freescale
飞思卡尔(深圳)功率半导体有限公司

SUD45P03-10

P-Channel 30-V (D-S), MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[a]
- 30	0.010 at V_{GS} = - 10 V	- 15
	0.018 at V_{GS} = - 4.5 V	- 12

FEATURES

- TrenchFET® Power MOSFETs

RoHS COMPLIANT

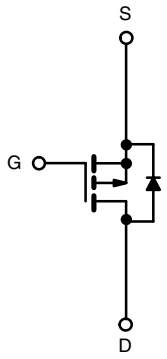
TO-252

Drain Connected to Tab

G D S

Top View

Ordering Information: SUD45P03-10-E3 (Lead (Pb)-free)



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	- 30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current[b]	T_A = 25 °C	I_D	- 15	A
	T_A = 100 °C		- 8	
Pulsed Drain Current		I_{DM}	- 100	
Continuous Source Current (Diode Conduction)		I_S	- 15	
Maximum Power Dissipation[b]	T_C = 25 °C	P_D	70	W
	T_A = 25 °C		4[b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS				
Parameter	**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[b]	R_{thJA}		30	°C/W
Maximum Junction-to-Case	R_{thJC}		1.8	

Notes:

a. Calculated Rating for T_A = 25 °C, for comparison purposes only. This cannot be used as continuous rating (see Absolute Maximum Ratings and Typical Characteristics).

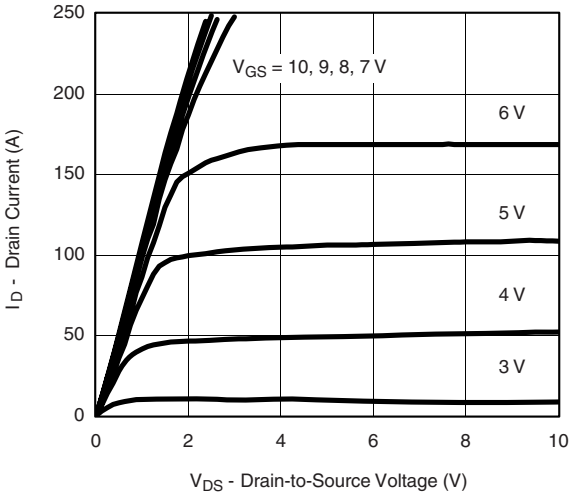
b. Surface Mounted on FR4 board, t ≤ 10 s.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 250 µA	- 30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1.0		- 3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 30 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 30 V, V_{GS} = 0 V, T_J = 125 °C			- 50	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = - 5 V, V_{GS} = - 10 V	- 50			A
		V_{DS} = - 5 V, V_{GS} = - 4.5 V	- 20			
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 15 A			0.010	Ω
		V_{GS} = - 10 V, I_D = - 15 A, T_J = 125 °C			0.015	
		V_{GS} = - 4.5 V, I_D = - 15 A			0.018	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 15 A	20			S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = - 25 V, f = 1 MHz		6000		pF
Output Capacitance	C_{oss}			1100		
Reverse Transfer Capacitance	C_{rss}			700		
Total Gate Charge[c]	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V, I_D = - 45 A		90	150	nC
Gate-Source Charge[c]	Q_{gs}			20		
Gate-Drain Charge[c]	Q_{gd}			16		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 0.33 Ω $I_D \cong$ - 45 A, V_{GEN} = - 10 V, R_G = 2.4 Ω		15	25	ns
Rise Time[c]	t_r			375	550	
Turn-Off Delay Time[c]	$t_{d(off)}$			100	200	
Fall Time[c]	t_f			140	250	
Source-Drain Diode Ratings and Characteristic T_C = 25 °C						
Pulsed Current	I_{SM}				100	A
Diode Forward Voltage[a]	V_{SD}	I_F = - 45 A, V_{GS} = 0 V		1.0	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	I_F = - 45 A, dI/dt = 100 A/µs		55	100	ns

