



# 2SK3816

## N-Channel Power MOSFET 60V, 40A, 26mΩ, TO-262-3L/TO-263-2L

ON Semiconductor®

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### Features

- ON-resistance  $R_{DS(on)1}=20m\Omega$ (typ.)
- Input capacitance  $C_{iss}=1780pF$ (typ.)
- 4V drive

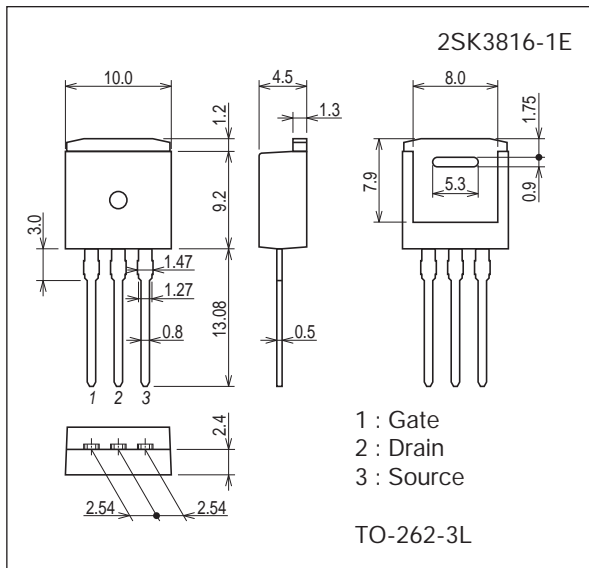
### Specifications

Absolute Maximum Ratings at  $T_a=25^\circ C$

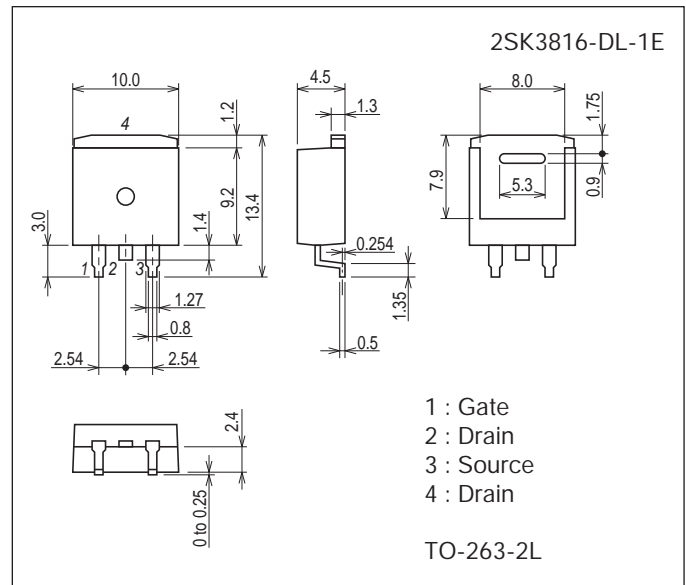
Parameter	Symbol	Conditions	Ratings	Unit
Drain to Source Voltage	$V_{DSS}$		60	V
Gate to Source Voltage	$V_{GSS}$		$\pm 20$	V
Drain Current (DC)	$I_D$		40	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu s$ , duty cycle $\leq 1\%$	160	A
Allowable Power Dissipation	PD		1.65	W
		$T_c=25^\circ C$	50	W

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Package Dimensions unit : mm (typ)  
7537-001



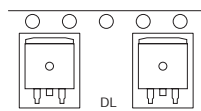
Package Dimensions unit : mm (typ)  
7535-001



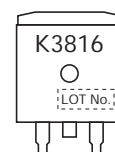
### Ordering & Package Information

Device	Package	Shipping	memo
2SK3816-1E	TO-262-3L (TO-262)	50pcs./tube	Pb Free
2SK3816-DL-1E	TO-263-2L (SC-83, TO-263)	800pcs./reel	

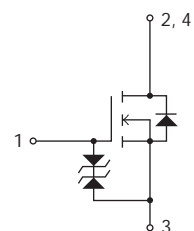
Packing Type : DL



### Marking



### Electrical Connection



Continued from preceding page.

