

SWITCHING  
N-CHANNEL POWER MOS FET  
INDUSTRIAL USE

## DESCRIPTION

The 2SK2484 is N-Channel MOS Field Effect Transistor designed for high voltage switching applications.

## FEATURES

- Low On-Resistance  
 $R_{DS(on)} = 2.8 \Omega$  ( $V_{GS} = 10$  V,  $I_D = 3.0$  A)
- Low  $C_{iss}$   $C_{iss} = 1\,200$  pF TYP.
- High Avalanche Capability Ratings

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25$  °C)

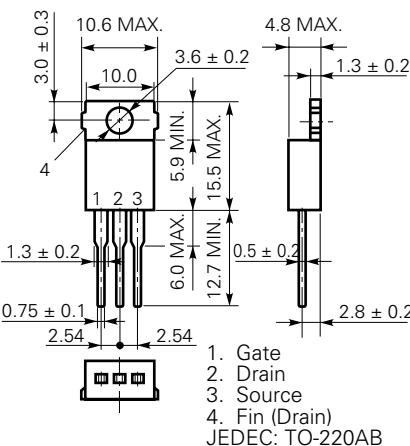
Drain to Source Voltage	$V_{DSS}$	900	V
Gate to Source Voltage	$V_{GSS}$	$\pm 30$	V
Drain Current (DC)	$I_D(DC)$	$\pm 5.0$	A
Drain Current (pulse)*	$I_D(pulse)$	$\pm 10$	A
Total Power Dissipation ( $T_c = 25$ °C)	$P_{T1}$	75	W
Total Power Dissipation ( $T_A = 25$ °C)	$P_{T2}$	1.5	W
Channel Temperature	$T_{ch}$	150	°C
Storage Temperature	$T_{stg}$	-55 to +150	°C
Single Avalanche Current**	$I_{AS}$	5.0	A
Single Avalanche Energy**	$E_{AS}$	75	mJ

\* PW  $\leq 10 \mu s$ , Duty Cycle  $\leq 1\%$

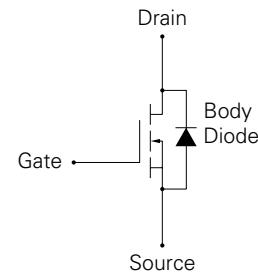
\*\* Starting  $T_{ch} = 25$  °C,  $R_G = 25 \Omega$ ,  $V_{GS} = 20$  V  $\rightarrow 0$

## PACKAGE DIMENSIONS

(in millimeters)



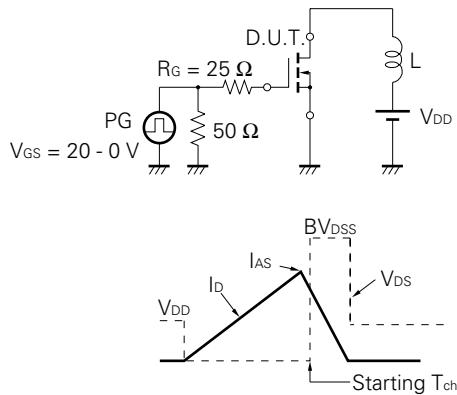
## MP-25 (TO-220)



