

MOS FIELD EFFECT TRANSISTOR

2SK3467

SWITCHING

N-CHANNEL POWER MOS FET

INDUSTRIAL USE

DESCRIPTION

The 2SK3467 is N-Channel MOS FET device that features a low on-state resistance and excellent switching characteristics, designed for low voltage high current applications such as DC/DC converter with synchronous rectifier.

FEATURES

- 4.5 V drive available
- Low on-state resistance
 $R_{DS(on)1} = 6.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 40 \text{ A)}$
- Low gate charge
 $Q_G = 55 \text{ nC TYP. (} I_D = 80 \text{ A, } V_{DD} = 16 \text{ V, } V_{GS} = 10 \text{ V)}$
- Built-in gate protection diode
- Surface mount device available

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

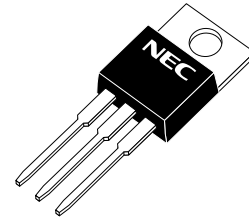
| | | | |
|--|----------------|-------------|------------------|
| Drain to Source Voltage ($V_{GS} = 0 \text{ V}$) | V_{DSS} | 20 | V |
| Gate to Source Voltage ($V_{DS} = 0 \text{ V}$) | V_{GSS} | ± 20 | V |
| Drain Current (DC) ($T_C = 25^\circ\text{C}$) | $I_{D(DC)}$ | ± 80 | A |
| Drain Current (Pulse) ^{Note} | $I_{D(pulse)}$ | ± 320 | 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} | 76 | W |
| Channel Temperature | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

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

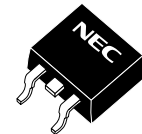
ORDERING INFORMATION

| PART NUMBER | PACKAGE |
|-------------|-----------------|
| 2SK3467 | TO-220AB |
| 2SK3467-ZK | TO-263(MP-25ZK) |

(TO-220AB)



(TO-263)

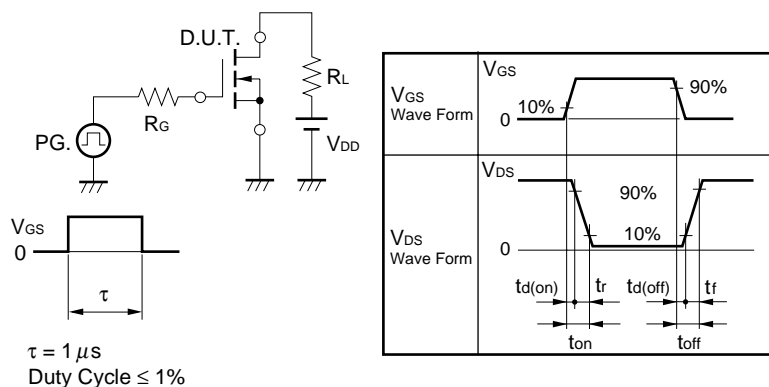


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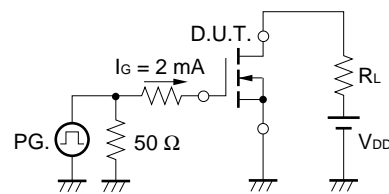
ELECTRICAL CHARACTERISTICS(T_A = 25°C)

