

SWITCHING
N-CHANNEL POWER MOS FET
INDUSTRIAL USE

DESCRIPTION

The 2SK3353 is N-channel MOS Field Effect Transistor designed for high current switching applications.

FEATURES

- Super low on-state resistance:
- ★ $R_{DS(on)1} = 9.5 \text{ m}\Omega \text{ MAX. (}V_{GS} = 10 \text{ V, } I_D = 41 \text{ A)}$
- ★ $R_{DS(on)2} = 14 \text{ m}\Omega \text{ MAX. (}V_{GS} = 4 \text{ V, } I_D = 41 \text{ A)}$
- ★ • Low C_{iss} : $C_{iss} = 4650 \text{ pF TYP.}$
- Built-in gate protection diode

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK3353	TO-220AB
2SK3353-S	TO-262
2SK3353-Z	TO-220SMD

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage	V_{DSS}	60	V
Gate to Source Voltage	$V_{GSS(AC)}$	± 20	V
Drain Current (DC)	$I_D(DC)$	± 82	A
★ Drain Current (pulse) ^{Note1}	$I_D(\text{pulse})$	± 328	A
★ Total Power Dissipation (T _c = 25°C)	P_T	95	W
Total Power Dissipation (T _A = 25°C)	P_T	1.5	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C
★ Single Avalanche Current ^{Note2}	I_{AS}	45	A
★ Single Avalanche Energy ^{Note2}	E_{AS}	202	mJ

Notes 1. PW ≤ 10 μ s, Duty cycle ≤ 1 %

★ 2. Starting $T_{ch} = 25$ °C, $R_G = 25 \Omega$, $V_{GS} = 20$ V → 0 V

THERMAL RESISTANCE

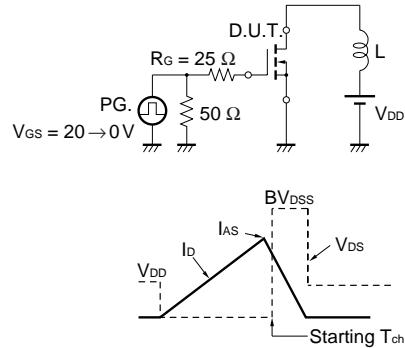
★ Channel to Case	$R_{th}(ch-C)$	1.32	°C/W
Channel to Ambient	$R_{th}(ch-A)$	83.3	°C/W

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 Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

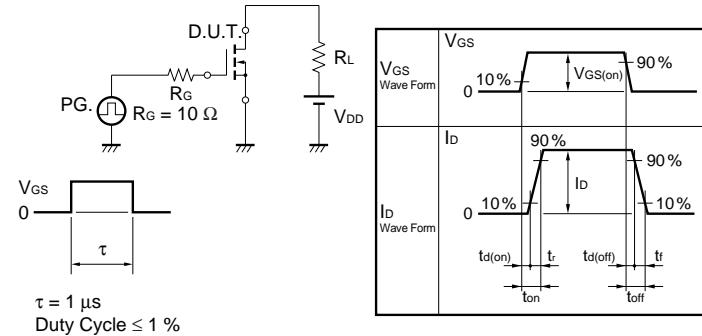
★ ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ C$)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain to Source On-state Resistance	$R_{DS(on)1}$	$V_{GS} = 10V, I_D = 41A$		7.5	9.5	$m\Omega$
	$R_{DS(on)2}$	$V_{GS} = 4V, I_D = 41A$		10.5	14	$m\Omega$
Gate to Source Cut-off Voltage	$V_{GS(off)}$	$V_{DS} = 10V, I_D = 1mA$	1.5	2.0	2.5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = 10V, I_D = 41A$	30	50		S
Drain Leakage Current	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$			10	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 10	μA
Input Capacitance	C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		4650		pF
	C_{oss}			780		pF
	C_{rss}			380		pF
Turn-on Delay Time	$t_{d(on)}$	$I_D = 41A, V_{GS(on)} = 10V, V_{DD} = 30V, R_G = 10\Omega$	100			ns
Rise Time	t_r		1550			ns
Turn-off Delay Time	$t_{d(off)}$		280			ns
Fall Time	t_f		420			ns
Total Gate Charge	Q_G	$I_D = 82A, V_{DD} = 48V, V_{GS} = 10V$	90			nC
Gate to Source Charge	Q_{GS}		14			nC
Gate to Drain Charge	Q_{GD}		38			nC
Body Diode Forward Voltage	$V_{F(S-D)}$	$I_F = 82A, V_{GS} = 0V$	1.0			V
Reverse Recovery Time	t_{rr}	$I_F = 82A, V_{GS} = 0V, di/dt = 100A/\mu s$	60			ns
Reverse Recovery Charge	Q_{rr}		110			nC