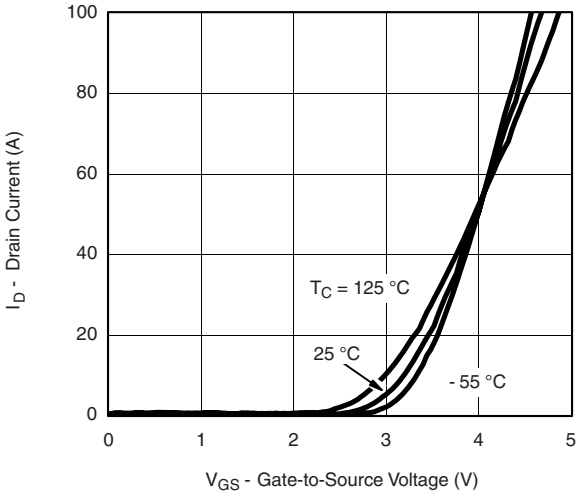
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

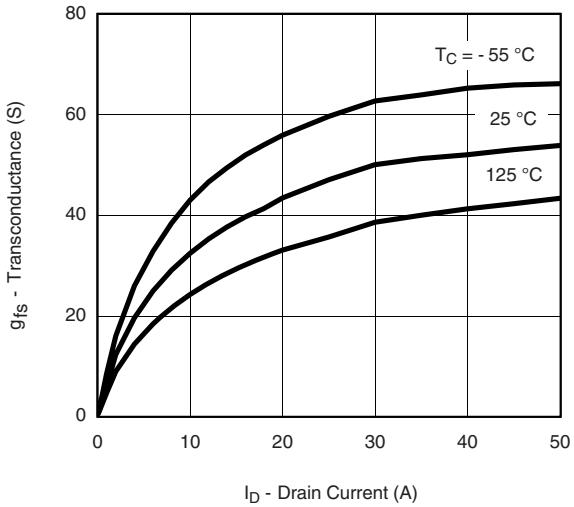
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



