

SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

DESCRIPTION

The 2SK3458 is N-channel DMOS FET device that features a low gate charge and excellent switching characteristics, designed for high voltage applications such as switching power supply.

FEATURES

- Low gate charge
 $Q_G = 21 \text{ nC TYP. (} V_{BD} = 450 \text{ V, } V_{GS} = 10 \text{ V, } I_D = 6.0 \text{ A)}$
- Gate voltage rating $\pm 30 \text{ V}$
- Low on-state resistance
 $R_{DS(on)} = 2.2 \Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 3.0 \text{ A)}$
- Avalanche capability ratings
- Surface mount package available

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK3458	TO-220AB
2SK3458-S	TO-262
2SK3458-ZJ	TO-263

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

Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	800	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	± 30	V
Drain Current (DC) ($T_C = 25^\circ\text{C}$)	$I_{D(DC)}$	± 6.0	A
Drain Current (pulse) ^{Note1}	$I_{D(pulse)}$	± 18	A
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_{T1}	1.5	W
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_{T2}	100	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Single Avalanche Current ^{Note2}	I_{AS}	6.0	A
Single Avalanche Energy ^{Note2}	E_{AS}	77	mJ

Notes 1. $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1 \%$

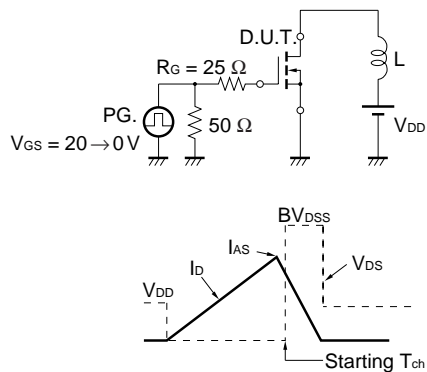
2. Starting $T_{ch} = 25 \text{ }^\circ\text{C}$, $V_{BD} = 150 \text{ V}$, $R_G = 25 \Omega$, $V_{GS} = 20 \text{ V} \rightarrow 0 \text{ V}$

The information contained in this document is being issued in advance of the production cycle for the device. The parameters for the device may change before final production or NEC Corporation, at its own discretion, may withdraw the device prior to its production.
 Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

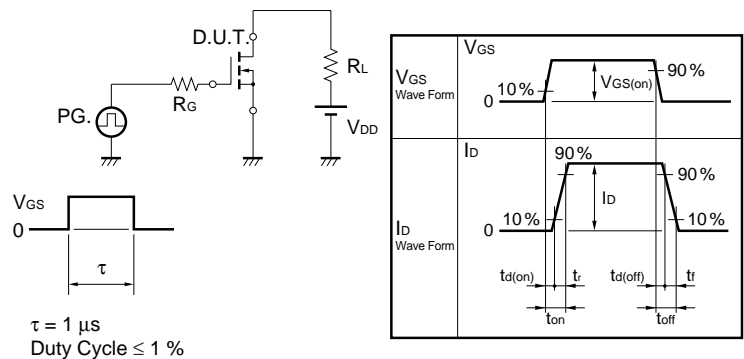
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Leakage Current	I _{DSS}	V _{DS} = 800 V, V _{GS} = 0 V			100	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±30 V, V _{DS} = 0 V			±100	nA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	2.5		3.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 10 V, I _D = 3.0 A	2.5			S
Drain to Source On-state Resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 3.0 A		1.8	2.2	Ω
Input Capacitance	C _{iss}	V _{DS} = 10 V		990		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		170		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		40		pF
Turn-on Delay Time	t _{d(on)}	I _D = 3.0 A		16		ns
Rise Time	t _r	V _{GS(on)} = 10 V		17		ns
Turn-off Delay Time	t _{d(off)}	V _{DD} = 150 V		52		ns
Fall Time	t _f	R _G = 10 Ω		18		ns
Total Gate Charge	Q _G	I _D = 6.0 A		21		nC
Gate to Source Charge	Q _{GS}	V _{DD} = 450 V		5.5		nC
Gate to Drain Charge	Q _{GD}	V _{GS} = 10 V		12		nC
Diode Forward Voltage	V _{F(S-D)}	I _F = 6.0 A, V _{GS} = 0 V		1.0		V
Reverse Recovery Time	t _{rr}	I _F = 6.0 A, V _{GS} = 0 V		630		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 50 A/μs		3.4		μC