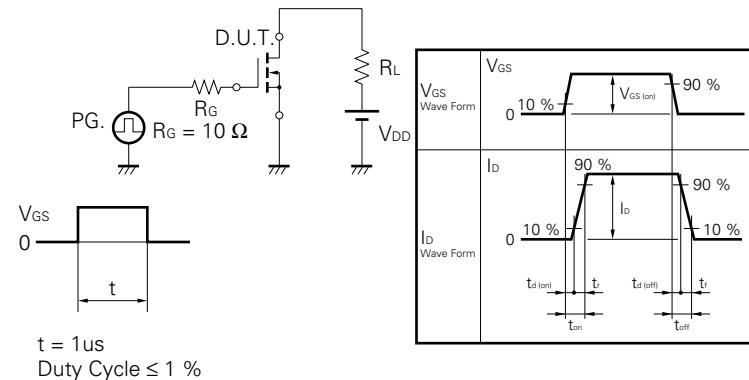
## ELECTRICAL CHARACTERISTICS (TA = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-State Resistance	$R_{DS(on)}$		2.2	2.8	$\Omega$	$V_{GS} = 10$ V, $I_D = 3.0$ A
Gate to Source Cutoff Voltage	$V_{GS(off)}$	2.5		3.5	V	$V_{DS} = 10$ V, $I_D = 1$ mA
Forward Transfer Admittance	$ y_{fs} $	2.0			S	$V_{DS} = 20$ V, $I_D = 3.0$ A
Drain Leakage Current	$I_{DSS}$			100	$\mu$ A	$V_{DS} = V_{DSS}$ , $V_{GS} = 0$
Gate to Source Leakage Current	$I_{GS}$			$\pm 100$	nA	$V_{GS} = \pm 30$ V, $V_{DS} = 0$
Input Capacitance	$C_{iss}$		1 200		pF	$V_{DS} = 10$ V
Output Capacitance	$C_{oss}$		170		pF	$V_{GS} = 0$
Reverse Transfer Capacitance	$C_{rss}$		30		pF	$f = 1$ MHz
Turn-On Delay Time	$t_{d(on)}$		20		ns	$I_D = 3.0$ A
Rise Time	$t_r$		10		ns	$V_{GS} = 10$ V
Turn-Off Delay Time	$t_{d(off)}$		70		ns	$V_{DD} = 150$ V
Fall Time	$t_f$		15		ns	$R_G = 10 \Omega$
Total Gate Charge	$Q_G$		40		nC	$I_D = 5.0$ A
Gate to Source Charge	$Q_{GS}$		7		nC	$V_{DD} = 450$ V
Gate to Drain Charge	$Q_{GD}$		17		nC	$V_{GS} = 10$ V
Body Diode Forward Voltage	$V_{F(S-D)}$		1.0		V	$I_F = 5.0$ A, $V_{GS} = 0$
Reverse Recovery Time	$t_{rr}$		670		ns	$I_F = 5.0$ A, $V_{GS} = 0$
Reverse Recovery Charge	$Q_{rr}$		3.5		$\mu$ C	$di/dt = 50$ A/ $\mu$ s

