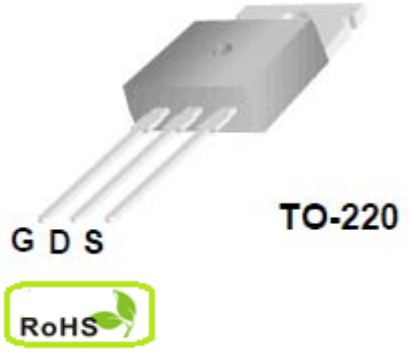
SKD456T

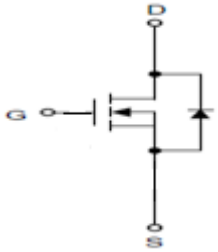
40V N-Channel MOSFET

■ FEATURES

- 40V/175A[3]
  RDS(ON)= 3.2m**Ω typ@** VGS=10V
- Lead free and Green Device Available
- Low Rds-on to Minimize Conductive Loss
- High avalanche Current

■ PIN DESCRIPTION





■ Application

- Power Supply
- Power Tool
- Load Switch Control

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Symbol	Parameter		Maximum	Unit
V_{DSS}	Drain-to-Source Voltage		40	V
V_{GSS}	Gate-to-Source Voltage		±20	V
I_D[3]	Continuous Drain Current	T_C=25°C	175	A
		T_C=100°C	120	
I_{DP}[4]	Pulsed Drain Current	T_C=25°C	175	
IAS[5]	Avalanche Current		48	
EAS[5]	Avalanche energy		800	mJ
PD	Maximum Power Dissipation	T_C=25°C	190	W
		T_C=100°C	95	
T_J, T_{STG}	Junction & Storage Temperature Range		-55~175	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
Rθjc	Thermal Resistance-Junction to Case	0.78	°C/W
Rθja	Thermal Resistance-Junction to Ambient	62.5	

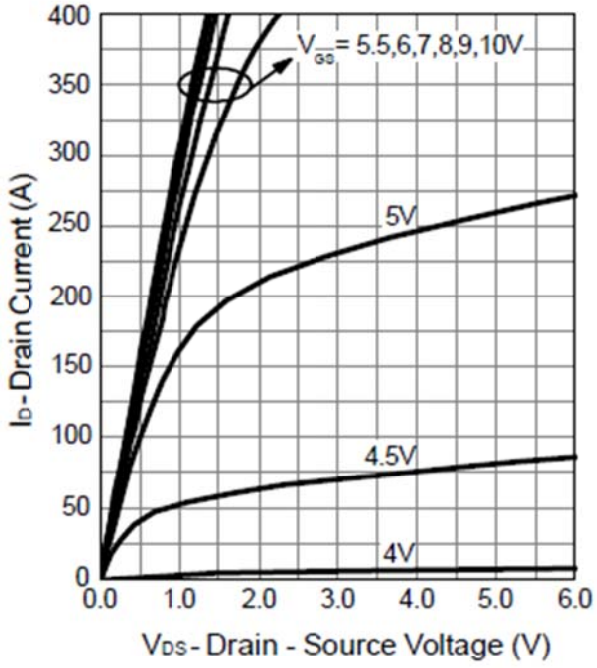
Electrical Characteristics (TA=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	40	—	—	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=32V,V_{GS}=0V	—	—	1	uA
		T_J=125°C	—	—	10	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	2	3	4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	—	—	±100	nA
$R_{DS(on)}$[1]	Drain-Source On-Resistance	V_{GS}=10V, I_D=60A		3.2	4	mΩ
			—	—	—	
Diode Characteristics						
V_{SD}[1]	Diode Forward Voltage	I_{SD}=60A,V_{GS}=0V	—	—	1.3	V
I_S[3]	Diode Continuous Forward Current		—	—	175	A
t_{rr}	Reverse Recovery Time	I_F=60A, dI/dt=100A/us	—	28	—	nS
Q_{rr}	Reverse Recovery Charge		—	51	—	nC
Dynamic Characteristics[2]						
R_G	Gate Resistance	V_{GS}=0V, V_{DS}=0V, Frequency=1MHz	—	1.2	—	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V Frequency=1MHz	—	4450	—	pF
C_{oss}	Output Capacitance		—	1020	—	
C_{rss}	Reverse Transfer Capacitance		—	530	—	
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V,I_D=60A, V_{GS}=10V,R_G=6Ω	—	28	—	nS
t_r	Turn-On Rise Time		—	18	—	
$t_{d(off)}$	Turn-Off Delay Time		—	42	—	
t_f	Turn-Off Fall Time		—	54	—	
Gate Charge Characteristics[2]						
Q_g	Total Gate Charge	V_{DS}=32V,V_{GS}=10V I_D=60A	—	120	—	nC
Q_{gs}	Gate-to-Source Charge		—	29	—	
Q_{gd}	Gate-to-Drain Charge		—	35	—	