Parameter	Symbol	Conditions	Ratings	Unit
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		-55 to +150	°C
Avalanche Energy (Single Pulse) *1	EAS		60	mJ
Avalanche Current *2	I <sub>AV</sub>		40	A

Note : \*1 V<sub>DD</sub>=20V, L=50μH, I<sub>AV</sub>=40A (Fig.1)

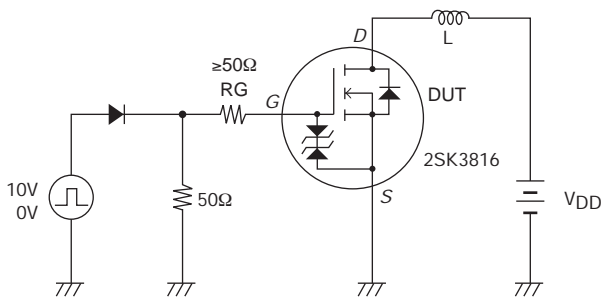
\*2 L≤50μH, single pulse

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.

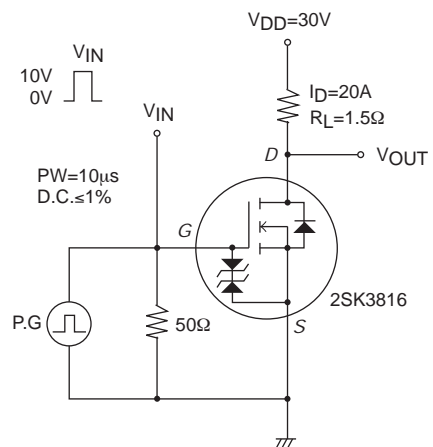
**Electrical Characteristics at Ta=25°C**