| CHARACTERISTICS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------|----------------------|--|------|------|------|------|
| Zero Gate voltage Drain Current | I _{DSS} | V _{DS} = 20 V, V _{GS} = 0 V | | | 10 | μA |
| Gate Leakage Current | I _{GSS} | V _{GS} = ±20 V, V _{DS} = 0 V | | | ±10 | μA |
| Gate Cut-off Voltage | V _{GS(off)} | V _{DS} = 10 V, I _D = 1 mA | 1.5 | | 2.5 | V |
| Forward Transfer Admittance | y _{fs} | V _{DS} = 10 V, I _D = 40 A | 20 | | | S |
| Drain to Source On-state Resistance | R _{DS(on)1} | V _{GS} = 10 V, I _D = 40 A | | 4.8 | 6.0 | mΩ |
| | R _{DS(on)2} | V _{GS} = 4.5 V, I _D = 40 A | | 6.7 | 9.5 | mΩ |
| Input Capacitance | C _{iss} | V _{DS} = 10 V | | 2800 | | pF |
| Output Capacitance | C _{oss} | V _{GS} = 0 V | | 1200 | | pF |
| Reverse Transfer Capacitance | C _{rss} | f = 1 MHz | | 600 | | pF |
| Turn-on Delay Time | t _{d(on)} | V _{DD} = 10 V, I _D = 40 A | | 16 | | ns |
| Rise Time | t _r | V _{GS(on)} = 10 V | | 23 | | ns |
| Turn-off Delay Time | t _{d(off)} | R _G = 10 Ω | | 74 | | ns |
| Fall Time | t _f | | | 31 | | ns |
| Total Gate Charge | Q _G | V _{DD} = 16 V | | 55 | | nC |
| Gate to Source Charge | Q _{GS} | V _{GS} = 10 V | | 9 | | nC |
| Gate to Drain Charge | Q _{GD} | I _D = 80 A | | 17 | | nC |
| Body Diode Forward Voltage | V _{F(S-D)} | I _F = 80 A, V _{GS} = 0 V | | 1.0 | | V |
| Reverse Recovery Time | t _{rr} | I _F = 80 A, V _{GS} = 0 V | | 44 | | ns |
| Reverse Recovery Charge | Q _{rr} | di/dt = 100 A/μs | | 40 | | nC |

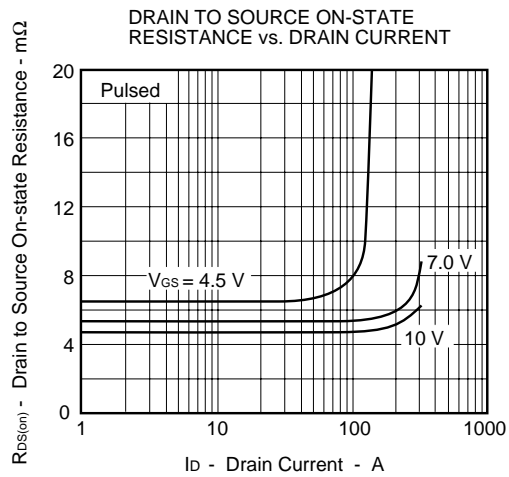
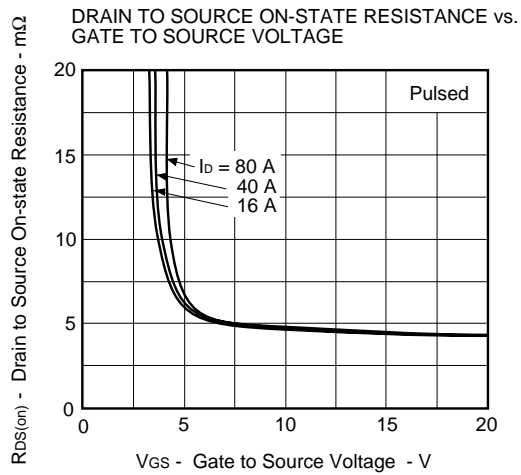
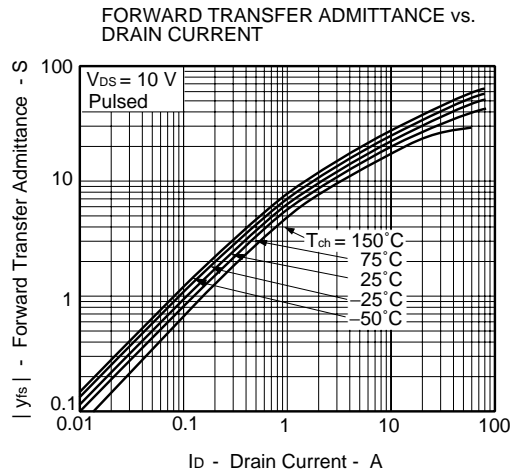
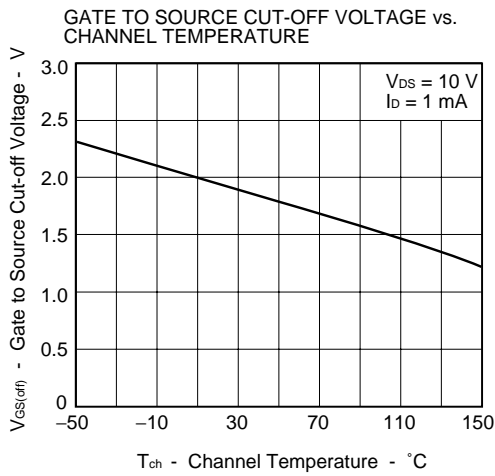
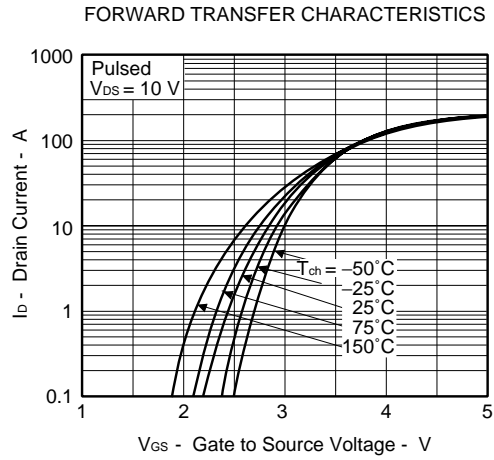
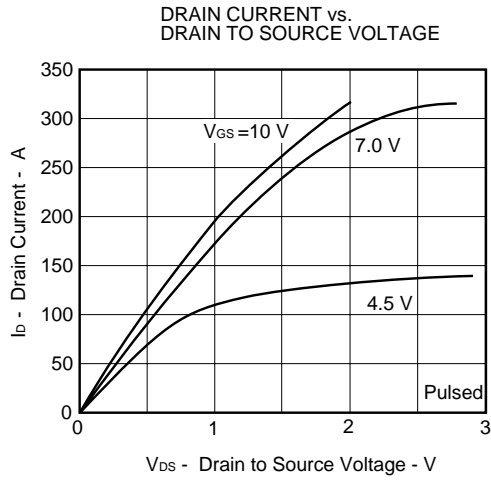
TEST CIRCUIT 1 SWITCHING TIME