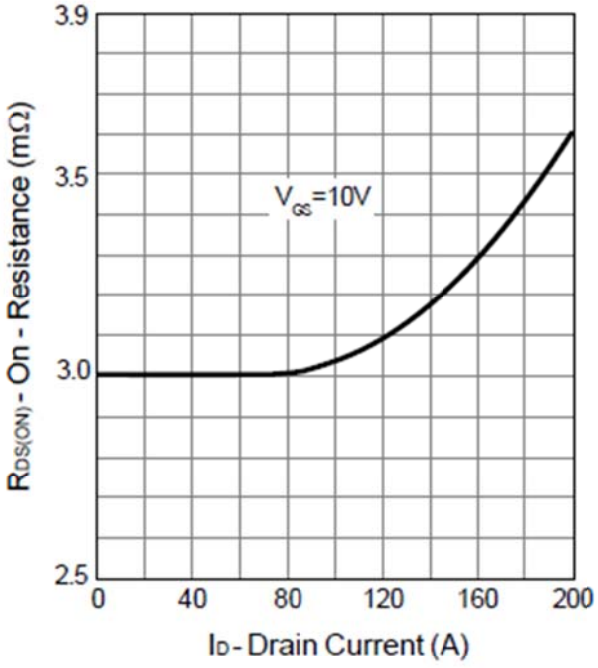
Note: 1: Pulse test; pulse width ≦ 300us, duty cycle ≦ 2%.
2: Guaranteed by design, not subject to production testing.
3: Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 55A.
4: Repetitive rating, pulse width limited by max junction temperature.
5: Starting TJ = 25°C,L = 0.3mH