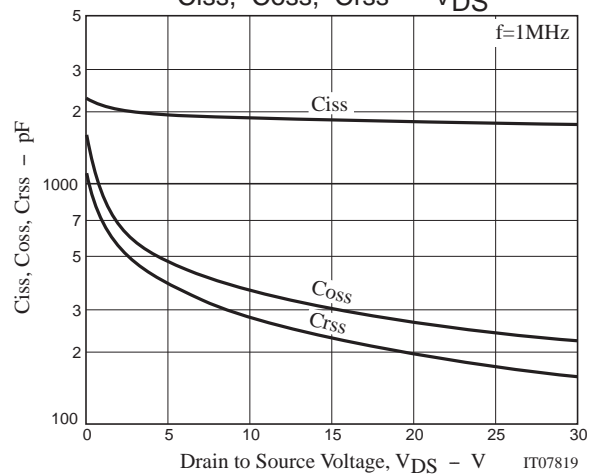
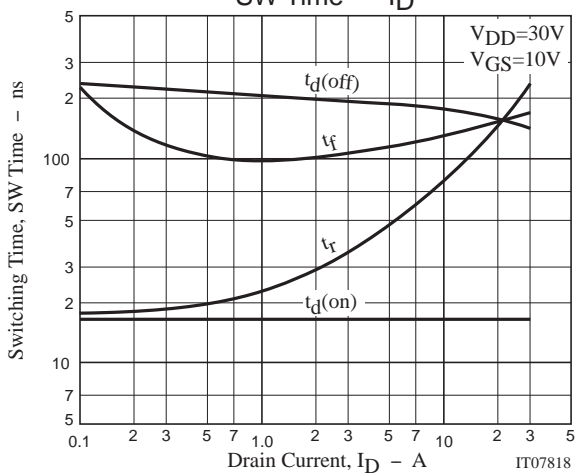
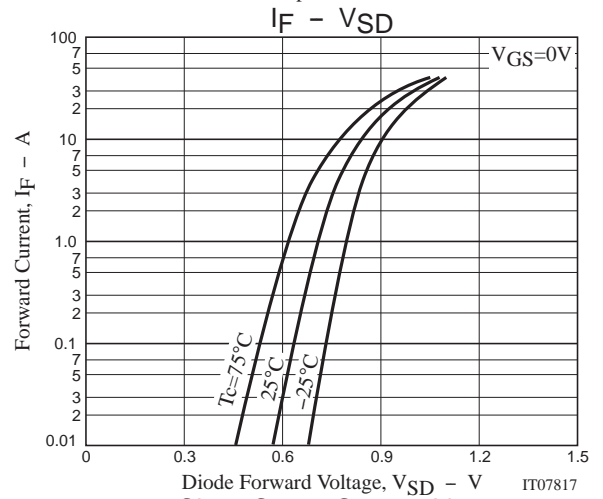
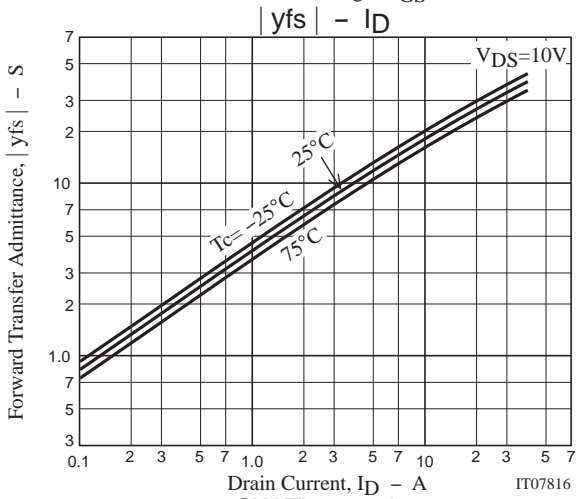
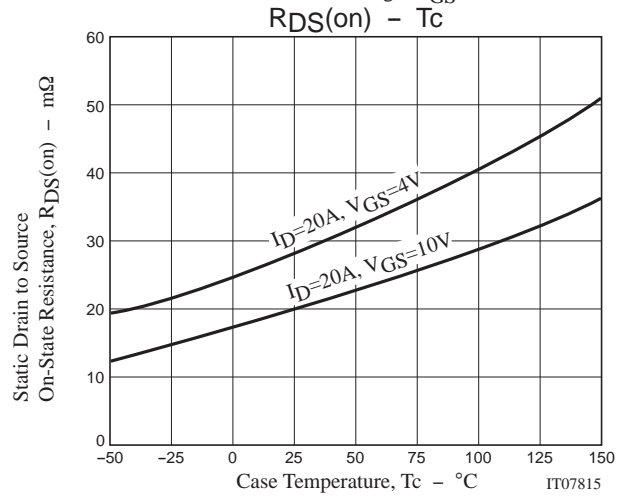
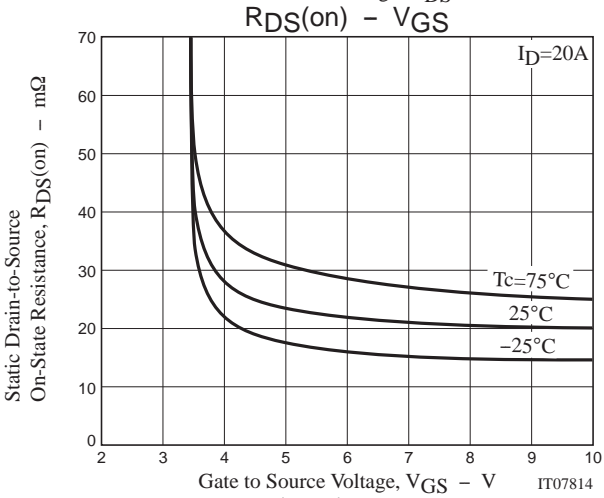
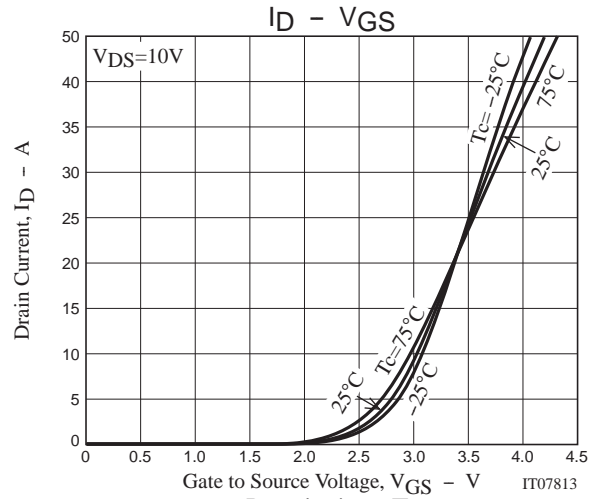
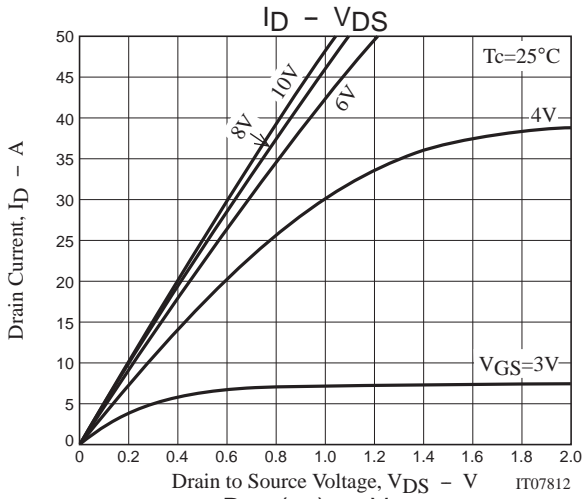
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	V(BR)DSS	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V	60			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μA
Gate to Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±16V, V <sub>DS</sub> =0V			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	1.2		2.6	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =20A	16	27		S
Static Drain to Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =20A, V <sub>GS</sub> =10V		20	26	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =20A, V <sub>GS</sub> =4V		28	40	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, f=1MHz		1780		pF
Output Capacitance	C <sub>oss</sub>			266		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			197		pF
Turn-ON Delay Time	t <sub>d(on)</sub>		See Fig.2		16.5	
Rise Time	t <sub>r</sub>			160		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>			160		ns
Fall Time	t <sub>f</sub>			160		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =40A		40		nC
Gate to Source Charge	Q <sub>gs</sub>			6.5		nC
Gate to Drain "Miller" Charge	Q <sub>gd</sub>			11.5		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =40A, V <sub>GS</sub> =0V		1.05	1.5	V