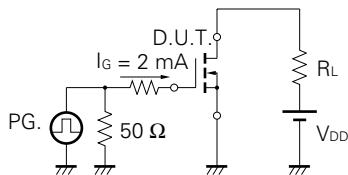
## Test Circuit 1 Avalanche Capability



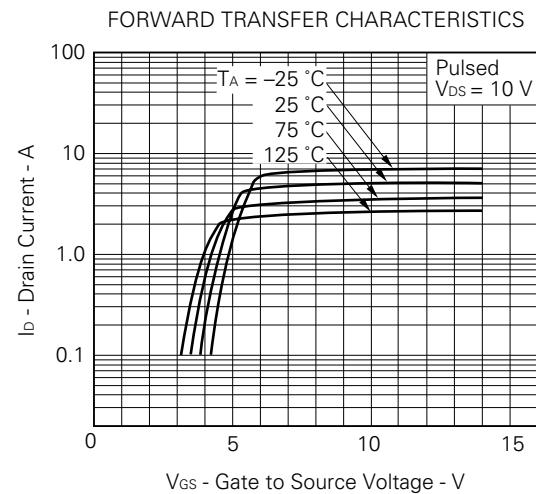
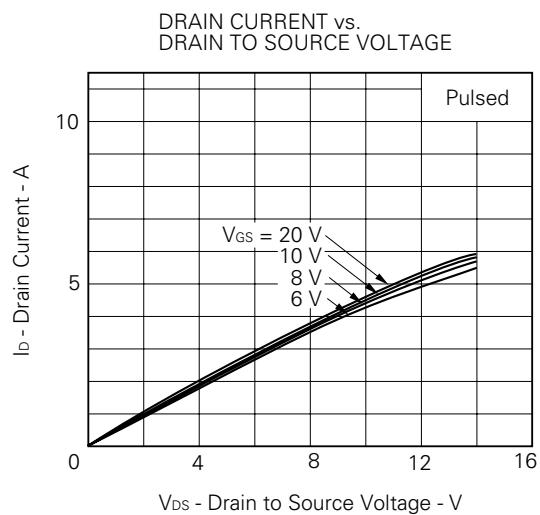
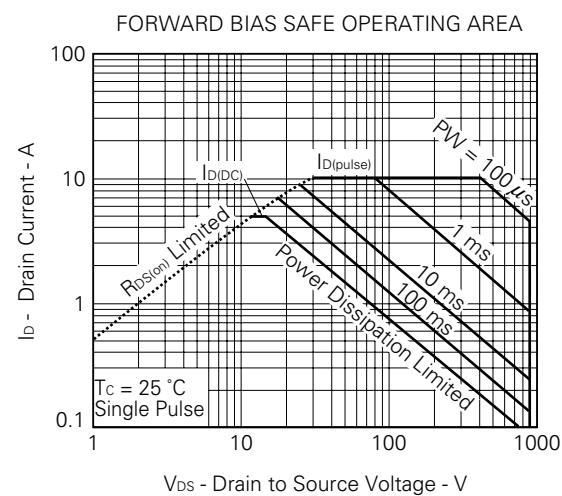
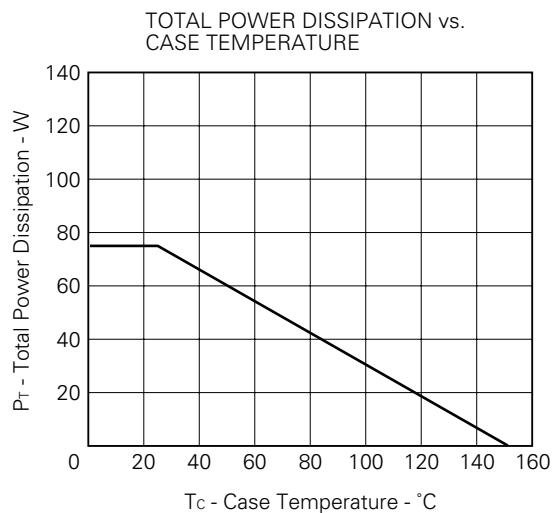
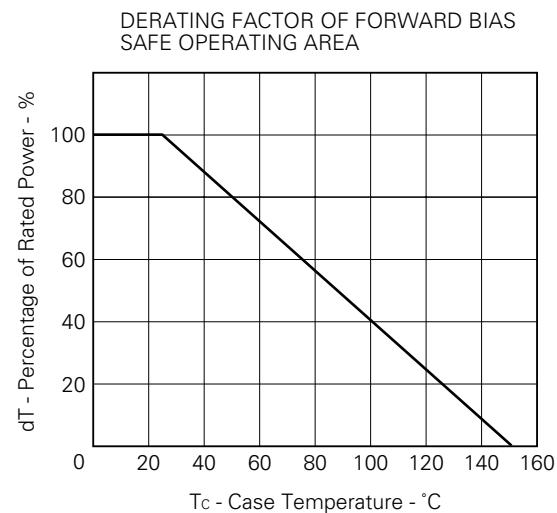
## Test Circuit 2 Switching Time