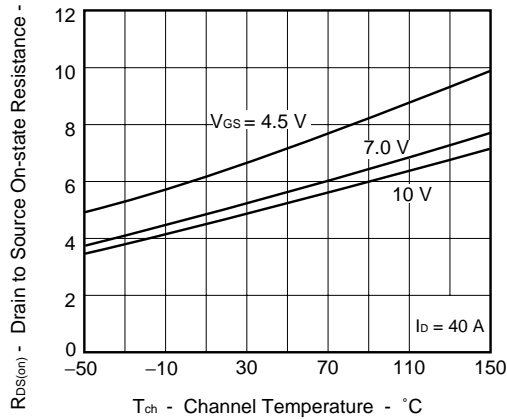
TEST CIRCUIT 2 GATE CHARGE



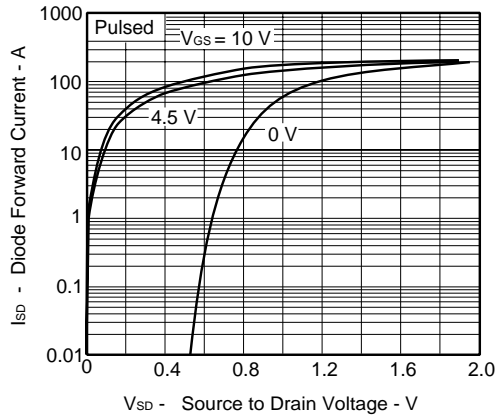
TYPICAL CHARACTERISTICS (T_A = 25°C)



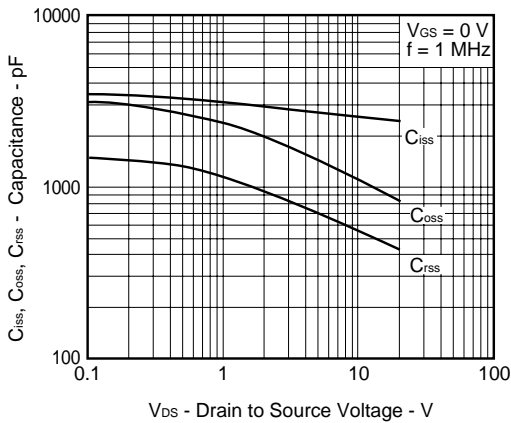
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