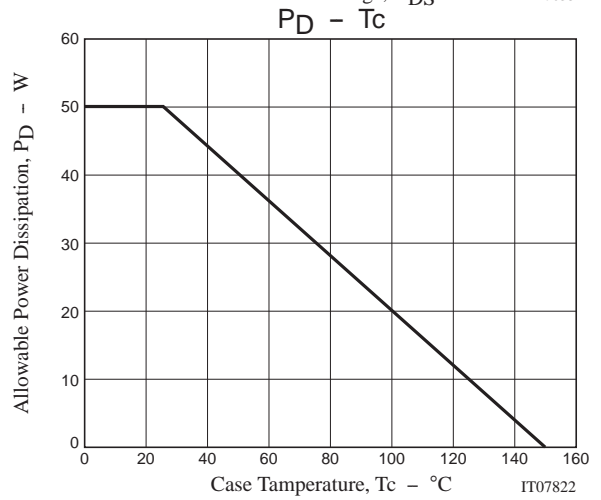
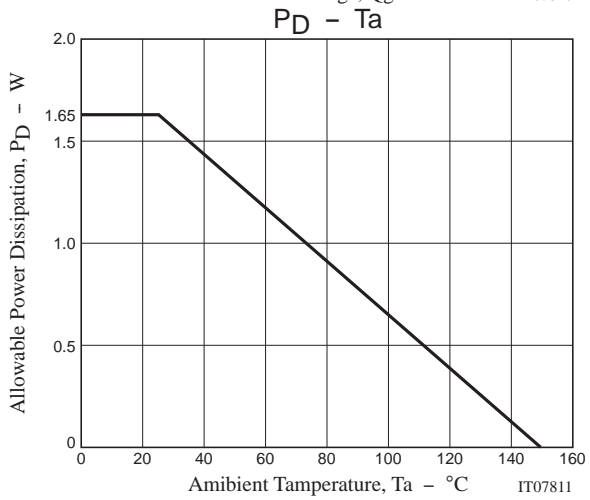
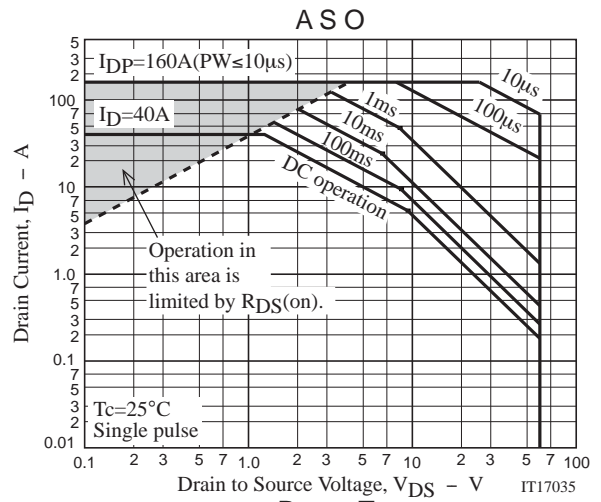
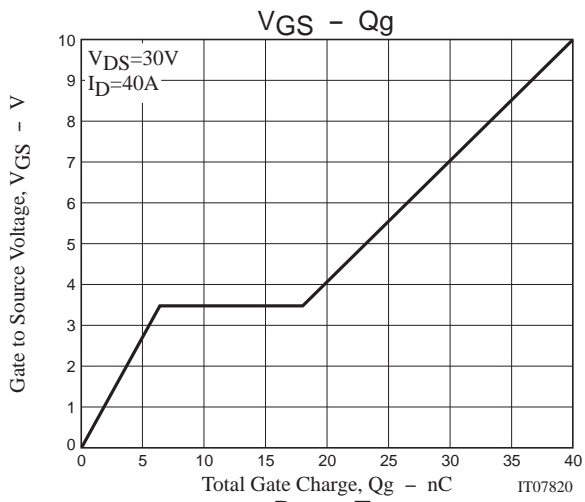
**Fig.1 Unclamped Inductive Switching Test Circuit**