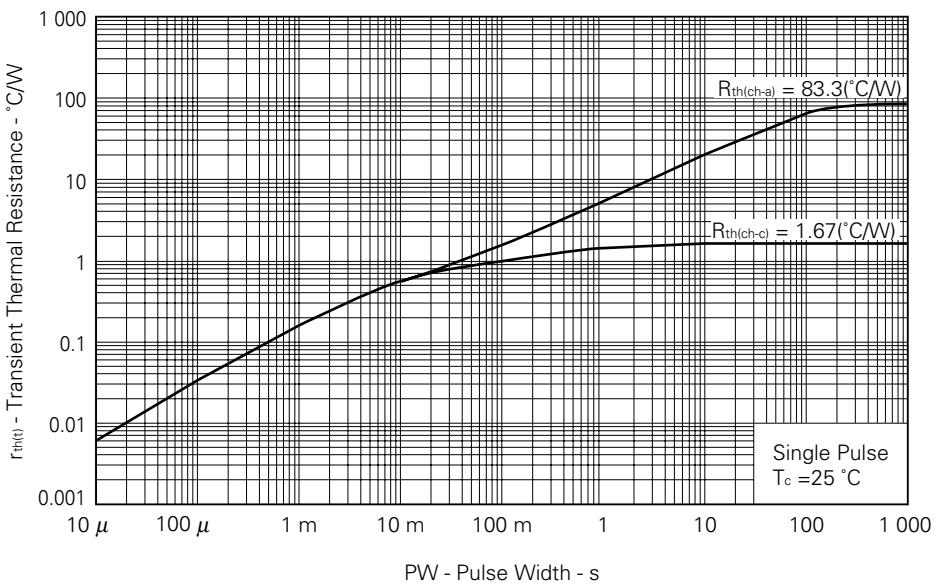
## Test Circuit 3 Gate Charge



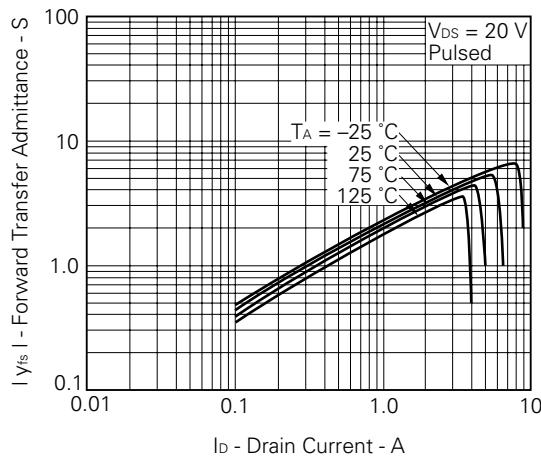
The application circuits and their parameters are for references only and are not intended for use in actual design-in's.

TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

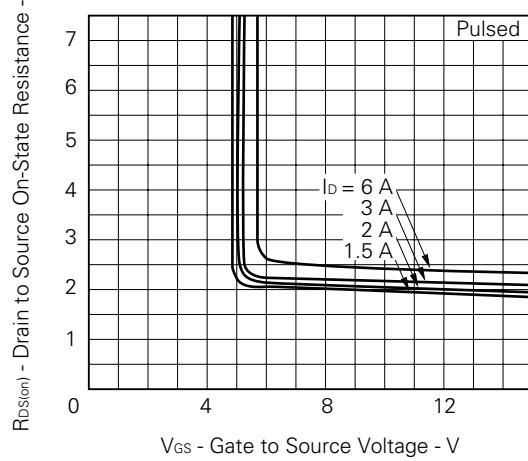
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



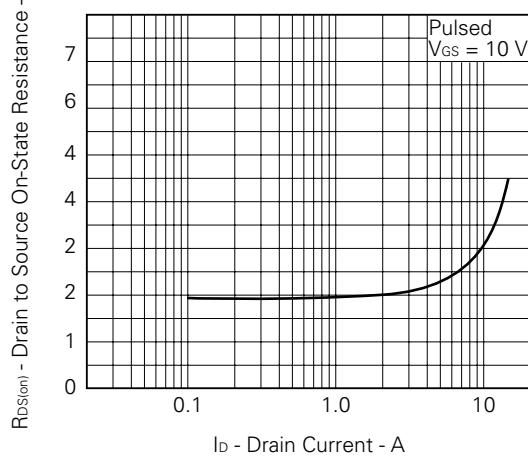
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



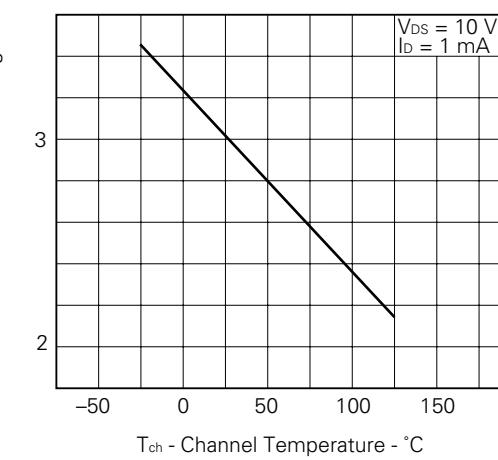
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE

