 (Antistatic treatment)

3. Storage method to magazine



4. Inner box label (unit:mm)



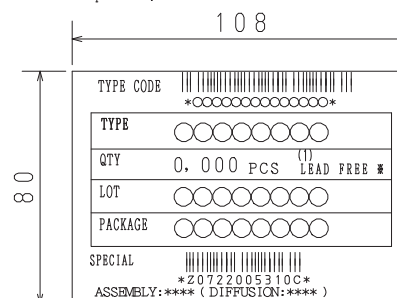
NOTE (1)

The LEAD FREE * description shows that the surface treatment of the terminal is lead free.

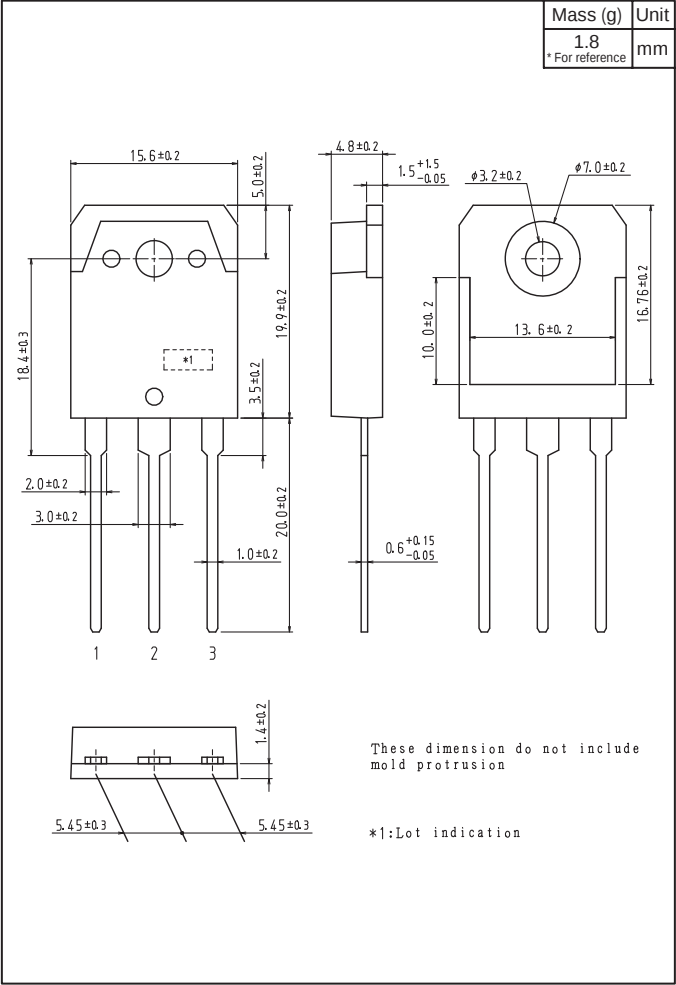
Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

5. Outer box label (unit:mm)

It is a label at the time of factory shipments.
 The form of a label may change in physical distribution process.



Outline Drawing
2SK4124-1E



Note on usage : Since the 2SK4124 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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