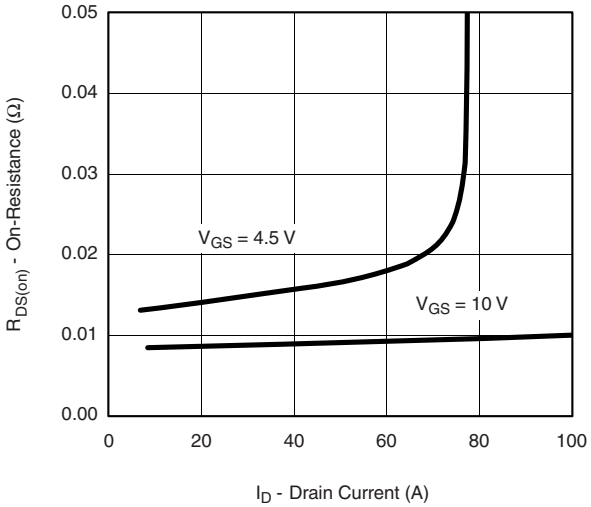
Output Characteristics



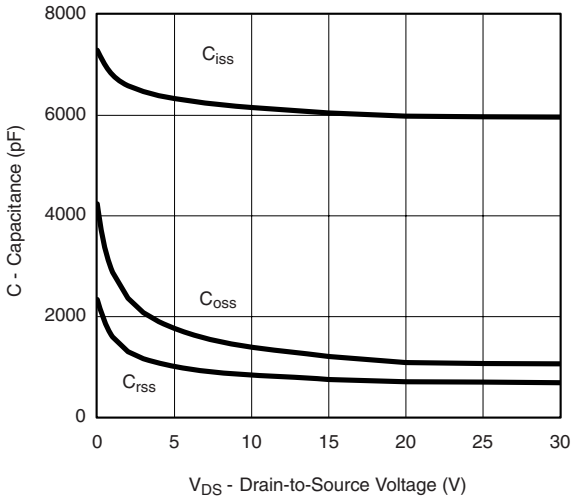
Transfer Characteristics



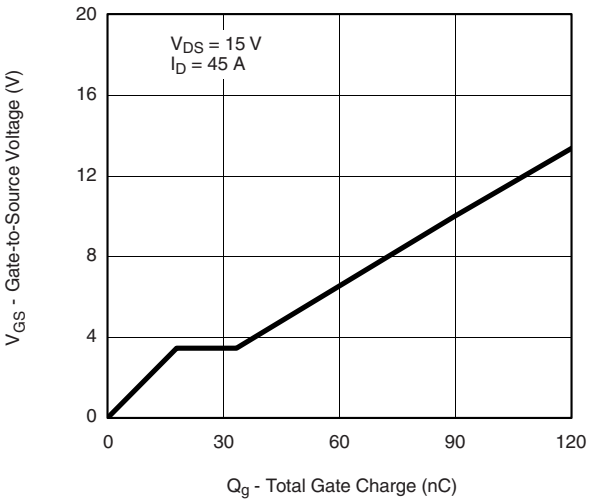
Transconductance



On-Resistance vs. Drain Current

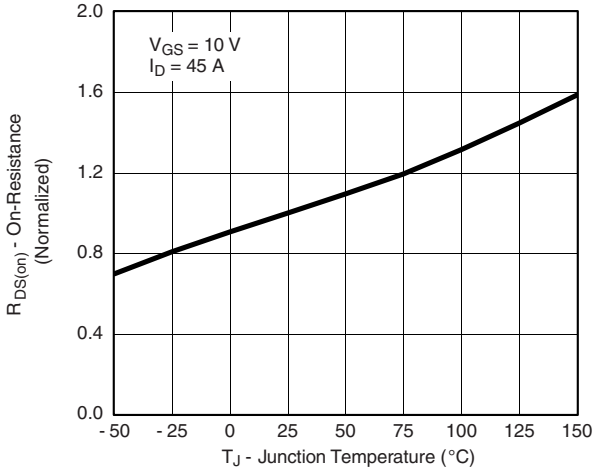


Capacitance

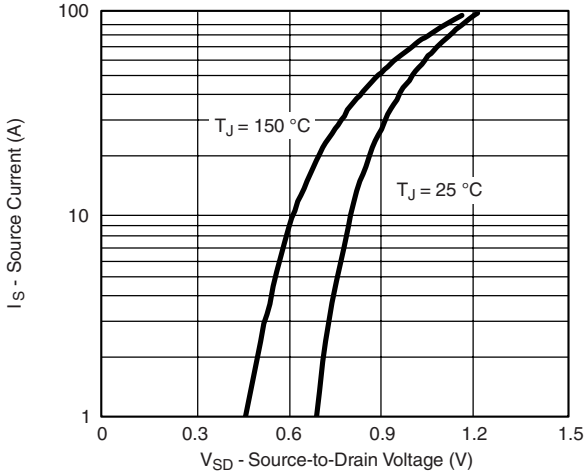


Gate Charge

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