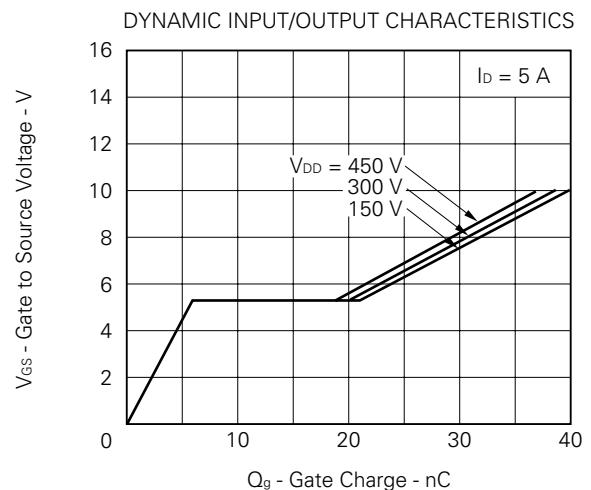
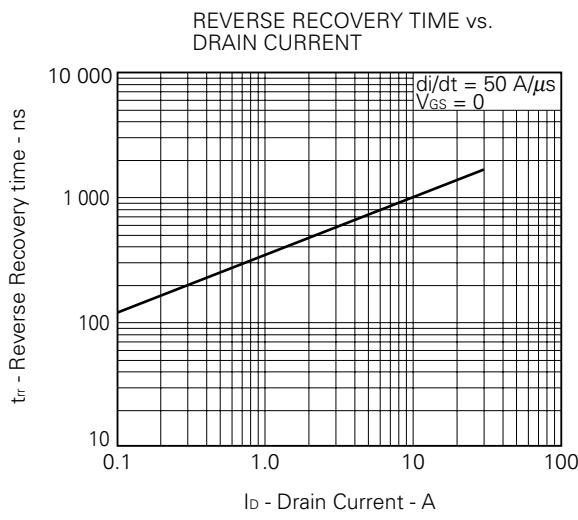
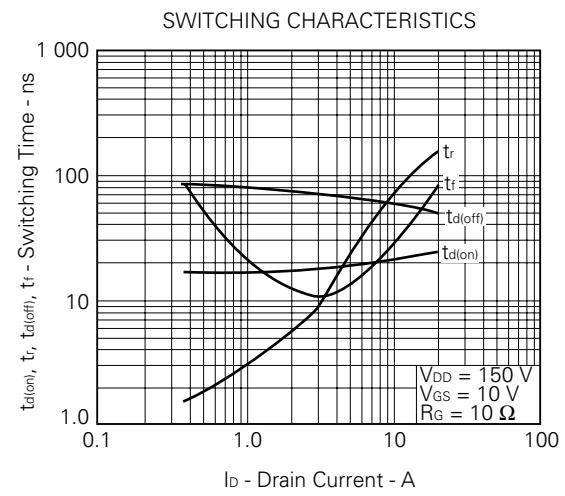
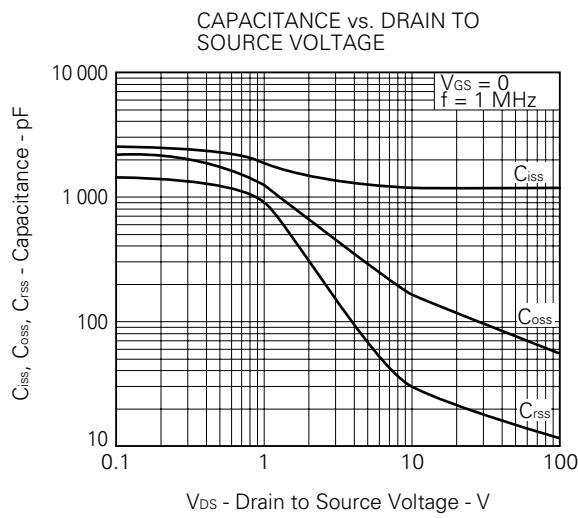
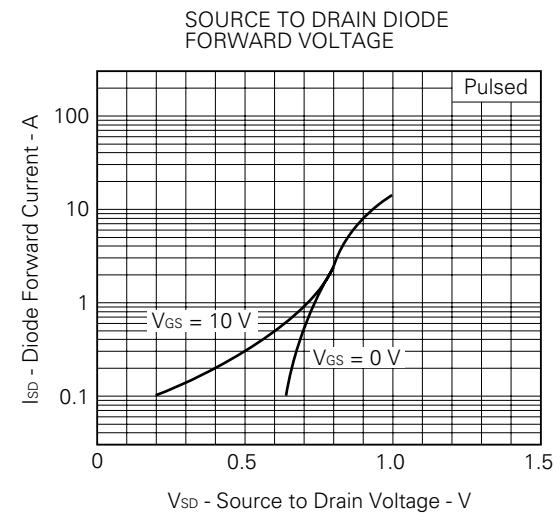
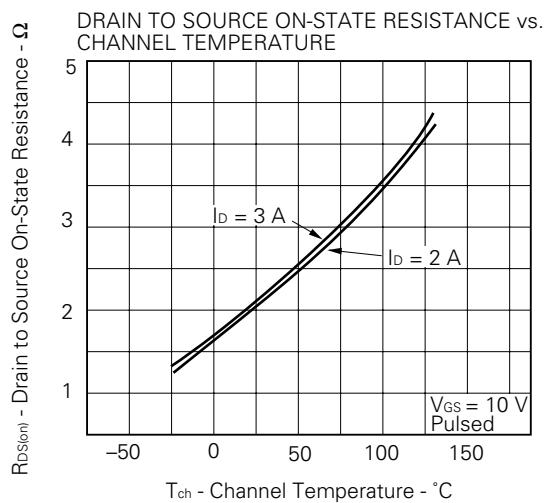