**Fig.2 Switching Time Test Circuit**

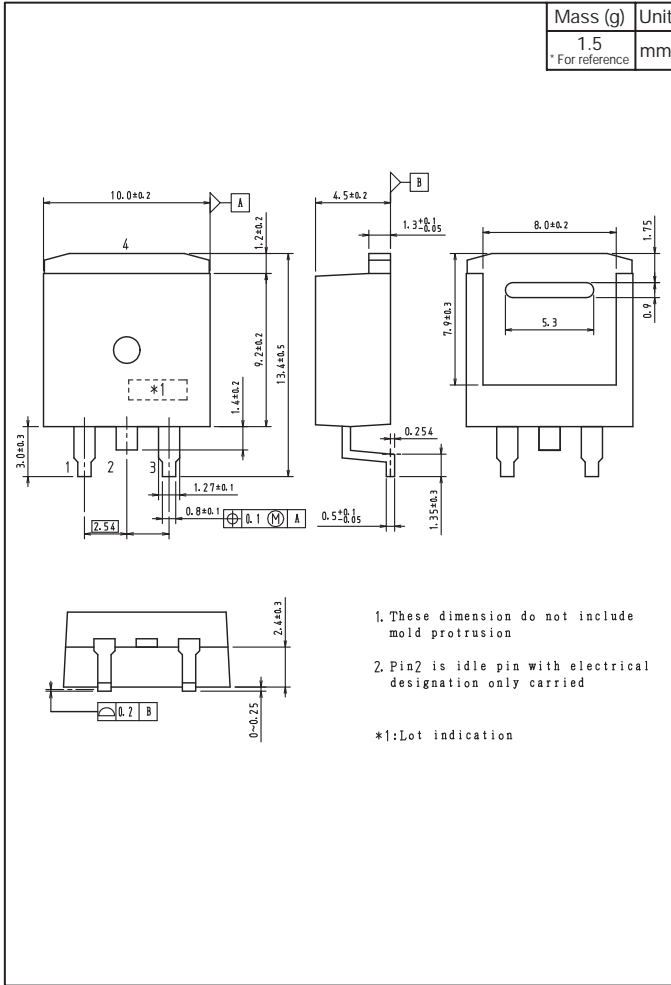




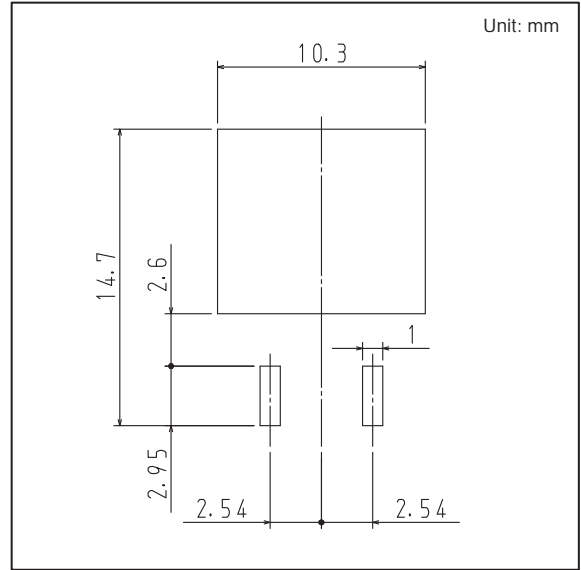


# 2SK3816

## Outline Drawing 2SK3816-DL-1E

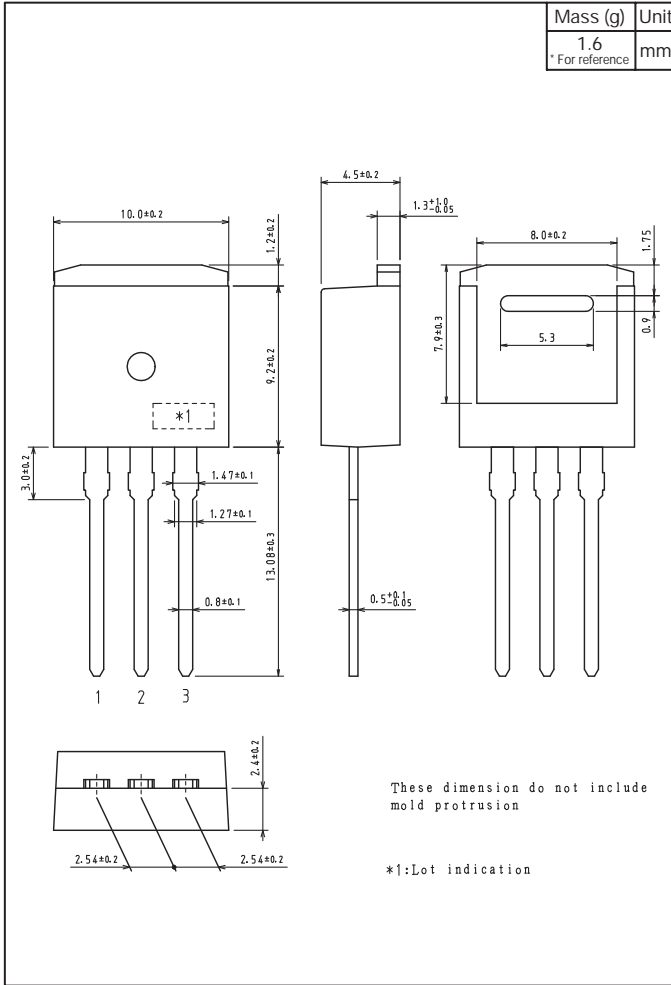


## Land Pattern Example



Outline Drawing

2SK3816-1E



Note on usage : Since the 2SK3816 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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