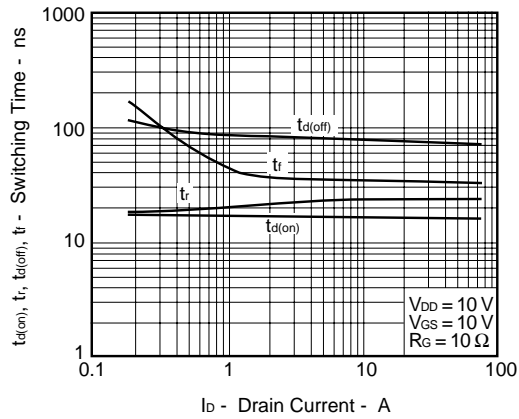
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



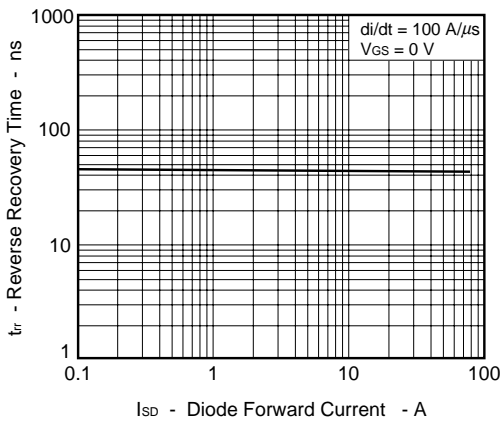
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



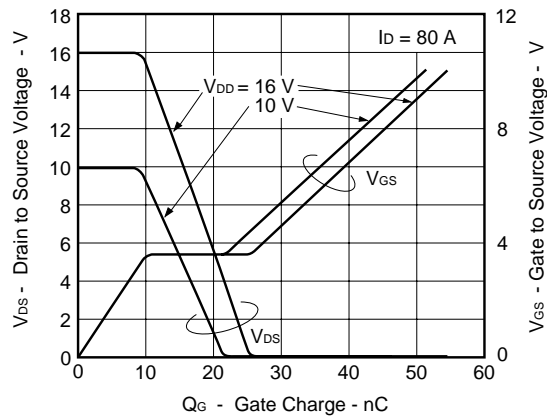
SWITCHING CHARACTERISTICS

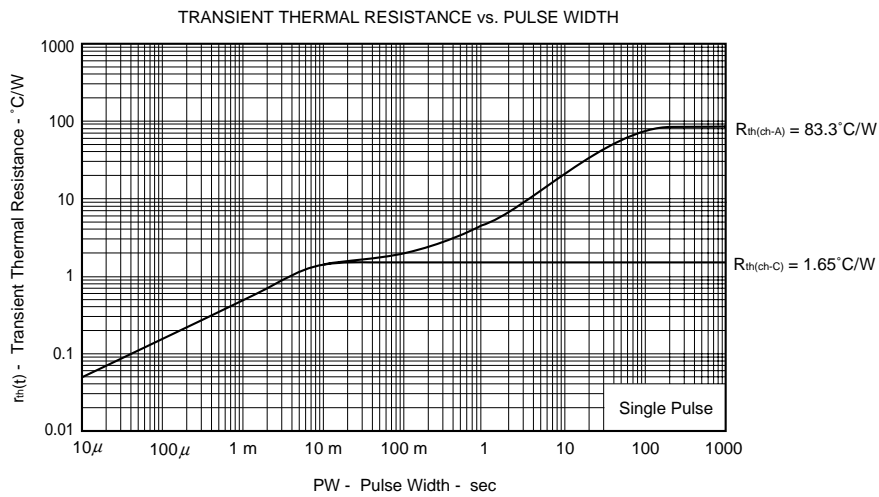
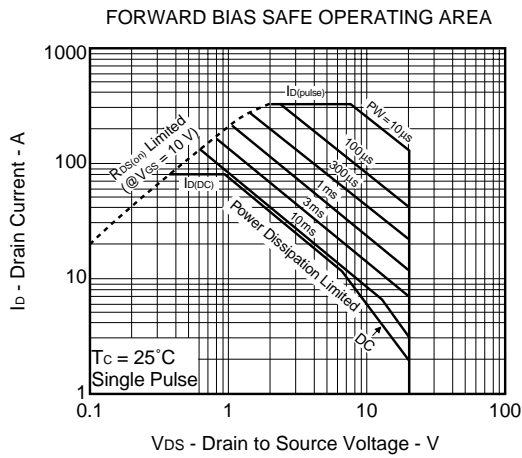
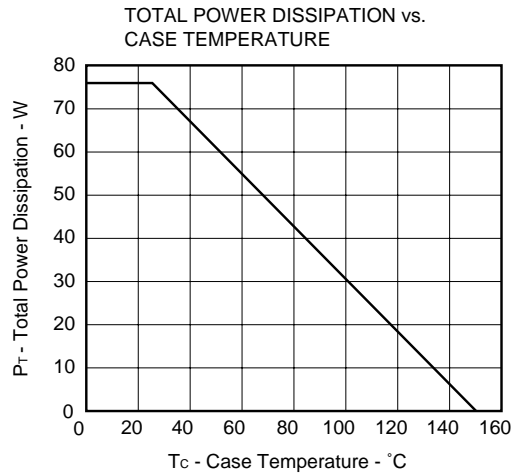
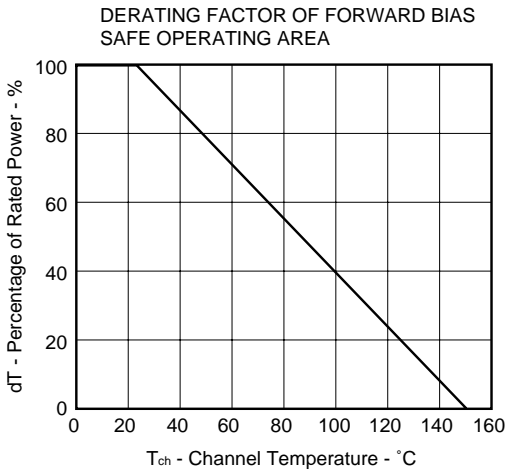