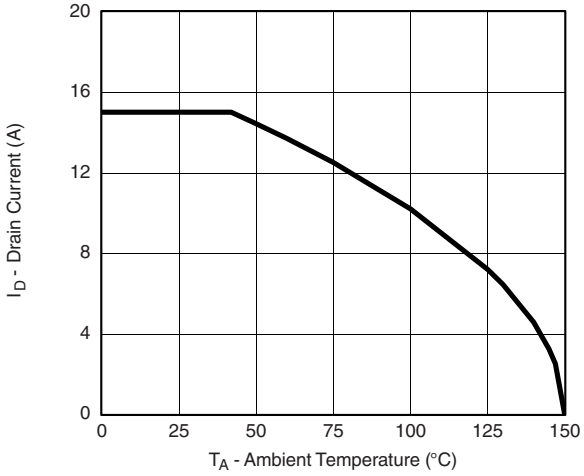


On-Resistance vs. Junction Temperature

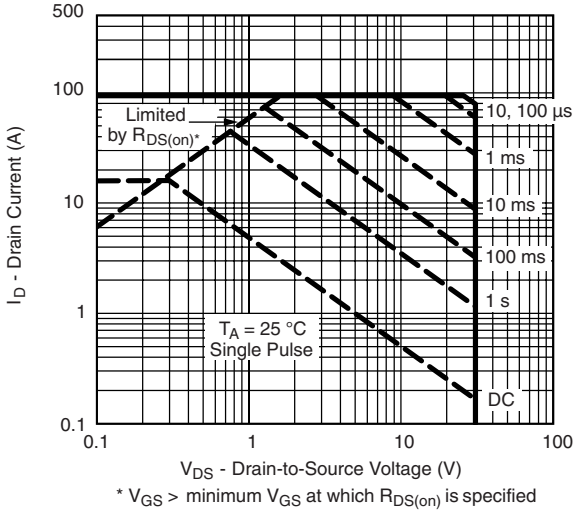


Source-Drain Diode Forward Voltage

THERMAL RATINGS

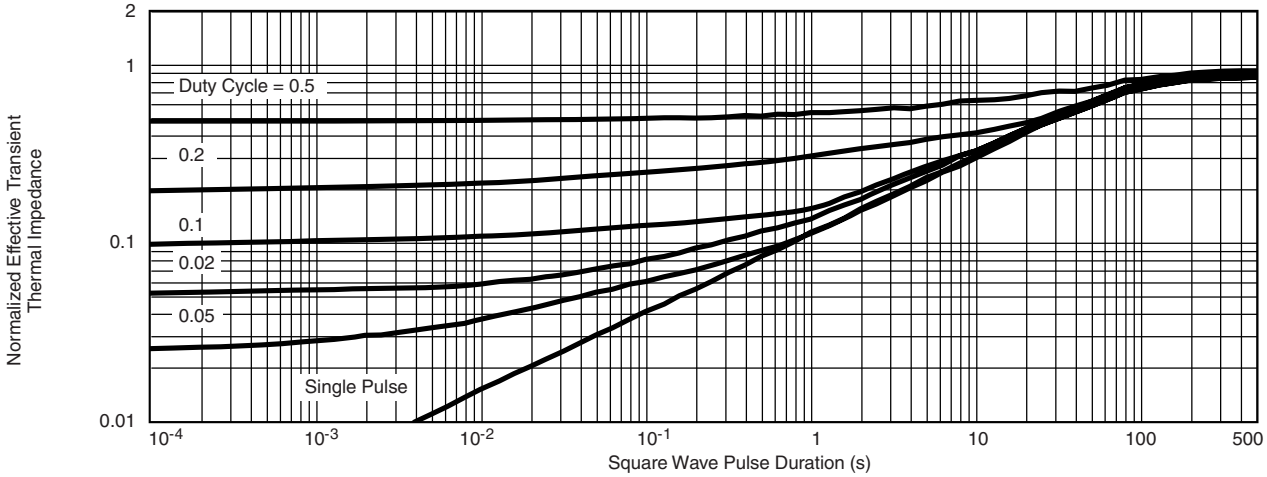


Maximum Drain Current vs. Ambient Temperature



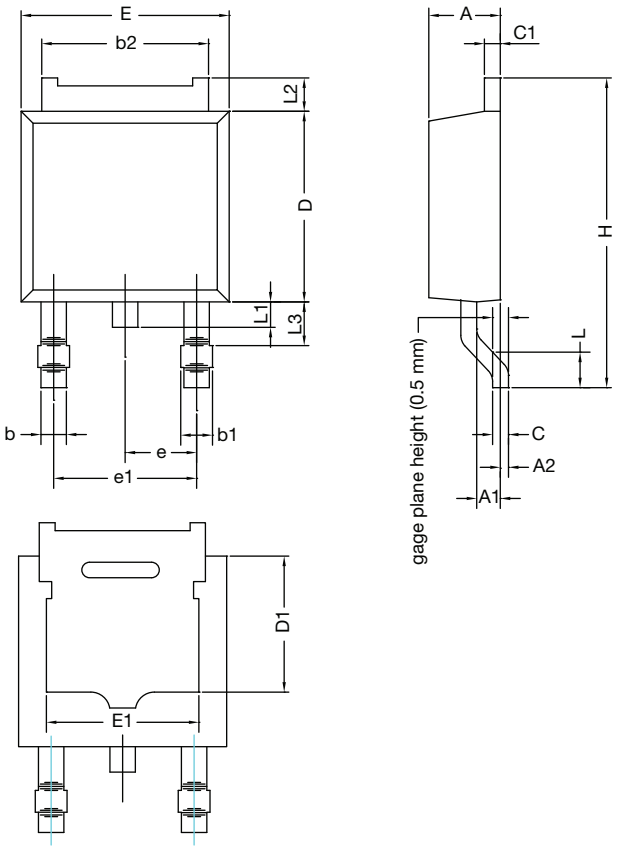
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