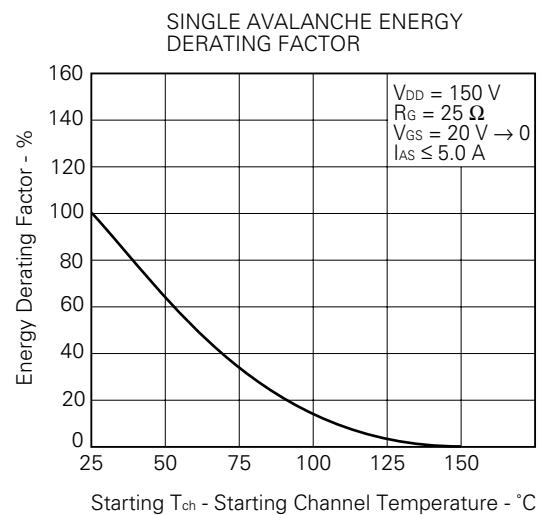
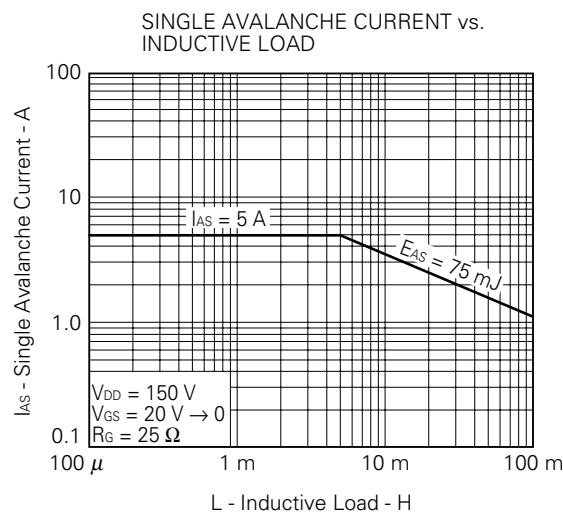
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE







**REFERENCE**

Document Name	Document No.
NEC semiconductor device reliability/quality control system.	TEI-1202
Quality grade on NEC semiconductor devices.	IEI-1209
Semiconductor device mounting technology manual.	IEI-1207
Semiconductor device package manual.	IEI-1213
Guide to quality assurance for semiconductor devices.	MEI-1202
Semiconductor selection guide.	MF-1134
Power MOS FET features and application switching power supply.	TEA-1034
Application circuits using Power MOS FET.	TEA-1035
Safe operating area of Power MOS FET.	TEA-1037

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