REVERSE RECOVERY TIME vs. DIODE FORWARD CURRENT



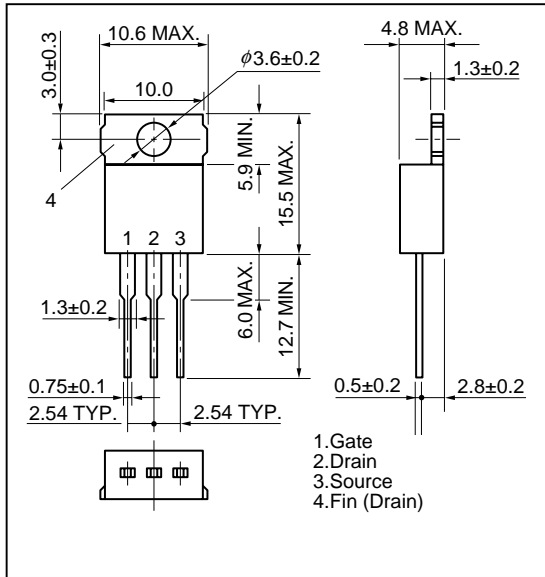
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



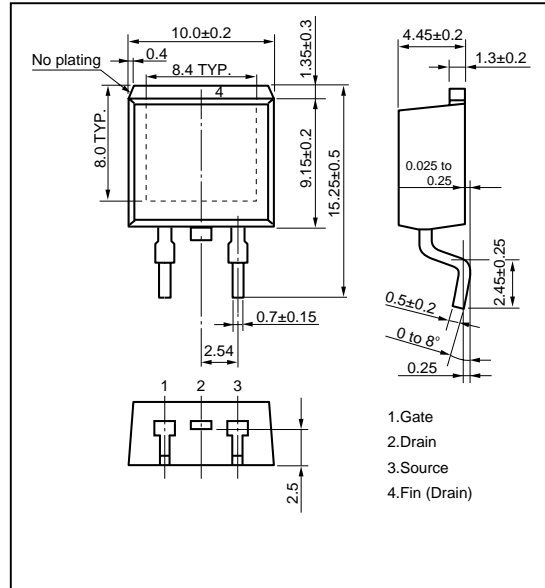


PACKAGE DRAWINGS (Unit : mm)

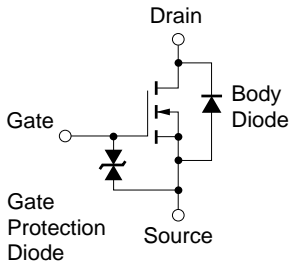
1)TO-220AB (MP-25)



2)TO-263 (MP-25ZK)



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.

[MEMO]

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