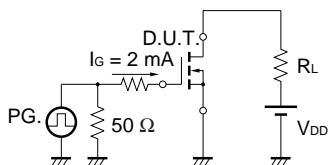
TEST CIRCUIT 1 AVALANCHE CAPABILITY



TEST CIRCUIT 2 SWITCHING TIME

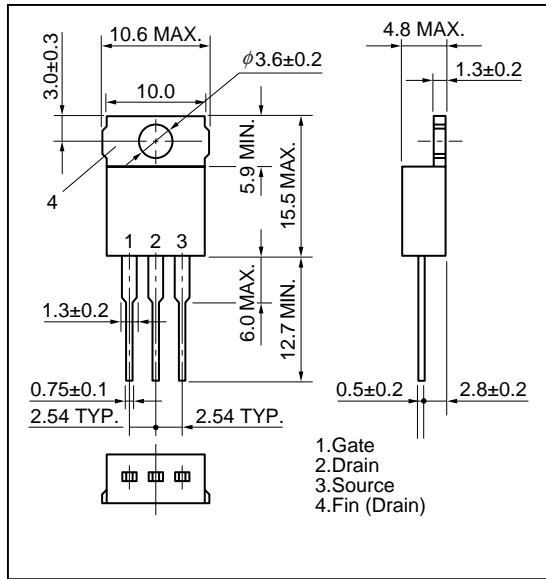


TEST CIRCUIT 3 GATE CHARGE

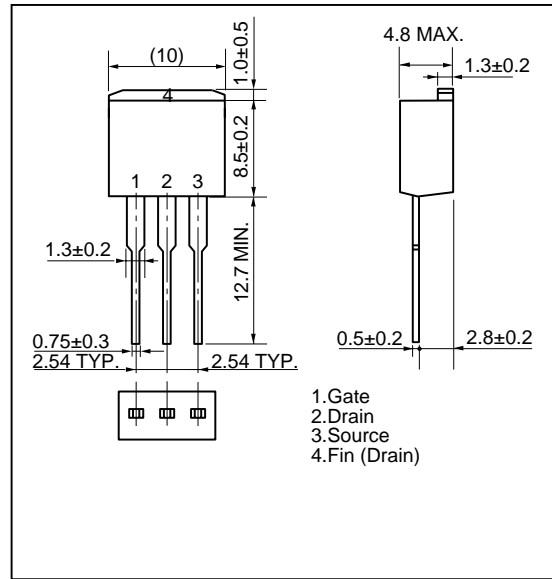


PACKAGE DRAWINGS (Unit : mm)

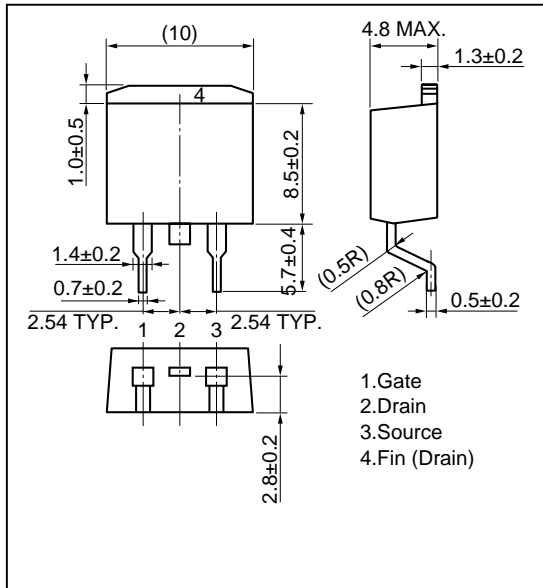
1)TO-220AB (MP-25)



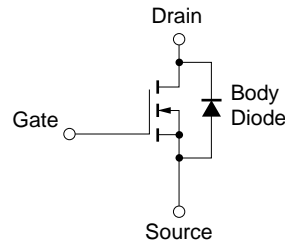
2)TO-262 (MP-25 Fin Cut)



3)TO-263 (MP-25ZJ)



EQUIVALENT CIRCUIT



Remark Strong electric field, when exposed to this device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop generation of static electricity as much as possible, and quickly dissipate it once, when it has occurred.

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