TO-252AA CASE OUTLINE

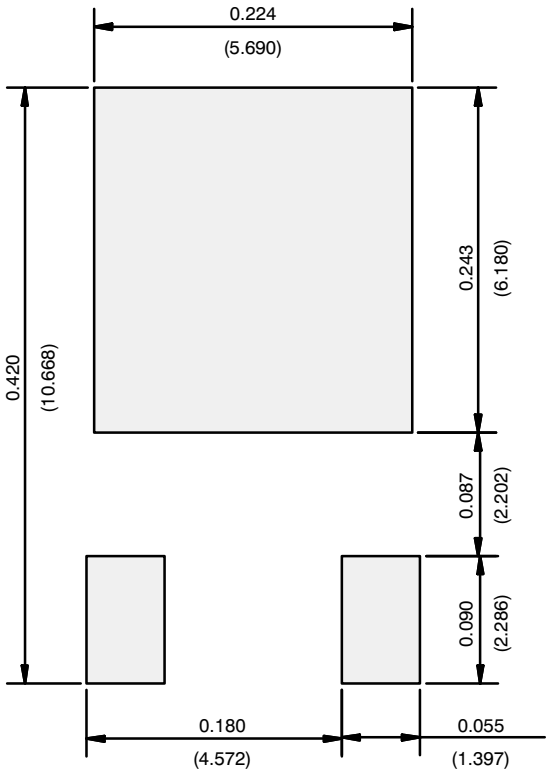


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.21	2.38	0.087	0.094
A1	0.89	1.14	0.035	0.045
A2	0.030	0.127	0.001	0.005
b	0.71	0.88	0.028	0.035
b1	0.76	1.14	0.030	0.045
b2	5.23	5.44	0.206	0.214
C	0.46	0.58	0.018	0.023
C1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
D1	4.10	4.45	0.161	0.175
E	6.48	6.73	0.255	0.265
E1	4.49	5.50	0.177	0.217
e	2.28 BSC		0.090 BSC	
e1	4.57 BSC		0.180 BSC	
H	9.65	10.41	0.380	0.410
L	1.40	1.78	0.055	0.070
L1	0.64	1.02	0.025	0.040
L2	0.89	1.27	0.035	0.050
L3	1.15	1.52	0.040	0.060
ECN: T11-0110-Rev. L, 18-Apr-11 DWG: 5347				

Note

- Dimension L3 is for reference only.

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

Return to Index

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.
freestyle Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on it s or their behalf (collectively, “freestyle”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.
freestyle makes no warranty, representation or guarantee regarding the suitabilit y of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vi shay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation specia l, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
Statements regarding the suitability of products for certain type s of applications are based on freestyle’s knowledge of typical requirements that are often placed on freestyle products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsib ility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specification s may vary in different applications an d performance may vary over time. All operating parameters, including typical pa rameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify freestyle’s terms and conditions of purchase, including but not limited to the warranty expressed therein.
Except as expressly indicated in writing, freestyle products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the freestyle product could result in personal injury or death. Customers using or selling freestyle products not expressly indicated for use in such applications do so at their own risk and agr ee to fully indemnify and hold freestyle and its distributors harmless from and against an y and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vis hay

Material Category Policy

freestyle Intertechnology, Inc. hereby certi fies that all its products that are id entified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwis e specified as non-compliant.
Please note that some freestyle documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002 /95/EC conform to Directive 2011/65/EU.