Typical Operating Characteristics

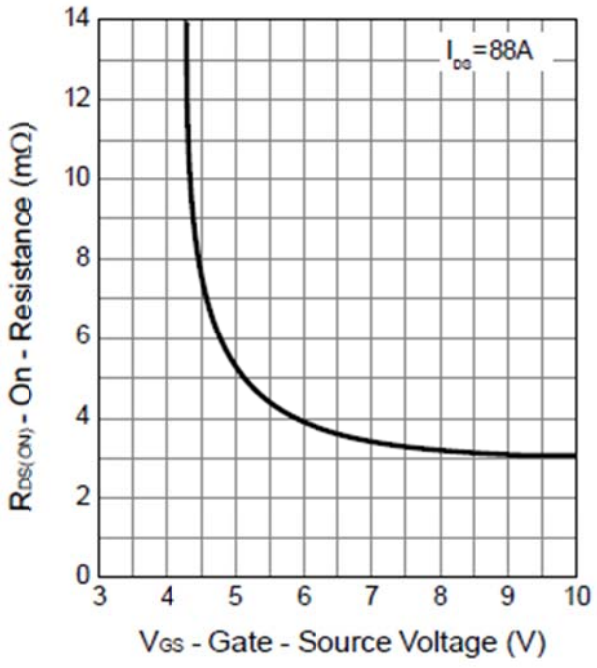
Output Characteristics



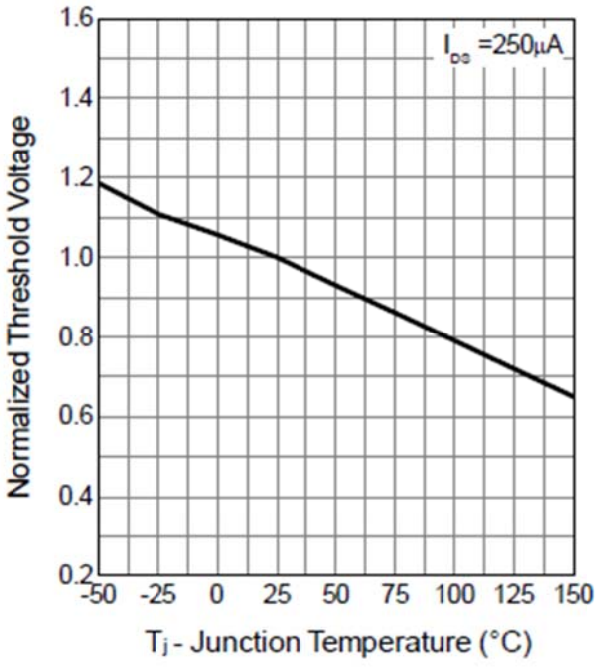
Drain-Source On Resistance



Gate-Source On Resistance

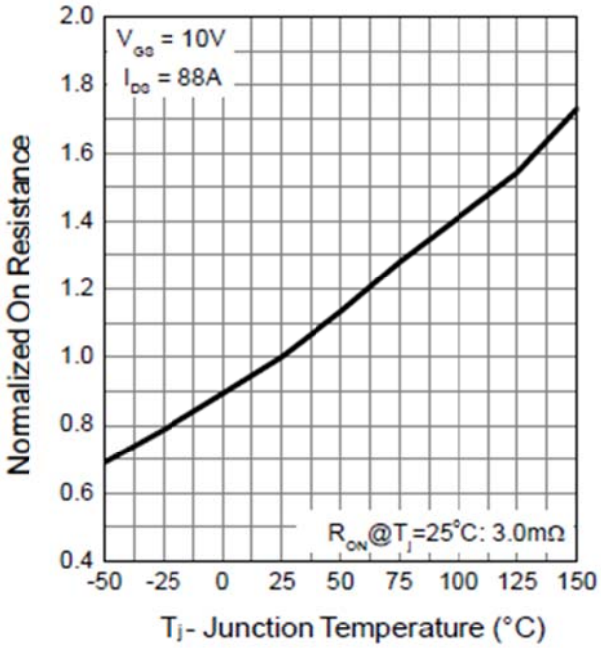


Gate Threshold Voltage

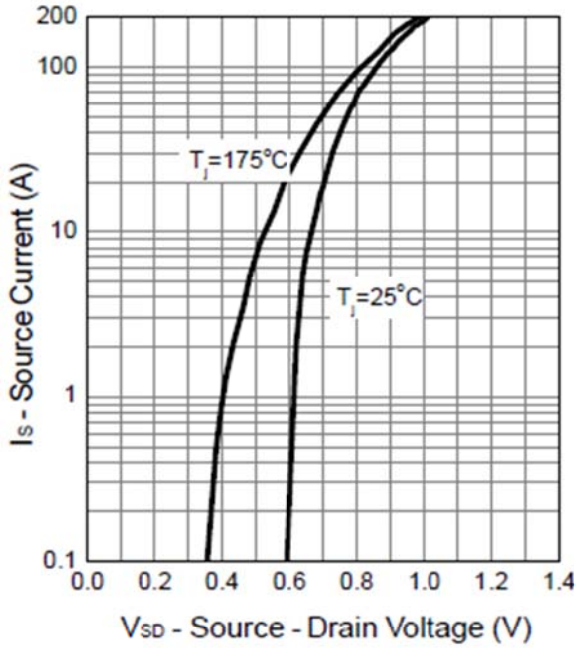


Typical Operating Characteristics

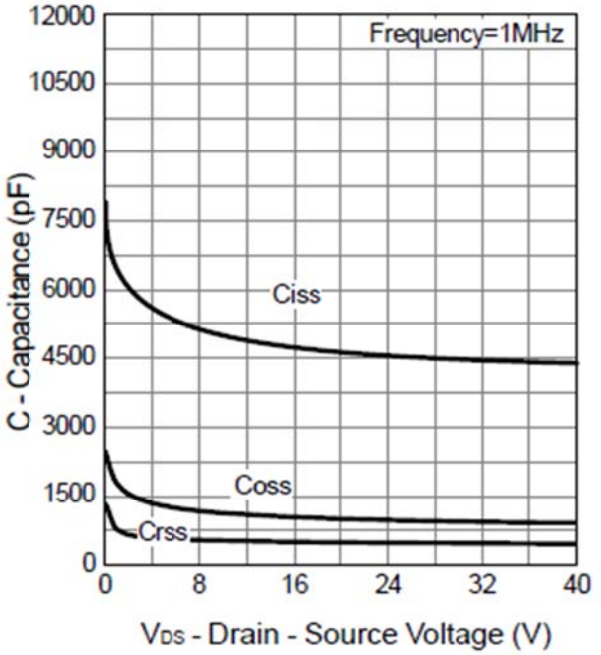
Drain-Source On Resistance



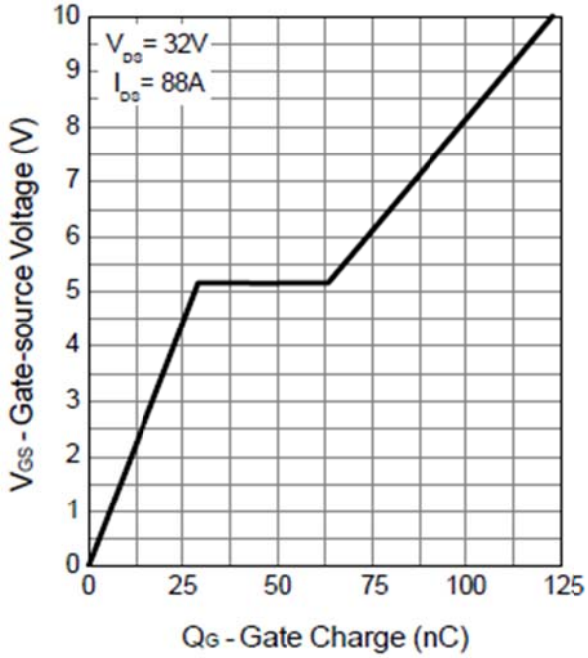
Source-Drain Diode Forward



Capacitance



Gate Charge



Typical Operating Characteristics