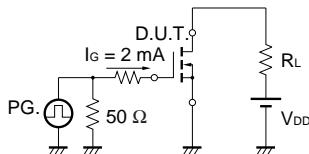
TEST CIRCUIT 1 AVALANCHE CAPABILITY



TEST CIRCUIT 2 SWITCHING TIME

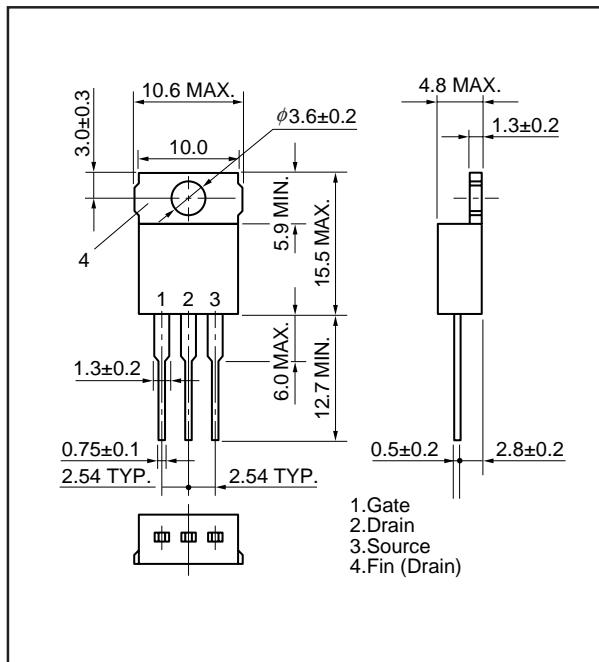


TEST CIRCUIT 3 GATE CHARGE

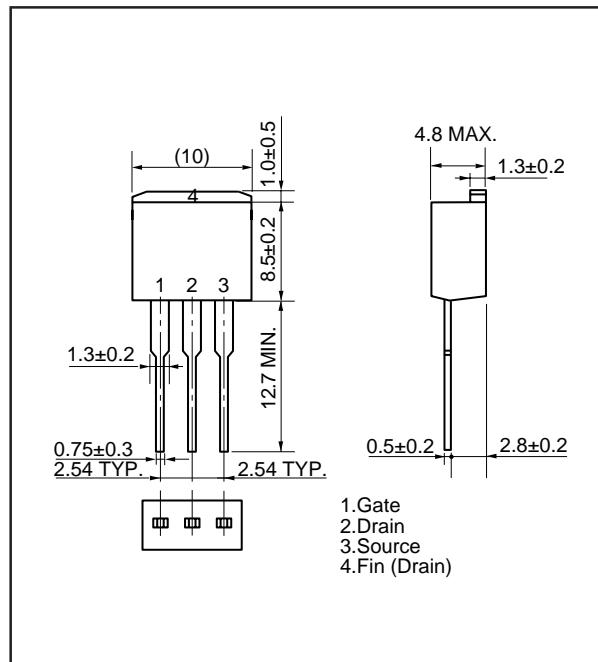


PACKAGE DRAWING (Unit: mm)

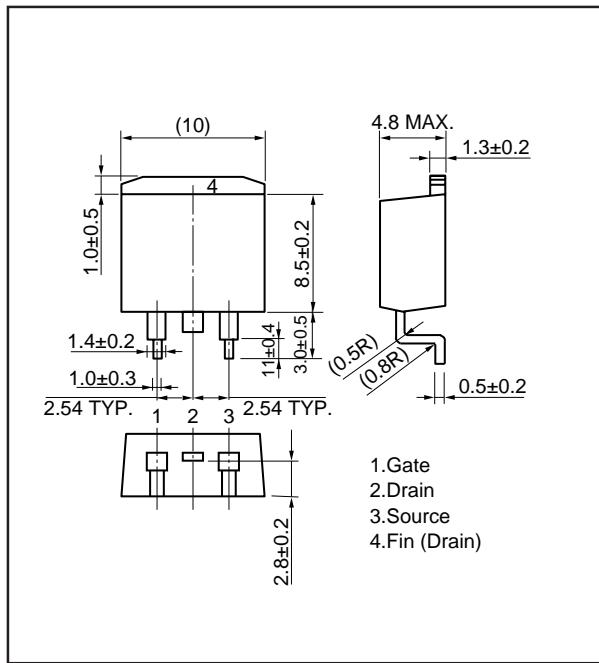
1) TO-220AB (MP-25)



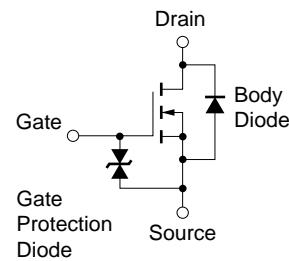
2) TO-262 (MP-25 Fin Cut)



3) TO-220SMD (MP-25Z)



EQUIVALENT CIRCUIT



Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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